BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT

Interviewee:	Kenneth Nelson
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Place:	New Orleans, Louisiana
Interviewer:	Jason Theriot
Ethnographic preface:	Ken Nelson's father and his partner founded the Waldemar S. Nelson and Company in 1945, and his son grew up working in the Gulf of Mexico offshore oil and gas community from the get-go. Much of the firm's early work pertained to offshore sulfur extraction. The company also began to specialize in the design and build of fixed platform structures and topsides. In 1999, Waldemar S. Nelson and Company, Inc., opened up a Houston office, eventually transferring about one-third of its business there from its headquarters in New Orleans. At the time of interview, Nelson was a senior vice president for the firm.

File 1

JT: This is an interview with Mr. Ken Nelson from—say the name of your company.

KN: Waldemar S. Nelson and Company, Incorporated, in New Orleans, Louisiana. We're engineers and architects, and our company was formed in 1945 by my father, Waldemar Nelson, and his partner, Colonel Bidell [phonetic], with whom he worked during World War II on the construction of Camp Claiborne in North Louisiana. After the war, they formed a partnership and the two of them and one draftsman started off and eventually Mr. Bidell's son came into the practice also. From 1945 until Colonel Bidell's death in 1955, they were partners, and then, tragically, in 1956, Colonel Bidell's son also passed away. He had been a football player at Georgia Tech and I think it was a heart attack when he was in his mid-thirties.

So in 1956, we became Waldemar S. Nelson and Company, Incorporated. We grew from there to our present size of about 350 people. In the last dozen years, we've consistently ranked usually in the top half of the *Engineering News Record* 500 list of top engineering firms and we've gotten up as high as within the top 200 several times. We operate worldwide. Our main office is in New Orleans.

In 1999, we opened an office in Houston, Texas, to follow the major oil companies who had started moving their offices over there. We'd been working for them for years here in New Orleans, and they told us that they had a lot of work that they wanted to give us but we had to have a presence in Houston to respond to it. So we opened that office in '99 and now about a third of our company is in Houston, two-thirds still in New Orleans.

We've been involved in offshore oil and gas and sulfur production since the inception of our company. A lot of our early work offshore was for Freeport Sulfur Company, and those platforms were for production of sulfur by the Frasch [phonetic] process, in which superheated water was injected into the formation and would melt the sulfur out of the limestone rock and it would be pumped to the surface. It was a lot of the same technology as was used for offshore oil and gas production, just a different commodity.

JT: And what years were the sulfur platforms?

KN: The first offshore sulfur platform was the Grand Isle platform in 1957, which was about seven miles off of Grand Isle, Louisiana. Earlier than that, however, we'd been designing production facilities for sulfur in the coastal marsh areas of

Louisiana. The Grand Decaille Mine [phonetic], we did an expansion of it in 1947 and it had been built in the thirties, the initial mine. But the coastal drilling and production for sulfur facilities that we did started off in the marsh and then stepped offshore into fifty feet of water seven miles offshore of Grand Isle in 1957. Then there was another facility built at Camenata [phonetic] Pass around '67. Then in the early nineties, '91, I believe, was when the Main Pass Sulfur Mine at Block Main Pass 299 was built in 210 feet of water and we worked on the process facilities for that.

So we really, concurrently with the sulfur production on platforms, we were designing topside facilities for oil and gas production starting on the Continental Shelf and following it out into deeper and deeper water until today we are working worldwide on deepwater production systems. We have worked on many of the tension-leg platforms and deepwater facilities on other types of deepwater installations like compliant towers or just traditional bottom-founded platforms in the Gulf of Mexico in waters deeper than a thousand feet. From that experience, we have traveled worldwide, doing design of oil and gas production facilities throughout the world.

Really the offshore industry, the cradle of the offshore industry was southern Louisiana, and the people and the fabricators, the designers, the installation contractors that are now working worldwide, many of them came from the cradle of the oil patch in southern Louisiana. The center of gravity of the oil world has shifted in recent years from New Orleans to Houston, but even a lot of those Houston companies have some roots in the New Orleans area.

JT: Tell me about your engineers on staff. We were talking earlier about how these new structures were being developed and really there was no generic or standard codes. Tell me a little bit about how that evolved, how these new codes evolved with this technology and how your company was a part of making that happen.

KN: We started out doing production facilities onshore. In the near offshore environment, you were on platforms in maybe fifty feet of water, so it was in a marine environment but it was not a floating facility like a boat. So it was neither fish nor fowl. The types of codes you might use in, say, a chemical plant onshore were somewhat applicable, but there were some issues with the marine environment that made codes that were maybe closer to a Coast-Guard-type specification be applicable. And in some cases we had to just sort of write the rules as we went, and some of our employees ended up working on the Code Writing Committees of the American Petroleum Institute or the Institute for Electrical and Electronic Engineers, IEEE, API, and even with the Coast Guard,

to adapt existing codes for these new challenges of doing something that was once a land-based activity on floating platforms. You have unique problems that come about from the motion of a vessel that you would never have to deal with in, say, a refinery.

There were also issues of classification of electrical areas and making sure that equipment was explosion-proof and containing vapors that may accumulate and create either an explosion hazard or perhaps an inhalation hazard in the case of sour gas production, hydrogen sulfide. So it's an interesting study in the development of the rules that the industry uses, and we've been lucky enough to have some very sharp individuals, some engineers who were leaders in their fields and were actually instrumental in writing some of the rules by which these facilities are designed.

It's interesting, one of the early platforms we did in 1957, the Grand Isle offshore complex, predated the publication of the American Petroleum Institute's recommended practice for designing platforms by twelve years. That was not published. The first version was published in 1969, and so it's interesting to look back at the calculations and see some of the assumptions that the designers were making and you would see in the margins of the calculations a note written by the engineer saying, "Well, by traditional design parameters, this member might appear to be overstressed. However, due to these factors that I'm considering because of the nature of the structure it's going into, I'm going to use an allowable stress that perhaps is three-quarters of the yield strength instead of two-thirds of the yield strength."

Well, years later, that very assumption that this engineer was referring to in 1957 or so was incorporated into the national design code. There were two platforms, actually. Fifty-seven was Grand Isle and '67 was Camenata—

JT: Where's Camenata?

KN: That's off of Camenata Pass. It's also off of South Louisiana about five to seven miles offshore and west of Grand Isle. Let's see. I have to look at the map. I believe it's west. Anyway, it's in the same general area.

JT: Lake Palto area?

KN: No it's on the way to—you leave from the Grand Isle helicopter base to get there. But it is in between Leeville and Grand Isle, off that coast, just past Fourchon.

That incident of the calculation indicating by premonition that the code would eventually be changed, I think that may have happened in the 1967 calculations rather than the '57, but it's really quite amazing that that 1957 complex, which was the largest offshore complex in the world at the time, was all designed just by hand and slide rule and they may have used some rudimentary computer programs to calculate some of the wave loadings. But there are stories of a whole roomful of engineers sitting around a conference table, and these were very repetitive and tedious calculations. They would set up a calculation form and one man would do one step in the calculation and hand it to the guy next to him, and they would pass the calculation sheets around the table to keep it from being too mind-numbing for one person to do.

It's really incredible. That platform complex survived from 1957 until it was finally shut down sometime around, I'm going to say '90 or '91, and just designed by basic sound engineering and judgment rather than computer methods, and yet it survived for decades in the hurricane-prone waters of the Gulf of Mexico. Really quite amazing that it lasted that long without the benefit of the analytical tools and the codes that we later had to assist us in designing those.

JT: You've often talked about this project in the two or three times that we've talked in the past, Mr. Nelson. It seems that it was a very big project for your company and perhaps a big pioneering project for the industry. How can you look at future projects that your company was involved—and I'm talking about some of the early deepwater offshore, thousand-feet-plus, with some of the major oil companies that you and I have talked about your company worked on, some of the large jackets of platforms and then further down the line in the deeper water, some of the tension-legs and whatnot—is it possible for you to place that 1957 and then its sister, the '67 project, as a chronological evolution of architecture and design of these platforms? Did some of your same engineers that worked on those work on projects in the eighties?

KN: Yes, absolutely. It was just a continuous evolution from starting off in the marsh, stepping offshore into fifty feet of water and then off into hundreds of feet of water and ultimately into a thousand and over.

For the bottom-founded platforms, the ones that are attached to the bottom with piling, the topside systems were largely the same. The real breakpoint came when we get into water over a thousand feet deep and you have to move to a floating system. That's the point at which you really get into a crossover of design codes from sort of evolved land-based codes into sort of Coast Guard or ABS, American Bureau of Shipping, or DNV, Det Norske Veritas-type rules, which were

originally developed for ship construction and were adapted to the design of these floating platforms which were towed into position and then moored in place with cables or chains or tendons, and operated in a marine environment much like a vessel would, with the exception that they were permanently moored in place.

So it's been a continual evolution and a very natural one for people who started out working on platforms in a marine environment in shallow, near-shore waters, as we've gone deeper and deeper out. It's really just been sort of stretching the envelope with each step into deeper water until this real breakpoint of switching from platforms that are rigidly attached to the bottom to platforms that have to be floating because of the extreme depth of the waters.

JT: Can you tell me what is the specialty of your firm? In other words, what particular components does Nelson really excel at in designing for these types of floating structures that we've talked about?

KN: Our specialty is what's called topsides design, which is basically everything above the top of the deck of the hull that floats them. It's the production facilities, the piping, the electrical facilities and the crew quarters, the heliports, everything that sits on top of one of these floating platforms and enables the facility to produce the oil and gas. We do some work on the structures themselves and some systems that go into the hulls, but generally the hulls themselves are designed by a naval architect. So we are mostly designed in those parts of the facility that, as I said, evolved from the bottom-founded platforms.

JT: You are the president of the company?

KN: No, I'm a senior vice president. My brother is president and chairman. My father passed away in November of 2005, a couple of months after Hurricane Katrina, but he was actively involved in the company up until his passing. He graduated from Tulane in 1936 with a degree in mechanical and electrical engineering. He eventually became registered in forty-four states as a professional engineer in different disciplines in each state, but he eventually became registered as a mechanical, an electrical, and also a civil engineer in various different states for a total of forty-four. He practiced from 1936 until his passing in 2005. He was a real pioneer in the field of engineering and a real stalwart of the engineering community and he's very fondly remembered by both his family and his colleagues.

JT: Mr. Nelson, I noted you guys have been involved in many of the projects that we are referring to in this deepwater project, this History Three from MMS. You

actually mentioned several of the well-known projects that kind of set the path in the early eighties up through the nineties. So we're going to come back and talk with you at a later date, perhaps with some of your engineers who are on staff here who were involved in designing some of these in the Gulf of Mexico, but also, apparently, you guys have done some work all over the world and off of Africa, as you mentioned before, and even some inland infrastructure projects which I don't think we touched much on today, like the Venice Deepwater Future Project, but also some of the other things that you've mentioned in the past. So I'm going to say thank you for your time, Mr. Nelson, and today's date is the twenty-first of August, 2008. The interviewer is Jason Theriot. This is for the MMS Deepwater Project and we'll talk to you soon.

[End of interview]