

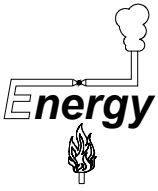
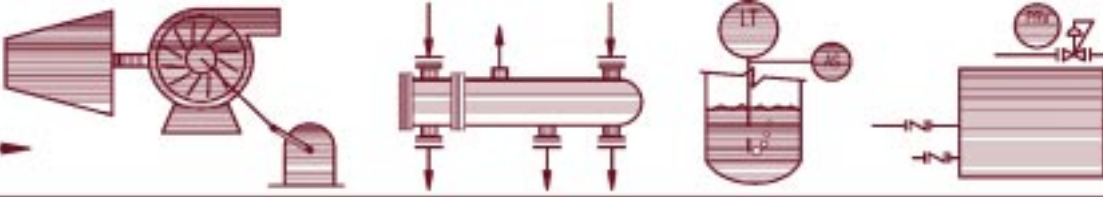
ENERGY SOURCE

A Newsletter published by

ESI Inc. of Tennessee

for Industrial Steam and Power Users

Fall 2001



By: Jackson A. Brown, P.E., Technical Manager, Mechanical Engineering, ESI

Energy - en'er-ji, n. 1. potential forces, 2. effective power, 3. in physics, the capacity for doing work. Wouldn't it be nice if there was a simple reference source available that would easily define how each of our specific energy needs could be fulfilled. That would certainly make life less complicated and more pleasant. Obviously, there is a world of energy-related information out there, but sifting through only a small portion of it and then deciding how that information applies to your specific needs is no easy task. Couple that with the obvious volatility of the energy market (availability and cost), and we have a nice can of worms to sort our way through; however, that is exactly what we must do.

On any day, all anyone in the US has to do is pick up a newspaper or listen to the news report to be reminded of our current energy situation. For most of us in possession of this newsletter, the reminder is ever present in our day-to-day work environment. It has been obvious that we have been rapidly converging on our current energy situation for several years.

Many of us more mature people (common term old _____) can remember energy source eras of coal and oil-gas; coal, nuclear, oil and gas; coal to gas and oil; gas and oil to coal; coal to gas and oil, oil to gas, etc. If you can remember back to the late 70's, early 80's, gas and oil prices were about \$4.50 per mmbtu and coal prices were essentially the same as they were recently at \$2.00 per mmbtu. This led most industrial companies at that time to perform conversions from firing gas and oil to coal; however, in the mid 80's when gas and oil prices dropped substantially and more stringent environmental regulations were imposed, the conversion to coal practically ended. This trend towards using more natural gas and low sulfur #2 fuel oil due to environmental pressures has continued through the last decade. The recent volatility in natural gas pricing has once again brought the use of coal into consideration in the long term planning process. Factors that have influenced or forced energy source changes are availability, emissions requirements, ease and cleanliness of operation, improved efficiency, and improved technology just to name a few. The bottom line, in

more ways than one, has usually been to select the cheapest short-term energy solution.

Another big change over the years is the concern and importance of energy efficiency. In the 50's, 60's, and 70's, most operating wood-fired boilers that had been installed by the forest products industries were coal-fired designs and were actually very inefficient in burning wood waste. As a matter of fact, at the time, the more inefficient they were, the better because they could incinerate more wood waste. In the 80's, companies began looking at trying to take advantage of the energy value of this wood waste.

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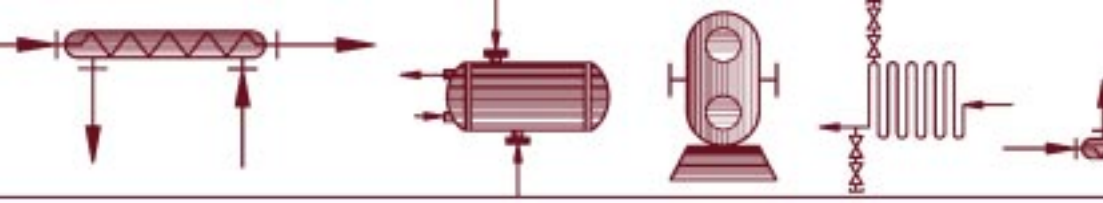
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ESI is an engineering and construction firm that specializes in steam and power projects for industrial and utility clients.

Complimentary subscriptions to the *ENERGY SOURCE* are available by calling 770-427-6200 or visiting our web site at www.esitenn.com. If you have any suggestions or comments about the newsletter feel free to call us or e-mail us at energysource@esitenn.com.

Deanna White
Manager Editor

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ESI performed several projects whereby we performed major conversions to older wood-fired boilers by adding water-cooled surface, installing complete new front walls, designing and installing state-of-the-art fuel feed and overfire air systems, water-cooled stokers, etc. These modifications improved combustion efficiency, improved steam capacity, and eliminated emission problems. Today, with energy costs being the second highest cost behind feedstock, for most companies energy efficiency is of utmost importance.

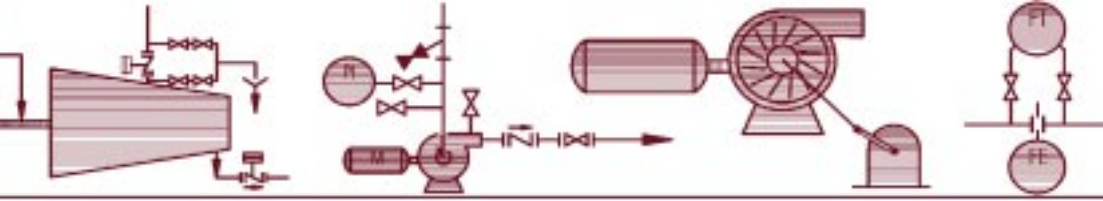
I am sure that there are many of you out there that are very much aware of the impacts that plant energy costs are having on your company's bottom line. I recently heard of a company whose December 2000 plant energy costs were approximately three times what they were just a year ago. Although energy costs are expected to trend upwards, no one could have projected cost spikes like this. A word of caution that ESI has always preached, "maintain as much energy source flexibility as possible." It is important to note that the plant whose energy costs tripled last December was dependent strictly on natural gas.

We are in a period of wildly fluctuating energy costs and uncertain supplies with which we had better be prepared to cope. If asked by someone, "Is your facility under a comprehensive energy plan?", could you respond with a resounding yes? My guess is that a significant percentage of the energy-consuming facilities in the United States are not. There are numerous reasons that energy utilization should be close to the top of our priority list: environmental concerns, economics, preservation of resources, world reputation as a responsible society, and others. Are you staying abreast of these developments, and are you ready to move in the areas that apply to you? As they said in the movie *Apollo 13*, "Gentlemen, I believe that this could be our finest hour." The world has always watched the US and been very much aware of what is going on here. Are we going to rise to the occasion? The energy situation in the US has so many ramifications. We all know that the oil import situation has deepened our trade deficit significantly as well as making us very vulnerable. I am afraid that I do not look on energy conservation as just a "personal virtue with no place in our national energy policy." The opposite is true – it is one of the very first places that we should look and respond. This is quite often the area with the most gain for the least pain. Just changes in production procedures, changed thermostat settings, buying more efficient equipment, maintaining systems at peak operating efficiencies, and literally thousands of other actions could reduce energy bills, reduce our national electrical demand, reduce demand for both oil and gas, and certainly boost our image in the world. I do not think that statements like "it's our American heritage" (plenty of cheap energy) are going to achieve any of the above.

In this day of the world market, we have already seen some sizable losses to foreign competition. One of our lines of response can be to keep production cost down by being energy wise and innovative. One of the things that the good old US has been known for historically is her responsible response to adverse situations. I certainly hope that this great country of ours is ready to step forward to lead the world in the areas of energy conservation, energy efficiency, renewable energy, and new energy technology.

Over the years, practically every ESI newsletter has contained an article about one or more of the following: energy conservation, alternate energy sources, operational and efficiency improvements, or new technologies. These articles are available on our website at www.esitenn.com/energy/archives.htm. Although some of them were written several years ago, they are still pertinent.

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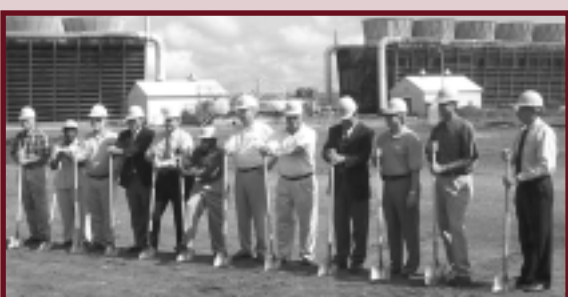
*The hearts and prayers of the ESI Family go out to the victims' families of the recent terrorist attacks upon our country. Our prayer is that their sacrifice will long be remembered in the war to persevere our freedom as Americans.
God Bless America.*

Santee Cooper Ground Breaking



Santee Cooper, Southeastern Fly Ash (SEFA), ESI, and city officials celebrated the Ground Breaking for a new Fly Ash Carbon Burn-Out Facility on June 21, 2001, in Georgetown, South Carolina. ESI is the EPC contractor for the carbon burn-out facility being constructed at Santee Cooper's Winyah Electric Generating Station. This high-tech plant will convert approximately 200,000 tons/year of fly ash from a waste material to a product that is ready for use as partial replacement for cement in ready-mixed concrete. This facility utilizes patented technology developed by Progress Materials to reduce the high carbon content of fly ash resulting

from low NO_x burner conversion of pulverized coal-fired utility boilers. The heat recovered from this process results in an improvement to the utility boiler heat rate. The estimated completion date for this facility is February of 2002.



Santee Cooper Ground Breaking Ceremony

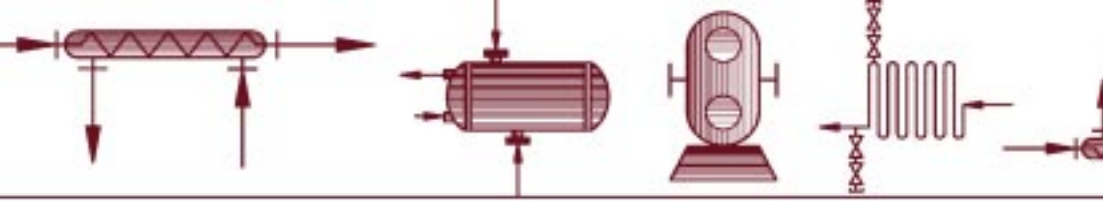
DuPont – Teijin Films Ground Breaking

DuPont, Peregrine, and ESI celebrated the Ground Breaking for a new 120,000 pph Steam Facility on June 27, 2001, in Florence, South Carolina. ESI is the EPC contractor for this new steam facility, which includes the following: two 80,000 pph package boilers designed to produce 150 psig saturated steam firing natural gas or #2 fuel oil, low NO_x burners, one 120,000 pph deaerator, and all necessary auxiliaries housed in a new building. The new system will have a distributed control system that will allow for remote operation of the boiler house. DuPont's steam demand is only approximately 60,000 pph of 150 psig saturated steam; however, the intrinsic nature of the manufactured goods produced at this facility dictates that they can never lose steam. Therefore, completely redundant systems will be designed and installed with margin for future production expansion. This system will replace older, inefficient coal-fired boilers. The estimated completion date for this facility is December of this year.



DuPont Ground Breaking Ceremony

Call ESI for all your Steam & Power needs... 770/427-6200.



To Buy ... Or Not To Buy...

What Would Hamlet Do?

By: William L. Reeves P.E., President, ESI

Today's rapidly changing business environment, which has been accelerated by global competition and proliferation of high technology, has mandated that if you want to compete in this millennium, you must think creatively and embrace new paradigms. One such paradigm shift that has been rapidly evolving over the past few years is the execution and financing of utility projects, particularly in the industrial sector. Whereas the Fortune 500 companies of the past used to have central engineering staffs and plenty of appetite for debt, today's market leader is utilizing specialized contract labor, strategic alliances, and off balance sheet financing to accomplish the capital expansion of its steam and power utility infrastructure.

In days past, monies earmarked for capital budgets have been channeled into more strategic and more economically attractive core business expansion projects. Consequently, the steam and power utility infrastructure of today's manufacturing facility has become aged and in dire need of repair and capital improvement.

ESI is currently executing several projects that have utilized unique and different approaches for the end user to appropriate the needed capital to build new steam and power facilities. These projects include the following:

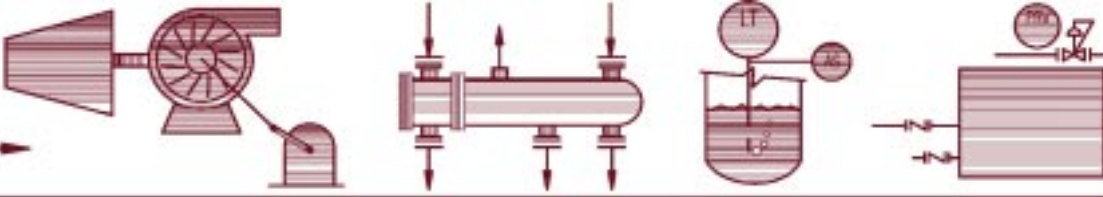
- Design/Build of a new 120,000 pph gas/oil-fired steam facility for DuPont - Teijin Films at their Florence, South Carolina facility.
- Design/Build of several steam and power utility-related infrastructure projects for a Fortune 500 Chemical Company who requested to remain anonymous.
- Design/Build of a 7MW combined cycle steam and power facility for a Fortune 500 Paper Company who requested to remain anonymous.

In the Spring 2000 Issue of the *ENERGY SOURCE*, the article titled "*Too Many Projects . . . Not Enough Capital*" outlined ESI's working relationship with Peregrine Energy Corporation (PEC) in the design, procurement, construction, and financing of steam and power projects. ESI and PEC are currently performing a project for DuPont (see "*DuPont - Teijin Films Ground Breaking*"). Initially, DuPont had economically justified the project and had intended to lease this project; however, as the project developed, DuPont decided to purchase the new installation outright. ESI and PEC were very instrumental in assisting the local DuPont management with the financial justification of the project.

ESI and PEC are currently under contract with the Fortune 500 Chemical Company on several steam and power-related infrastructure improvement projects. The projects include the design, procurement, construction, and financing for the installation of a new continuous monitoring equipment system (CEMS), low NO_x burners, SNCR for further NO_x reduction, new ash handling system, and a new water treatment facility. A master lease contract that makes capital available for projects as they are identified and justified was negotiated and executed. Individual projects are finalized with the execution of a specific project lease supplement to the master lease agreement. This methodology makes it very simple for the local facility to approve and appropriate new capital for projects if they meet certain predetermined financial criteria.

ESI worked closely with the Fortune 500 Paper Company in the preliminary engineering and development of their cogeneration project. During the course of

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So, how long has it been since your company has conducted a thorough plant energy analysis? Do you have an accurate, ongoing plant energy consumption tabulation with bench marks and cross-references to red flag any historically referenced changes? Do you have historical data that can be used to determine the effect of process changes, conservation efforts, efficiency improvements, and so on? In this day and age, the necessity of energy coupled with its cost volatility makes energy surveys, historical energy data, and a continuous energy monitoring program not just desirable, but absolutely essential. If you are interested in conducting a thorough energy analysis of your plant, give ESI a call at 770-427-6200, or e-mail us at info@esitenn.com.

To Buy ... Or Not To Buy ... *Continued from Page 4*

the development effort, ESI provided preliminary terms and pricing for off balance sheet project financing. At the time, they were not interested and intended to self-finance the project; however, other business opportunities, which caused renewed interest in off balance sheet financing, quickly emerged during the initial stage of the project. Ultimately, they elected to utilize a leasing corporation as a third party entity to provide off balance sheet financing of this cogeneration project.

There are basically two approaches to off balance sheet third party financing. The first is to sell existing utility assets to a third party and/or let them invest the needed capital required for modifications or expansion. In this approach, the third party owns and operates the utility system and sells commodities such as steam and power across the fence. The second approach was utilized by the Fortune 500 Chemical Company and the Fortune 500 Paper Company. Capital for the design/build of the new installation was provided under an operating lease structure that allowed the existing facility to continue operating and maintaining the facility under its direct control. The integrated approach of executing the total project requirements including design, procurement, construction, and financing under one entity provides the opportunity to reduce overall cost.

If your facility is in need of improvements, expansion, or compliance with new environmental regulations, and if capital is limited and/or your company is reluctant to incur additional debt, ESI is willing to assess the economic viability of providing third party capital for your project. The bottom line objective is to increase your operating cash flow by performing projects that generate higher savings than the lease payments. For additional information or to discuss a specific need, please contact ESI by e-mail at info@esitenn.com, or give us a call at 770-427-6200. **Visit Us On-Line** - ESI @ www.esitenn.com and Peregrine @ www.peregrinecorp.net.



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