

# **SCANNER**

JANUARY 2010 - VOLUME THREE - ISSUE ONE

**EMPLOYEES MEET DAILY  
COMPLIANCE RESPONSIBILITIES**

**INVENTORY PROGRAM  
IMPROVES EFFICIENCY**

**FUTURE POWER SUPPLY  
OPTIONS STUDIED**



**SOUTH  
MISSISSIPPI  
ELECTRIC**

POWER ASSOCIATION

# SCANNER

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## TABLE OF CONTENTS

CEO Column - "Building for the Future"	01
Employees Fulfill Environmental Compliance Responsibilities	02
Inventory Reorganization Improves Efficiency and Economics	04
Study Shows Future Power Supply Options are Wide and Varied	06
Budget Requirements are Lower for 2010	08
Focus on Substation Design and Construction	09
New Employees	11
Safety Culture is a 24/7 Thing	12

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 Editor: Kurt Brautigam, APR  
 Communications Coordinator: Nicole Ruhnke

Cover photo: Plant Morrow's blowdown pond protects the water quality of nearby Black Creek

## BUILDING FOR THE FUTURE



**Jim Compton,**  
General Manager/CEO

Last January I wrote that the next five years would be extremely challenging in the electric industry. Certainly this past year validates that statement. While Congress has slowed down on cap-and-trade legislation, the Environmental Protection Agency (EPA) is moving forward in its efforts to regulate carbon under the Clean Air Act. The EPA is also aggressively challenging coal mining permits for surface removal and considering steps to regulate fly ash from coal plants. These actions will further impact the economics of traditional coal-fired generation.

In addition to regulatory and political challenges, we also face economic recession, high unemployment, and a generally gloomy outlook for the future. It is difficult today to believe that there will be robust economic recovery in the near term. But we do have reason to be thankful for some measure of economic growth in our Members' service territories, and we anticipate better growth in the future.

In this *Scanner* is an article about substation design. It details a series of engineering projects triggered by the Koch Foods processing plant, which located on Southern Pine EPA's system in 2004 and expanded in 2007. Southern Pine has been very committed to – and successful in – economic development. The Koch Foods facility has more than 240 employees and represents a capital investment of more than \$43 million, as well as \$3.4 million in annual revenue in electric sales. Among the company's food products for institutional, commercial and consumer markets, Koch provides all of the chicken breast and chicken nugget needs of Applebee's restaurants nationwide and also provides a market for many chicken growers in our service area.

Koch Foods is the kind of development that we need in Mississippi to maintain employment and economic viability. Bringing new economic development projects – as well as expanding existing facilities and operations – requires the efforts of talented professionals who continuously work to match the needs of prospective companies and facilities. Whenever possible, we assist the economic development teams at Statewide and the Mississippi Development Authority in their efforts.

Such developments, however, require that we make investments in generation and transmission facilities. Serving large industrial loads does not just happen. We must take steps to ensure that we maintain the capacity to serve present and future economic development projects. Those steps require long-term planning, construction, and financing. We have to commit to staying ahead of future needs.

Another story in this *Scanner* takes a look at the process involved with determining future generation options. Our ongoing studies related to future power requirements and how best to meet our Members' needs seem to change yearly; but without such planning and decision-making, those distribution systems would not be able to fulfill their mission. This year, as we break ground on the Moselle Repower Project, we will continue to consider how Mississippi Power's Kemper County IGCC project might fit into the puzzle, as well as determining what other options may be available to meet our growing needs.

Despite the current economic downturn, we are seeing expansion of electrical requirements at existing facilities, such as Denbury and Southern Pines Energy Center, and very likely at several new projects also. Our Members continue to be active in seeking new development that will attract capital investment and much needed jobs. While investment has dramatically slowed or stopped in other sectors, we continue to invest in generation and transmission upgrades so that we will have the capacity to serve new and expanded industries.

We believe, as does Governor Haley Barbour, that in the not-so-distant future, readily available electric capacity to serve new industry will be limited in many areas. We need to be open for business here in Mississippi and ready to serve new and existing demand with reliable, affordable power. For these reasons, we continue to plan, build, and prepare for a better, more prosperous future in Mississippi.

02

04

09

12

## All Employees Contribute to Environmental Compliance

Knowing and complying with all environmental and regulatory requirements are daily responsibilities for each employee of South Mississippi Electric. Tremendous strides are being taken across the Association to maintain a culture of compliance for all requirements that ultimately affect each aspect of the organization's operations.

"Environmental compliance has become an important business function across the electric utility industry," said Joey Ward, environmental affairs and fuels director. "The Board of Directors and employees of South Mississippi Electric have embraced the same responsibilities to maintain full compliance with all regulations and standards."

The entire environmental group – including Ward, Hank Sossaman, environmental data coordinator; Rod Rogers, results engineer at Plant Morrow; and Alex Howard, results engineer at Plant Moselle – meets regularly to discuss the status of federal environmental regulations. Due to the nature of the issues, federal regulations change often, as do the detailed reporting requirements associated with the regulations.

"All of us have a responsibility to keep each other informed," Ward said. "As the regulations change, we all must work together to plan and carry out compliance efforts. We receive a daily copy of the Federal Register, an archive of all federal changes. These, along with updates from NRECA, allow us to stay current on changes and additions issued by the federal government on standards that are relevant to our compliance standards."

Howard and Rogers work with each section at their respective plants to gather the environmental data required by state and national agencies, including Environmental Protection Agency (EPA), Mississippi Department of Environmental Quality (MDEQ), Rural Utilities Service (RUS), U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and Mississippi Department of Archives and History. SME's environmental requirements include air and water control, solid and hazardous waste disposal, and oil spill protection.

*Black Creek, which overflowed its banks after December rains, is monitored and protected by Plant Morrow employees*

For air quality control, the plants follow guidelines outlined in Title V of the Clean Air Act. According to the EPA website, the goal of the operating permit program is to streamline air pollution regulations by consolidating all air pollution control requirements into a single, comprehensive "operating permit" that covers all aspects of a source's year-to-year air pollution activities. Title V permits must be renewed every five years.

Solid wastes from Plant Morrow include any by-product from the combustion of coal – fly ash, bottom ash, and scrubber by-products. Procedures are also in place there for waste disposal, including household items, industrial items (used oil, paint, cleaning supplies, etc.), occasional radioactive waste, electronic devices, and other items.

"Properly disposing of wastes requires some investigation and thought," said Rogers. "The key is to choose materials from the beginning that will minimize the plant's hazardous wastes. We have procedures in place for disposal of most items, and employees usually ask someone before disposing of questionable items. Employees also receive updates on proper waste disposal."

Other requirements for the plants include water discharge permits, storm water pollution prevention, spill prevention, and wetlands management. Plant Moselle is also responsible for all operation and compliance efforts at Sylvarena, Silver Creek, Benndale, and Paulding.

Additionally, Plant Morrow must meet requirements related to the landfill and the cooling tower blowdown pond dam, which is considered a high-hazard dam by the MDEQ due to its close proximity to Black Creek.

The cooling tower blowdown pond dam is regulated per the Mississippi Rules for Dams. Water from the cooling towers, as well as water from other plant sources flow to the blowdown pond, where it is monitored as per the National Pollution Discharge Elimination System (NPDES) permit, before being discharged into the Black Creek. Black Creek eventually empties into the Pascagoula River in northern Jackson County.

Howard and Rogers compile environmental data into several reports that are sent to Sossaman, who is responsible for formatting the reports for submission to the environmental regulatory agencies.

"Environmental reporting requirements vary with each aspect of our compliance responsibilities," said Sossaman. "Some standards require monthly reports, while other reports are submitted only every six months. The process is continuous, and there is a lot of data to manage; but with cooperation from each facility, we are able to stay ahead of the curve."

The EPA recently announced that six greenhouse gases – including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride – pose a danger to the environment and the health of Americans, and that the agency would start drawing up regulations to reduce those emissions.

The Clean Air Act set low thresholds for regulation that opponents argue would require rules for everything from laundries to office buildings, from cow farms to coal plants. But the EPA said it would impose new rules only on large factories, refineries, power plants and other facilities emitting more than 25,000 tons a year of carbon dioxide.

"Emissions monitoring is one of the largest environmental efforts that we have," said Howard. "We already measure and record CO<sub>2</sub> emissions with our current emissions monitoring systems. The EPA has provided emissions factors to calculate for the remaining gases. We will continue to accurately monitor our emissions and make the appropriate plans to meet any new regulations that are headed our way."

Another environmental issue that appears to be coming in the near future will be the EPA's review of waste water discharge guidelines. As power plants add controls for air pollution, the EPA is mindful that what may be taken from the air could end up in the waste water discharge.

"This issue is something that will affect us eventually," said Howard. "As with any new or modified regulation, we will continue to meet the standards that are currently in place, knowing that additional requirements can be expected in the near future."

To involve employees in environmental compliance, the environmental affairs group has begun implementing "Take 2" into monthly safety meetings. The results engineers at the plants are given a few minutes in each meeting to highlight environmental issues and to discuss the environmental effects associated with any upcoming projects.

"The Take 2 program is new," said Rogers, "and we expect it to be an effective way to keep the employees informed of plant environmental issues. We also encourage the employees to take two minutes before performing a task to consider the environmental effects associated with that task. Environmental compliance is complex, so we are doing what we can to educate employees on its importance in every aspect of what they do."

"The corporate emphasis on environmental compliance has resulted in a more systematic and coordinated effort across the Association," said Ward. "The environmental affairs group is taking the necessary steps to ensure complete compliance at all of South Mississippi Electric's facilities."

*A system of reeds and cattails naturally filters any water run-off from the fly ash landfill before it enters Black Creek*

# Inventory Affects Efficiency and Economics

The Supply Chain Team works year-round to ensure that materials and equipment are readily available for all the projects at hand – a task that requires cooperation from employees across the Association. The Supply Chain Team includes Allen Keene, supply chain manager; Jan Holder, supply chain management analyst; Tony Tisdale, shipping and receiving clerk; Buyers Kelly Johnson and Tony Williams; and Storekeepers Winford Cole, Allen Moree, Sammy Odom, Prentiss Newman, and Kyle Aultman.

In 2003, the team undertook a data conversion from the old Legacy database to the Maximo system. The conversion was very aggressive and resulted in an unavoidable loss of some information related to items and manufacturers. Another conversion took place in 2008 – from Maximo to the Oracle Enterprise Business Suite (EBS) – and other data was not able to be transferred. For the past year, the team has been working diligently to complete the database and standardize the formats used by SME's different warehouses (Plant Morrow, Plant Moselle, FOC, and the vehicle maintenance shops). The goal is to compile the manufacturer and part numbers for each inventory item, along with adding manufacturer specs and drawings to the EBS database.

“Our database had become a growing problem because of the inconsistencies and non-standardized business processes,” Holder said. “We are adding as much and as detailed information as we can to keep the process as consistent and reliable as possible. We will begin addressing the necessary patch releases that correct problems in the software functionality in the first quarter of this year to determine when to install the latest releases. This effort will require extensive testing and coordination among all users and the Business Information Systems group.”

In addition to standardizing the inventory database and process, the warehouses have undergone their own internal reorganizations – from item locations in the warehouses to categorization and labeling. Each item belongs to a specific bin location within the warehouses that makes the process of locating the item quick and easy.

The warehouse at Plant Morrow has experienced significant challenges over the past year. Due to the large quantity of items stored there and the high turnover rate of those items, the task of putting the warehouse in order and organizing data has been an ongoing one. The plant completed its first full outage (both units shut down) in more than ten years in October, creating a need for inventory items and data that were not readily available.

“Winford Cole and Allen Moree at Plant Morrow worked very hard to research old databases in order to locate the necessary information,” Holder said. “A huge amount of inventory passed through the warehouse during that time, and the end result was a success. The outage forced us to tackle some of the toughest challenges in our efforts to standardize data.”

“Several items that were needed for the outage had not been used in many years,” Moree said, “but we stayed on top of things and were able to find the information that we needed for the materials that were requested. We

received a lot of assistance from the crews here at the plant when it came to identifying part numbers for the specific inventory items.”

“We manage over six thousand line items in the Morrow warehouse,” said Cole. “That is a value of more than five million dollars. The system we are working with now has definitely helped the process become more standardized. It is an ongoing process to track down the manufacturer and part numbers for each item, but we are making great strides.”

Sammy Odom has worked in supply chain for several years. After the construction of the new warehouses at Plant Moselle and the FOC in 2007, Odom joined the Plant Moselle staff. “I have seen many changes in the inventory process during my time at South Mississippi Electric,” said Odom. “The obvious change has been the transition from handwritten orders to the computerized systems. Oracle EBS has caused us to standardize our procedures and keep much better records of orders, shipments, and receiving reports. The software provides all of the information that we need in a centralized location, rather than having to dig through paperwork to find what we are looking for.”

Along with reorganizing the warehouses, the Supply Chain Team also considered the shelf life of several items and determined that certain items should be stored in climate-controlled facilities. At Plant Moselle, items such as computer cards, electrical boards, and various wood materials were moved into available climate-controlled rooms.

“The better care we can take of our materials, the longer they will last,” said Odom. “As a team, we try to make wise decisions regarding each item in inventory, including improving their quality and extending their shelf life. It is all part of making the system work as best as possible.”

With the completion of the FOC, inventory materials for headquarters and transmissions projects were moved into the new 20,000-square-foot warehouse. The move involved compiling materials from several different locations (Plant Moselle, Headquarters, and off-site climate-controlled storage facilities).

“Our warehouses operate on basic supply-and-demand principles,” said Prentiss Newman, storekeeper at the FOC. “As materials are requested through work orders and taken out of inventory, items are reordered based on upcoming projects and the item's lead time for delivery. Maintaining inventory requires a good bit of juggling – lead times, project delays, and transmission emergencies all affect the balance of inventory in the warehouse.”

Transmission Construction and Maintenance Planner Tracy Stiglets is responsible for working with planning and design engineers on the preliminary list of materials needed for each line project and entering a work order into EBS.

“Many of the project details – such as pole dimensions and bolt shape – are not specified in the preliminary project description,” Stiglets said, “and many

of the details cannot be determined until later in the project process – creating several unknowns. Although this can sometimes result in excess materials being reserved in the warehouse, because of the nature of our projects and the overlap of many of the items, the materials will eventually be taken from inventory and used.”

Because of the many variables associated with ordering and maintaining materials, maximum and minimum levels are determined for each inventory item. Once an item moves through the work order process, a reorder is triggered if the minimum level has been reached.

Shipping and Receiving Clerk Tony Tisdale inspects and receives everything that comes through the FOC – including items for the Headquarters facility. “I go through each package and compare the items received with the items that were ordered,” Tisdale said. “Many times, depending on the size of an order, it might require several shipments before it is complete.”

Along with providing materials for new construction projects, Newman and Storekeeper Kyle Aultman work with the various crews on routine maintenance and repair projects.

“Each department – including substation maintenance, relay, metering, communications, transmission, and the others – relies on the warehouse for materials,” Newman said. “The Oracle system works well for ensuring that the materials are on hand when the projects begin. As designs change and decisions change, challenges inevitably arise; but at the end of the day we all work together to get the jobs done.”

At the end of each calendar year, the Supply Chain Team completes an internal audit with Michael Barnes, internal auditor, and Mike McCrary, director of business information systems and advisory services. Holder coordinates cut-off dates for receiving materials and schedules the inventory assessments at each warehouse location. Every inventory item is physically counted and compared to the count sheets from the EBS database. Any variances are reconciled and adjustments are made accordingly.

“The inventory process has greatly improved over the years,” said Allen Keene, supply chain manager. “We recently completed the 2009 internal audit and noticed a considerable reduction in the effort required to get through the project. Employee cooperation across the Association can be credited for that major improvement in the inventory process.”

Standards Committees have been created at each facility to further aid in the inventory process. The committees consist of approximately six employees from various departments who work together to approve new inventory items and manufacturers, and to also designate obsolete items.

“The Standards Committees work very hard to identify new inventory items based on Inventory Change Requests that are submitted by employees,” said Keene. “The diverse make-up of the committees offers a wider view of issues and needs associated with materials, which is important to making wise purchasing decisions. The formation of the committees is fairly new, but we have already seen the value of having employees outside the Supply Chain Team helping to make inventory decisions.

“The importance of inventory touches every maintenance function of the Association,” Keene added, “and the Supply Chain Team is taking great steps to continually improve our system. The Standards Committees are a new addition that has proven to be very effective in standardizing the business processes that are required. To us, a successful inventory system keeps the plants running, the lines in the air, and the substations energized. At the end of the day, we work to ensure that no project is put on hold due to lack of materials.”

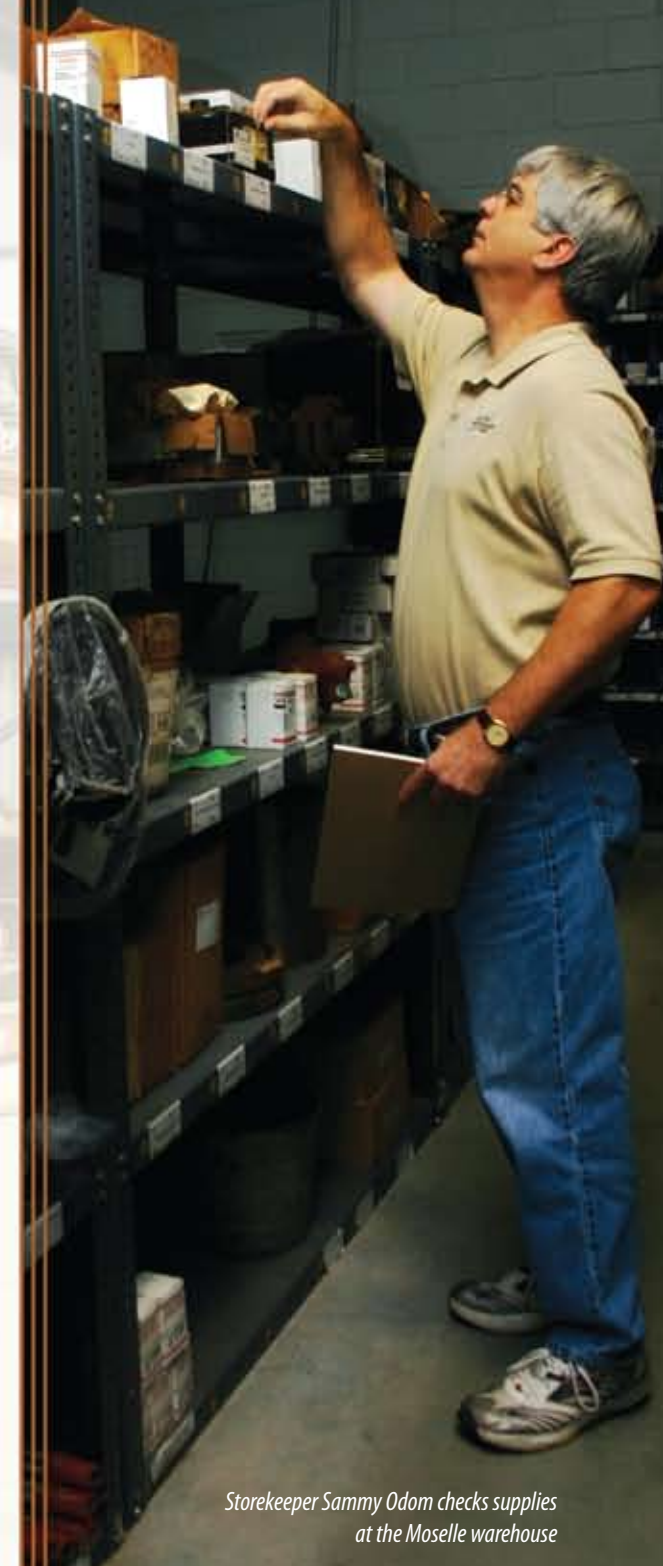
## INVENTORY AT EACH WAREHOUSE LOCATION

**MORROW – \$5,019,766.17 (6371 line items)**

**FOC – \$5,359,861.68 (2083 line items)**

**MOSELLE – \$1,364,001.30 (1549 line items)**

**VEHICLE SHOP – \$123,134.13 (186 line items)**



*Storekeeper Sammy Odom checks supplies at the Moselle warehouse*

# Power Supply Planning is an Ongoing Process

“We have been fortunate over the years to have used power purchases to meet a significant portion of our generation needs. Going forward, however, we believe it is important to have more control over our own resources. We will always rely to some degree on outside resources – all utilities do – but we know the Association will have to build new resources in upcoming years to have the ability to control our destiny.”

The most recent PSOS analysis confirmed what has been known for some time – that SME will need new generation resources sometime around 2015. That will be in addition to the projects that are already underway, including the Moselle Repower Project, which will add 150MW to the fleet in 2012, and the Grand Gulf Uprate Project, which will add approximately 18MW in the same timeframe.

Any new carbon regulations that might be passed by Congress make the future for coal units difficult to predict. With few new coal-fired plants being built in the region – Plum Point, which will provide SME with 200 MW when it begins operations later this year, being an exception – natural gas-fired resources seem to be the most viable near-term option.

“The study indicates that the current trend in the region is toward gas-fired facilities,” said System Planning Manager Alan Wilson, who supervised the study. “Coal gasification technology is improving and the predictions call for more gas to be produced in the U.S. and Canada for the upcoming years. Of course, committing to natural gas units, especially for meeting base load and intermediate needs, means accepting exposure to the volatility of fuel costs.”

“Whether we build gas units to own and operate ourselves or plan to purchase gas-fired generation through power purchase agreements or from the open market, some portion of our future generation will have to be met with natural gas. What we would like to do, if possible, is continue to develop a variety of resources that retain our fuel flexibility. But between now and 2027, we will need to add nearly 1,000MW of generation resources, so without question some portion of that will be gas-fired.”

One factor that might reduce or slow the need for new resources slightly is to find ways to reduce or manage demand at the consumer level. The PSOS indicates that the need for new generation might be pushed back by a year or two if effective demand management programs are established. Efforts are underway now to determine cost-effective options that would be acceptable to and effective for residential consumers, as well as for industrial and commercial facilities.

Meeting demand. Maintaining a 15% reserve margin. Potential carbon legislation. Unpredictable fuel markets. Heat rate comparisons and capacity factors. Buying power from the grid. Possible renewable portfolio standards.

These and many other considerations are always a part of future planning for any electric power provider. Predicting the future is never an easy task, but it is vital to understand all available options in order to continue meeting consumer demand with economical and reliable generating resources.

South Mississippi Electric commissions a Power Supply Options Study (PSOS) approximately every eighteen months to two years to assist with long range resource strategy and planning. Unlike some utilities that have seen consumer loads decline within their service areas, SME’s Members are projecting increases in peak demand and overall usage. While the rate of growth for some Members has slowed somewhat over the past two years, the combined system load for all Members continues to increase by about two percent annually.

“Determining when and how to add new generation involves hundreds of variables,” said Steve McElhane, operations and planning director. “Predicting our load growth and subsequent generation needs is the first step, and we do that annually with our power requirements study. Once we have those projections, we begin to examine how much additional capacity we will need in a given timeframe and look at possible resources and costs to meet that load.”

The study used computer models to look at literally hundreds of scenarios to determine possible power supply options. The costs of constructing different types of facilities, as well as long term operational costs, were primary considerations.

“We continually look for the most economical options, but there are so many variables and assumptions associated with trying to make those determinations,” McElhane said. “We are looking for long term solutions. As it turned out, the Kemper County IGCC project was not an option for SMEPA at the time the study began, so it was not included. This may be a viable option, however, because over the life of the plant the low fuel costs help to balance out the high construction costs.”

The PSOS did include options ranging from nuclear and coal to natural gas and renewables, as well as the effects that demand-side measures might have on reducing load. Results suggested that under all the scenarios that were considered, a combination of new gas-fired resources is the best fit for SME’s future capacity and energy needs. It projects that the Association will need to add two to three 330MW combined cycle facilities over the next fifteen years, which will require finding sites as well as financing.

Meeting any new federal or state requirements to use renewable resources will undoubtedly create additional costs. The study determined that in order for SME to have 20% of its generation come from renewables by 2020 – a level included in Congressional discussions – would call for developing significant biomass and solar facilities. With combined-system energy sales of more than ten million MWH by 2020, in order to reach those percentages SME might have to consider developing more than 150 rooftop solar arrays suitable for big box retail stores (more than 100,000 square feet), as well as more than 200MW of biomass facilities.

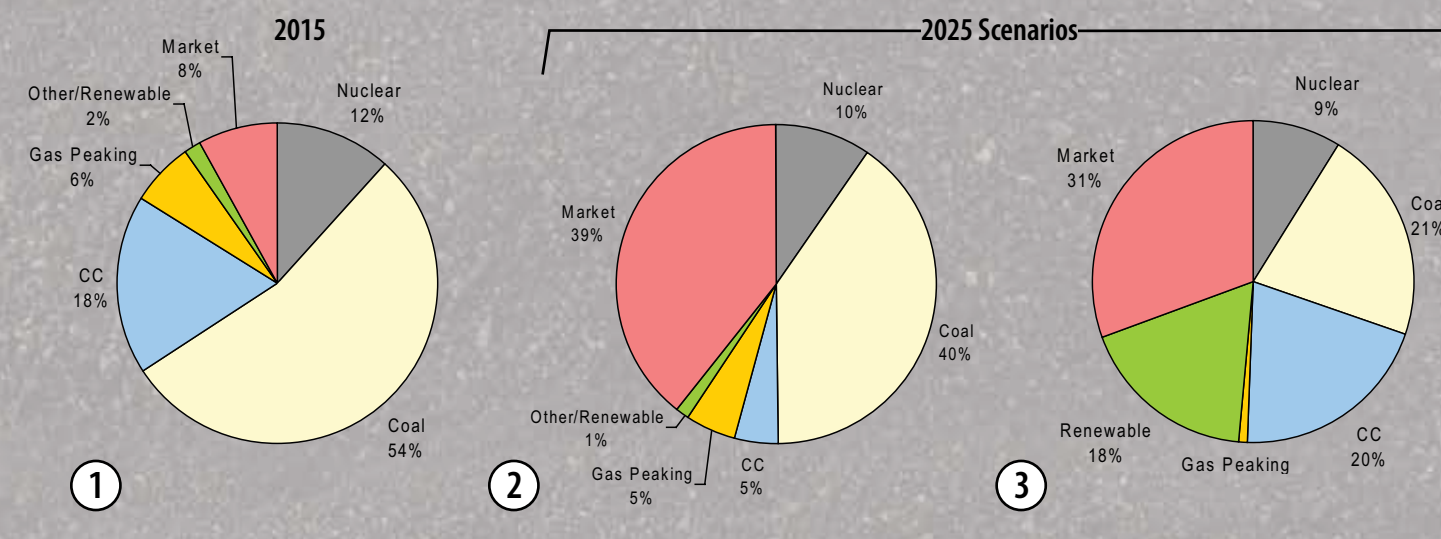
The bottom line is that it will cost several billion dollars over the next twenty years to keep up with load growth, meaning that making the right decisions for the future will continue to be a major component of SME’s mission of providing the South’s best value for safe and reliable energy.

*Editor’s note: The 2009 PSOS was based on the 2007 annual Power Requirements Study (PRS), which was the most recent PRS submitted to and accepted by RUS at the time the PSOS was initiated. More recent PRS projections have indicated slightly lower demand and energy growth on the system, which could be reflections of yearly weather patterns and the recent economic recession. The results of the PSOS are consistent with long-term trends and projections required to plan for SME’s generation needs.*

## LOOKING AHEAD: CHANGING GENERATION OPTIONS

The PSOS provides a look at the expected energy distribution by resource type for the years 2015 and 2025, based on SMEPA’s existing and planned resources and their typical dispatching levels (not based on economic dispatch). Without the addition of any new owned or controlled resources, the study projects that a considerable percentage of energy would be provided by the market in 2025 (charts 1 and 2). In order to minimize the risk of such a large exposure to fluctuating market resources, SMEPA will likely need to add a mix of new base load and/or intermediate resources.

The study also included a scenario for the Association having to meet potential renewables mandates beginning in 2020. Based on construction and fuel cost assumptions for a variety of different resources, including wind, solar, biomass, and efficiency/demand-side management options, the PSOS indicates that overall costs for projected energy distribution for 2025 (chart 3) will be much higher than adding more conventional resources – possibly by as much as \$400 million.



# SME Budget Requirements Lower for 2010

In contrast to the uncertainty and rising costs that confronted the electric industry a year ago, the process of preparing the operating budget for 2010 has been much more positive.

Due to several factors, including declining natural gas costs and lower-than-expected system sales, South Mississippi Electric's 2010 budget, approved by the Board of Directors in December, will require revenue of just over \$745 million. Last year, the 2009 budget forecast was \$813 million, and current year-end projections suggest that overall costs for the year will be closer to \$782 million.

"We finally saw some relief for fuel, purchased power and coal transportation costs in 2009," said Jim Compton, general manager/CEO. "We have been very consistent in maintaining the operating costs that we can control, but fuel and purchased power still account for nearly 75% of our overall budget."

Total fuel and purchased power costs for 2010 are expected to be \$34 million less than what was spent in 2009, with much of the reduction coming from a decrease in fuel charges associated with power purchased from Mississippi Power. Based on the lower budget forecast, the Board reduced rates to Members in December by five mills/kWh, which makes SME's projected annualized cost of power for 2010 – 75.51 mills/kWh – approximately five percent lower than 2009's annualized rate.

"The lower costs we foresee in 2010 are the welcome result of a combination of factors," Compton said. "Natural gas market prices during 2009 were

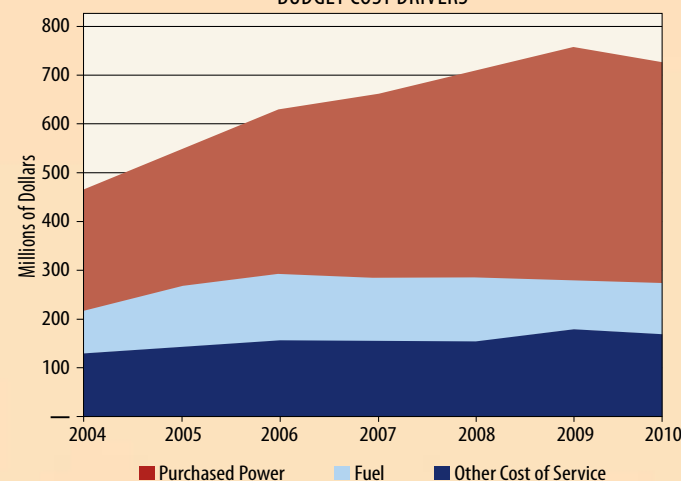
significantly lower than in 2008, which resulted in lower overall costs to operate our gas-fired generating units, as well as in more opportunities to take advantage of output from available, lower-priced purchased power resources. The economic recession also played a role, as overall consumer electric usage was down, providing access to additional available purchased power options at lower costs."

During 2009, SME's system operators were able to take advantage of economical market opportunities to meet system demand (buying power off the grid when less expensive than that available from SME facilities). Purchasing more power from the grid meant that production from Plant Morrow was less than in past years, which reduced environmental compliance costs in 2009. The 2010 forecast also assumes environmental compliance costs will be lower than last year.

The budget reflects projected overall system sales of 9.86 million megawatt hours to Members, slightly more than actual sales in 2009. SME's owned and controlled generation resources – including Batesville, Louisiana Generating LLC, and Plum Point when it is placed in service in August – are projected to account for 58% of generation needs, up from 47% last year. That should also reduce the amount of spot market power purchases the Association will have to rely on in 2010.

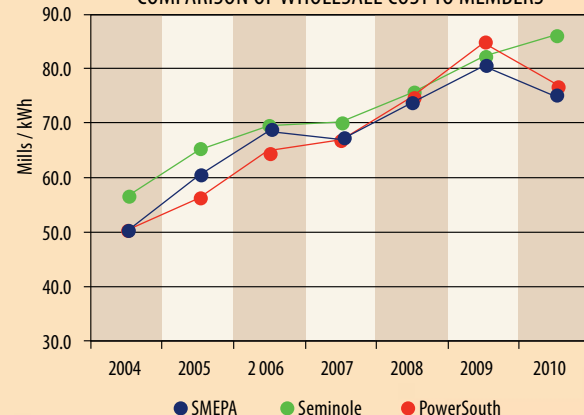
"This is much better news than we were working with at this time last year," Compton noted. "There are still many challenges to face; but after the cost increases we have seen for several years, it is good to be able to reduce rates to our Members for 2010."

BUDGET COST DRIVERS



BUDGET COST DRIVERS (Millions of Dollars)	2004	2005	2006	2007	2008	10-2 Forecast 2009	Proposed Budget 2010
Purchased Power	\$ 245	\$ 279	\$ 336	\$ 375	\$ 432	\$ 462	\$ 441
Fuel	90	127	140	134	132	115	101
Other Cost of Service	126	139	152	150	152	177	176
<b>Total Cost of Electric Service</b>	<b>\$ 461</b>	<b>\$ 545</b>	<b>\$ 628</b>	<b>\$ 659</b>	<b>\$ 716</b>	<b>\$ 754</b>	<b>\$ 718</b>

COMPARISON OF WHOLESALE COST TO MEMBERS



WHOLESALE COST TO MEMBERS (Mills/kWh)	2004	2005	2006	2007	2008	2009	2010
SMEPA	49.8	59.8	68.2	67.1	73.6	79.5	75.6
Seminole	56.2	64.6	68.6	69.2	74.5	81.4	85.4
PowerSouth	50.7	56.5	64.5	66.7	75.1	84.0	77.0

# Substation Design: Much More Than Meets the Eye

South Mississippi Electric has more than 130 transmission substations, switching stations and GOAB (group operated air break) switch locations scattered throughout its vast transmission system, each playing a role in maintaining the reliable flow of electricity to Member delivery points. As each facility is added to the system, it is comprised of a unique combination of equipment and structures designed to meet specific needs. No less than a dozen such facilities are currently in various stages of development, fitting into a five-year plan that constantly evolves to meet the needs determined by Member growth.

The look of a substation is familiar to most of us – steel structures, switches, insulators, circuit breakers, transformers, and a host of state-of-the-art electronic equipment – and that is all above ground. Hidden from view are concrete foundations, conduit, miles of control wires, and a grounding system created with miles of copper wire that help to protect personnel inside the substation. The process of designing and building a station from start to finish may span more than two or three years.

When Moselle's generating units first came on line in the early 1970s and early on-system construction continued, 69kV facilities were used to transmit output to Members. As the transmission system rapidly developed during the decade, with interties to Mississippi Power and MP&L (now Entergy) planned and the commitment made to begin building Plant Morrow, bulk power planners determined that a 161kV loop would help ensure the system's performance.

"Our present 360-mile 161kV transmission backbone supports the 1,000-mile 69kV subtransmission system that serves our Members," said Terry Lee, chief engineering officer. "We continue to add facilities based on work plans that reflect required projects and needs that arise, such as overloading

issues or low voltage problems. Bulk power planners constantly evaluate the system's electrical operations in order to maintain reliability. It is a never-ending process."

The White Oak and Polkville projects currently under construction are a good illustration of why and how facilities are added to SME's transmission systems, as well as what the design process entails. In 2008, Southern Pine EPA built a new delivery point to serve Koch Foods in Scott County. This additional load on the Homewood-to-Martinville 69kV loop caused low voltage issues for certain line outages during peak load times on the 69kV system in the area, creating a need for additional support from the 161kV transmission system. The best solution to the problem: tap the 161kV transmission line in the area (Line 172), and build a new 161kV transmission line to connect with a new 161kV/69kV substation to provide the needed support to the 69kV system in the Polkville area.

The decision was made to tap Line 172 with a switching station in north Smith County near the White Oak community and build the new substation on Mississippi Highway 13 in the town of Polkville. Each facility will be built to easily accommodate future expansion rather than only meeting the immediate needs of the transmission system. The estimated cost for the project is more than \$7 million.

Once the approximate locations of the facilities were determined, it was necessary to find property that allows for access to the transmission lines and has topographical conditions suitable for construction. Aerial photos of parcels were used to narrow the options – ideal tracts would be relatively flat, close to roads for transportation of heavy equipment (such as steel structures and transformers), and not located too close to existing homes or other buildings.

*continued on next page*



Waynesboro 161kV/69kV substation

## New Employees

As with all projects, once property options are identified, initial layouts can be drawn on the maps to see if preliminary design expectations fit. When the best site is chosen for each facility, the Engineering department works to obtain a Certificate of Public Convenience and Necessity from the Mississippi Public Service Commission. SME's environmental section then begins to prepare an environmental report (ER) for the project and submits it to RUS for approval. Once the ER is approved, the land section acquires the property. Surveys and soil borings are conducted to identify what kind of site preparations and foundations will be needed for the sites. During the same timeframe a design package is submitted to RUS for approval.

"Many of the initial tasks with any project are overlapping and require involvement with many other departments," said John Gilbertson, substation and communications manager. "We work closely with the transmission line design engineers to ensure that suitable accommodations are made for the transmission lines, as well as access for construction and operations personnel. Everyone provides input in order to make a decision that will work at every level."

Gilbertson and Design Engineer Matt Tillman were the principal designers for the White Oak and Polkville projects. They have worked to standardize their substation designs in recent years, but each facility has its own requirements. Modifications must be made to accommodate breakers, transformers and the bus work needed to connect the lines associated with the facility. The White Oak facility requires three 161kV breakers and associated equipment, while the Polkville facility requires one 161kV breaker, one 161/69kV transformer, four 69kV breakers and a 195-foot-tall microwave tower.

"I enjoy the challenge of transforming a wooded tract of land into an electric facility that will be there for the next 50-80 years," Tillman said. "We may use design applications that have many similar fundamentals, but each project has its own unique challenges."

Another important part of the design process calls for ordering material and equipment and developing construction contracts. Tillman and Gilbertson develop RUS contracts for material and equipment purchases and three major phases of construction: site development, subsurface construction, and overhead construction. In the past, the steel structures and most of the material required to build a substation were provided by substation packaging companies, due to SME's inventory and warehousing limitations at Headquarters. With the addition of the much larger warehouse at the FOC, most of the material and equipment required for such projects, except for the steel structures, is supplied by SME's inventory, which has resulted in significant savings.

"The steel components must be designed and manufactured according to the needs of the project, so we still utilize the substation packagers for that portion of the project," said Gilbertson. "But we now have almost 99% of the required material and equipment already set up in our inventory and can work with Supply Chain to order and schedule the necessary items, which keeps our costs much lower. We can see savings of anywhere from 15% to 20% per item by eliminating the intermediate handling by the packagers, which is a direct benefit to our Members."

Construction, which is overseen for SME by Construction Supervisor Bob McCaskill, begins with site development. The site must be graded according to a site development plan based on the area's topography; an access road must also be built; and proper channels for water drainage have to be created. Storm water runoff must also be controlled throughout the duration of the project.

Subsurface construction begins with the installation of station fencing and foundations. Foundation construction includes building concrete footers and piers to support all of the steel columns, breakers, transformers, control house, and microwave tower. In order to resist the potential pressures of faults, high winds and – in some locations – accumulation of ice, the concrete foundations might be rather large depending on the soil conditions at the site. The reinforced-concrete foundations that support the lattice steel columns at Polkville and White Oak contain more than 13 cubic yards of concrete for each foundation and are designed with two levels – near the surface the structures are five feet square, but five feet underground the foundation spreads out to eleven feet square.

The entire area inside the station's fence line will also be protected by an underground grid of copper wire, which is connected to ground rods attached to the structures and to leads tied to overhead static wires on the transmission lines. Combined with a surface of crushed rock, the overall design protects people inside the station from electric shock during short circuit conditions and the station's equipment from lightning strikes. Also included in the subsurface construction is the placement of conduit from the control house that will protect the miles of control wiring that connects to all the communications, SCADA, metering, and system protection components in the station.

Overhead construction at both locations is scheduled to be completed by mid-2010. Each job will be done by a separate contractor. For the White Oak station, the steel structures will weigh more than 115,000 pounds. For the Polkville substation, the steel structures will weigh more than 130,000 pounds. Again, McCaskill will oversee the contractors installing the steel

structures, switches, breakers, and associated bus work. SME technicians will do much of the major equipment commissioning and final checks.

"We want to make sure that the final components are installed the way we want them," noted Gilbertson. "Our guys will be maintaining them once they are placed in service, so it makes sense for them to be involved from the beginning."

While Tillman and Gilbertson do much of the design work for the "muscle," or physical part of the stations, David Lawrence, system protection manager, handles the "brains" of the stations. Lawrence works with manufacturers to design and build the relay protection panels to be located in the station control buildings which, when operational, control the circuit breakers that protect transformers and isolate faults along the transmission system. Also during this time, Kelly Massa, design engineer, works with Tillman, Gilbertson, and Lawrence to design the required communications for the substation. The communications are used to provide operational voice and data circuits between the substation and SME headquarters at Hattiesburg.

The final set of drawings for the White Oak and Polkville projects will contain more than 200 separate drawings. The majority of these drawings and AutoCAD work are drawn by Ted Bower, lead technical assistant, and Tammy Haas, technical assistant. The entire effort relies on the teamwork of numerous employees, as do so many projects across the Association.

"It is very rewarding to look back once a new station is energized and think about all the steps that are involved," Tillman added. "Each project goes all the way back to the annual power requirements study, which bulk power planners use to determine system needs that are then incorporated into a five-year construction work plan."

"During the design and construction of each project, John and I work with a large number of SMEPA employees: drafting, substation construction and maintenance, relaying design and maintenance, transmission design and construction, communications design and maintenance, land, environmental, supply chain, finance, system planning, and system operations. We also work with numerous contracting and manufacturing companies and their employees."

The final result of these two projects will be two major additions to a dynamic transmission system that continually changes and grows. And the work never ends – there are a dozen more projects included in the current construction work plan, which is scheduled to be updated soon.

*photos below: Foundation construction at the Southeast Greene 230kV/161kV/69kV substation in 2007*



**Caleb Jordan** began working as a substation maintenance technician on October 12. He is a graduate of Petal High School and Pearl River Community College, where he earned instrumentation and electrical applied science degrees. Caleb was previously employed by Kohler Engines as an electrician and mechanic. He enjoys fishing, hunting, and other outdoor sports.



Laborer **Troy Paulk** began working at Plant Morrow on November 23. A Richton native, Troy worked most recently as a zechetti operator at Western Container. He was also employed at Georgia Pacific Leaf River for 25 years as a machine operator. Troy is licensed to operate a variety of machinery and is trained in plant emergency operation. He is married to Judith Lynn and enjoys working in his yard and collecting model tractors.



**Chris Curtis** began working as a laborer at Plant Morrow on November 30. He is a native of Columbia and graduated from Sumrall High School, then received a degree in machine shop from Jones County Junior College. Chris previously worked as a machinist at Sandy Hook Machine Shop. Chris is a Level 1 firefighter for the Sumrall Volunteer Fire Department. He also enjoys fishing, hunting, and riding four wheelers.



**Lynn Carlisle** began working as regulatory affairs manager on November 30. She earned a bachelor's degree from Mississippi State University and a juris doctorate from the University of Mississippi School of Law. Lynn also completed certificated programs at utility rate schools at Michigan State University and New Mexico State University. For the past five years, Lynn served as general counsel for the Mississippi Public Service Commission. A Tupelo native, Lynn enjoys reading and exercising.



Electrician **Chris Kirby** began working at Plant Morrow on December 21. A native of Runnelstown, Chris is a graduate of Perry Central High School and Jones County Junior College with an applied science degree in robotics. He was previously employed as an electrician at Hood Industries in Beaumont. Chris is married to Sarah and has a two-year-old son, Aiden. He enjoys fishing, hunting, and playing golf.



# Safety Culture is a 24/7 Thing



By **Don Ganas**  
Security & Safety Coordinator

**Safety** (noun): Freedom from harm, risk or danger; security

**Value** (noun): A principle or ideal; a firmly held belief; something intrinsically valuable

**Culture** (noun): The customary and practiced beliefs, social forms and traits of a group

At South Mississippi Electric we often refer to a "safety culture." We have a modern and updated 152-page Safety Manual in a safety-yellow loose leaf binder. On their first day at SME, all employees receive a safety orientation that lasts approximately two hours. Specific Personal Protective Equipment (PPE) is required for any job being performed. Monthly safety meetings are conducted, and supervisors hold tail-gate safety meetings with their crews to discuss specific tasks before beginning most projects.



These are all tools to encourage safe work practices and strengthen the organization's safety culture. Most of these actions are required by law. But while tools and other "stuff" are important to safety, tools are not the foundation or the heart of a safety culture. A safety culture requires that safety be a firm value that everyone believes in and champions.

Safety is often emphasized in companies and/or made a priority. In some cases, though, priorities and emphases may change; core values do not change. Priorities can be left at the job or office. Safety might be emphasized only when someone is looking. Values go with us wherever we go and are evident to whomever we are with.

Important to holding safety as a value is the understanding that all incidents related to behavior can be prevented. Remove the term "accident" from your vocabulary. Most states no longer use an auto "accident" report form – officers respond to a motor vehicle "crash." Think of the last time you burned your hand, cut a finger or twisted an ankle. A worn pot holder caused my last burn; the tear in my



palm would have been prevented if I had taken the time to put on gloves. A twisted ankle is often the result of the wrong shoes for the terrain or walking on poorly maintained paths. Fess up: most of the things that cause us pain are the result of our own short cuts in safe behavior.

How can we eliminate the temptation to take those short cuts? In my work and at my home, organization and housekeeping are the answers. When my tools are organized and at hand, I will have the correct tool for the job. Is not having the proper tool for a task a valid excuse? An individual who values safety would be inclined to purchase a short step stool for the house to prevent someone from using a chair. We never have enough time to do all the required duties around the house, but an injury caused by not taking the time to prepare for the task can result in unnecessary pain and tragedy.

We must also understand that we cannot maintain safety values by ourselves. I need your encouragement and we all need to encourage each other and our families. Never be embarrassed or timid about reminding someone about safe behavior. In the midst of messy rain or other dangerous highway conditions, I am sure all of us remind family members to be safe as they drive to work or go to school. Just as you would caution a family member in foul weather, caution fellow workers concerning safe work practices.

It is still December as I write this message for January publication. I do not believe there is any other time of the year that brings one's family to mind like Christmas. In the three years I have been with South Mississippi Electric I realize that we are all a family, and that a family tragedy affects us all. That is the best reason to make safety a core value.

In 2010 and throughout the next decade, let us all make safety our first priority in everything we do at work and at home. Do not accept injury or close calls as unavoidable incidents. Prepare for each day's work as if your life depends on its safe outcome. Consciously discuss a safety issue with someone in your house and at work each week. Choose a day for this, and when you do so make it a thoughtful, relevant, meaningful point.

Practice your values. Live your culture. Be bold about encouraging safe work actions or stopping an unsafe action. You might save my life.

## The Power of 12



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### Our Mission:

Deliver the South's best value for safe and reliable electric energy and serve as a common resource for our Member-owners

### Our Daily Responsibility:

Knowing and complying with all environmental and regulatory requirements

### Our Competitive Strengths:

- An experienced, skilled work force
- A commitment to employee safety and system reliability
- A long-term contractual relationship with our Member systems
- Financial health, including that of our Members
- Sustained load growth in our Members' service territories
- Long range planning for cost-effective generation resources
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