

**WALDEMAR S. NELSON AND COMPANY**  
INCORPORATED  
ENGINEERS AND ARCHITECTS

“consultant”®

Volume 52

3rd Quarter 2009

**A TRADITION OF INNOVATIONS**

By: **Kenneth H. Nelson, P.E.**

In the previous issue of The Consultant, we reviewed some of the innovative designs we have done that saved time and money or solved unusual problems for our clients. Waldemar S. Nelson and Company has been at the forefront of industry innovation throughout its existence, and in this issue we will review some of those accomplishments from the earlier history of the firm.

**The 1930's and 1940's**

Upon graduating from Tulane University in mechanical and electrical engineering in 1936, Waldemar went to work on various industrial projects. These included compressor stations for the transport of natural gas across the country and Frasch process sulfur mines on the border between Louisiana and Texas. The natural gas pipeline experience was cutting edge at the time, but he was told that the sulfur handling experience was wasted effort because there was supposedly enough solid sulfur stockpiled above ground to meet the industrial needs of the world for many years. However, a few years later in the late 1930's and early 1940's, the winds of war fanned the flames of consumption, and the stockpiles were consumed in the process of defeating the Axis powers in World War II. Immediately after World War II, the pent-up consumer demand that had been suppressed by rationing during the war drove another wave of need for sulfur, which is one of the most basic of industrial building blocks, along with iron and petroleum.

**The 1950's**

When Waldemar first went into private practice after World War II, he put to use the experience he had gained in the sulfur mining industry before the war. Our company's involvement in the sulfur industry began in the 1940's with modifications to a mine in the marsh south of Port Sulphur, Louisiana. As exploration for sulfur moved beyond the marsh in the late 1940's, Nelson played a pivotal role in the development of the offshore platform complexes necessary for mine development. In the Frasch process, high temperature, high pressure water is injected into porous limestone formations to melt sulfur, which is then raised to the surface by the combined pressure of the injected water and the addition of compressed air. This requires enormous quantities of both steam and electric power to run the mining operation. We were involved in this early application of cogeneration with the additional degree of difficulty of putting the whole plant in a building which could be lifted by a derrick barge onto a platform about 50 feet above the water and about seven miles offshore. This was done in 1957, only nine years after the very first offshore platform



**Waldemar S. Nelson, P.E., Innovative Thinker  
Pictured here in 1954**

in the world had been installed in 1948 for oil exploration in the Gulf of Mexico. The sulfur mining platform complex that our company designed was the largest in the world at that time, stretching a mile from one end to the other, with connecting bridges that allowed for movement of several feet between platforms both laterally and vertically, as the whole region subsided due to shifting of the sea floor. The







**Tension Leg Platform Installed in Gulf of Mexico**

had converted to CADD. The art of drawing with graphite on vellum paper slowly faded away, but the talent represented in those beautiful old drawings still garners respect when we pull them out of archives.

### The 1990's

Starting in the late 1980's and throughout the 1990's, we worked on a string of floating oil and gas production platforms in ever deeper waters in the Gulf of Mexico. These platforms were a natural extension of the exploration that began on shore, migrated to the marsh, then to bottom-founded platforms beyond the beachline, and finally to platforms well beyond the sight of land. The water depths of successive developments increased to thousands of feet, making the seafloor installations inaccessible to human presence except through remotely operated equipment. In this regard, frontier projects in the oil and gas production industry became as challenging as space travel. The codes that govern the design of these platforms had to be constantly rewritten to address the new environments we were operating in, and our staff members have participated on the committees that write these codes. It is a credit to their talent that they have been invited to help shape the documents by which the industry operates.

In the 1990's there were also more expansions of the overseas copper mine which we had worked on in the 1980's. In prior years, we had to send paper copies of the drawings and specifications half way around the world to support these projects. With the development of the internet, we were able to greatly accelerate the pace of

these projects by electronic transmission of drawings. The delivery of a set of drawings which had previously taken two weeks could now be accomplished in minutes. In the most extreme cases, we would finish a drawing during the day, send it to the job site via the internet that evening, and due to the construction taking place across the International Date Line, the drawing could appear to be utilized the day before we finished it! Likewise, telefaxes bearing formal requests for information could some-



**Directional Drill**

times result in the question apparently being answered the day before it was asked. In such instances, we liked to ascribe the clairvoyant performance to the extraordinary talent of our design team.

The 1990's also saw increased involvement for us in the pipeline industry. We were involved in several large diameter natural gas pipeline projects, including one

very interesting crossing of the Mississippi river by two 24" diameter lines using directional drilling. The length of that drilled crossing was thousands of feet, but the contractor managed to hit his targeted exit point within a man's pace.

### The 2000's

After passing the year 2000 with no "Y2K" issues, we plunged into ever deeper waters in the Gulf of Mexico, and also expanded our worldwide support of oil and gas production operations. Many of these projects necessarily involved technology at the frontier of their fields. The growth of the liquefied natural gas market brought opportunities to work on some installations that were literally "serial number 1" of the type of machinery involved. We also expanded our involvement in procurement activities to facilitate our clients' projects.

Another opportunity to apply our directional drilling experience came along in the early 2000's. The local utility had a need to move a high voltage line crossing of the Mississippi River from overhead to under the river. We designed all the facilities for a very long and complicated route under the river that had to avoid many existing obstacles. The bore diameter was 54 inches, and the drilled length exceeded 3000 feet. It re-

quired pushing the equipment and materials to their limits to achieve the installation.

Perhaps our most challenging need to innovate in the 2000's was in response to hurricanes that impacted our two offices. In 2005, the flooding following hurricane Katrina resulted in the (almost) total evacuation of the city of New Orleans. A few of



our dedicated building operations staff kept vigil in the office complex and allowed us to return only one week later to install a large generator and start operations as one of the first businesses back in the saddle restarting the economy of New Orleans. In 2008, hurricanes Gustav in New Orleans and Ike in Houston challenged our staff with widespread electrical outages that lasted days. The return of our dedicated staff to their work at the earliest possible time, and no matter where that work had to take place, is what kept us from suffering what could have been catastrophic losses. It is that kind of spirit, rising to meet any challenge, which drives our staff to come up with innovative solutions for our clients.

We invite our clients with current unique design needs to contact us. We may be able to come up with an innovative approach that will be remembered sixty years hence.

### NELSON Employees Have Fun with Snoballs and Ugly Ties

New Orleans employees had some fun bidding so long to Summer with a Snoball party and Ugly Tie Contest. The party, held during lunch time, took place on the first day of Autumn, but the anticipation of colder days ahead didn't interfere with everyone cooling off one last time with one of our favorite treats.




Ugly Tie Winner Bill Landry with Ginger Dodge



Kirk Boudreaux and Bob Lovinggood





Advisory Committee  
**CPERC 2009**  
**ANNUAL TECHNICAL REVIEW MEETING**  
 HOSTED BY  
**Advanced Materials Research Laboratory**  
 SOUTHERN UNIVERSITY AND A&M COLLEGE  
 BATON ROUGE, LOUISIANA  
 Friday, August 28, 2009

*A partnership for clean, reliable, affordable energy solutions for the state and the nation*

Back Row l to r; Sumanta Acharya, George Bartlett, Keith Crump, Ting Wang.  
 Front l to r; Ben Russo, Charles Nelson, Paul Hinnenkamp, Charlie Cusimano, and Bengt Jarlsjo

### NELSON Joins the Louisiana Clean Power and Energy Research Consortium

By: Charles W. Nelson

In 2003, Gov. Mike Foster established Louisiana's Clean Power and Energy Research Consortium (CPERC) to address critical scientific issues in Louisiana related to power and energy generation. The consortium emphasizes issues related to energy efficiency, reliability, reduced emissions, alternative fuels and alternative energy systems. Its six university members are LSU, the LSU AgCenter, Nicholls State, Southern, Tulane, ULL, and UNO. Each university has core research expertise in separate energy research areas and collaborate with one another on integrated projects. Current selected projects include combustor burner re-design to reduce emissions; fuel alcohol production from post-harvest sugarcane residue; butanol production via microbial pathways and sugar mill waste; gasification of coal, biomass and petcoke; high-temperature ceramic coatings for gas turbine blades; and renewable fuel and chemical production from agricultural, industrial and municipal derived feedstocks, including algae cultivation.

In April of 2009, NELSON was invited to join CPERC's Advisory Board, along with other industry partners from The Shaw Group, the USDA, Cleco, LaDNR,

La Economic Development Department, the US DOE, Entergy, and Turner Industries. During the Board's April meeting at LSU, Sen. Mary Landrieu addressed the group and confirmed \$2 million in funding had been provided by the Federal Government to support CPERC's ongoing research. At CPERC's annual meeting in August, Chairman Charlie Cusimano encouraged the consortium to continue its critical technology developments in clean power and energy generation. Dr. Sumanta Acharya, LSU's L. R. Daniel Professor of Mechanical Engineering, and Director of LSU's Turbine Innovation and Energy Research Center (TIER), also asked for Board assistance in the following four areas:

- Dissemination of information on CPERC to Louisiana industries
- Identification of industry needs wherein CPERC's talents can be applied
- Communication with Baton Rouge and Washington, D. C. regarding application of funding as such is made available
- Introduction of new members to CPERC

To that end, if any industry needs are identified or known to those reading this article, we would be happy to bring them to the attention of CPERC. Contact can be made to [charles.nelson@wsnelson.com](mailto:charles.nelson@wsnelson.com), [ben.louviere@wsnelson.com](mailto:ben.louviere@wsnelson.com), or directly to CPERC via their website, which is [www.cperccla.org](http://www.cperccla.org).



# Celebrating 20 Years of Community Service

**By: Ginger Nelson Dodge**



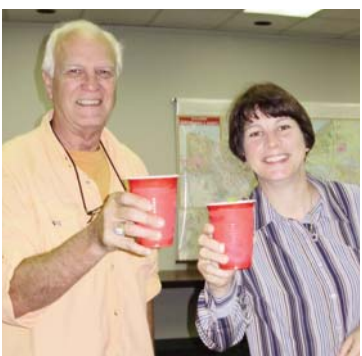
Ginger Dodge and Waldemar Nelson - 2004



Martin Patterson - 2008



Bill Berg - 1990's



Ambrose Amedee and Angela Fehn - 2008

On September 24, 1990, Waldemar S. Nelson & Co., Inc. hosted our first blood drive in partnership with Ochsner Blood Bank. Eighty-five pints of blood were collected, and a long tradition began. Charles Nelson had received a "cold call" from the hospital recruiter asking if we would hold a drive. We said "Yes", and our loyal donors are still saying "Yes" over and over again. According to their records, over 1,593 pints have been donated giving life saving support to people all over the country. Through cooperation with other hospitals, the units are traded back and forth to ensure a steady and safe supply of whole blood, platelets and plasma for the ill or injured and for newborns who may require a complete change of blood supply.

On September 24, 2009, we hosted our twentieth annual blood drive. Forty-six pints of blood were collected. We anticipate the same at our second drive to be held on Thursday, December 10th. By staging the drive in two phases, we are able to achieve participation from the equivalent of 25% our staff. This garners more blood for the blood bank and also secures a commitment for blood replacement in the event of need for all of our staff and all of their families! It only takes a few minutes to donate, and the atmosphere has always been upbeat and fun. The Ochsner staff says that we are their favorite drive, as they have a steady stream of willing donors in good spirits. Snacks and drinks are provided, and somewhere along the way, we began serving "Virgin Bloody Marys" which are very popular. Video favorites are "Johnny Carson's Greatest Hits" and the ever popular "Macarena lessons". We appreciate the ongoing loyalty of all of our donors and are proud to continue this very worthwhile and mutually beneficial relationship.



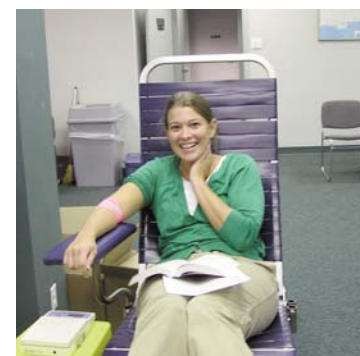
Ginger Dodge Donating Pint No. 1,639 with Ochsner Blood Bank Employees - September, 2009



Blake Caço - 2007



Rob Denman - 1990's



Kristen Smith - 2008



Bart Harris - 1990's



NELSON once again participated in the Houston Livestock Show & Rodeo Calf Scramble Donor program. This community support program benefits area FFA participants and 4H. Bart and Cheryl Harris represented NELSON at this year's calf scramble held in Houston on March 22, 2009. The Harris's were on hand to congratulate Jessica Francis for succeeding in tagging a calf which she will raise and show at the 2010 Houston Livestock Show & Rodeo.

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