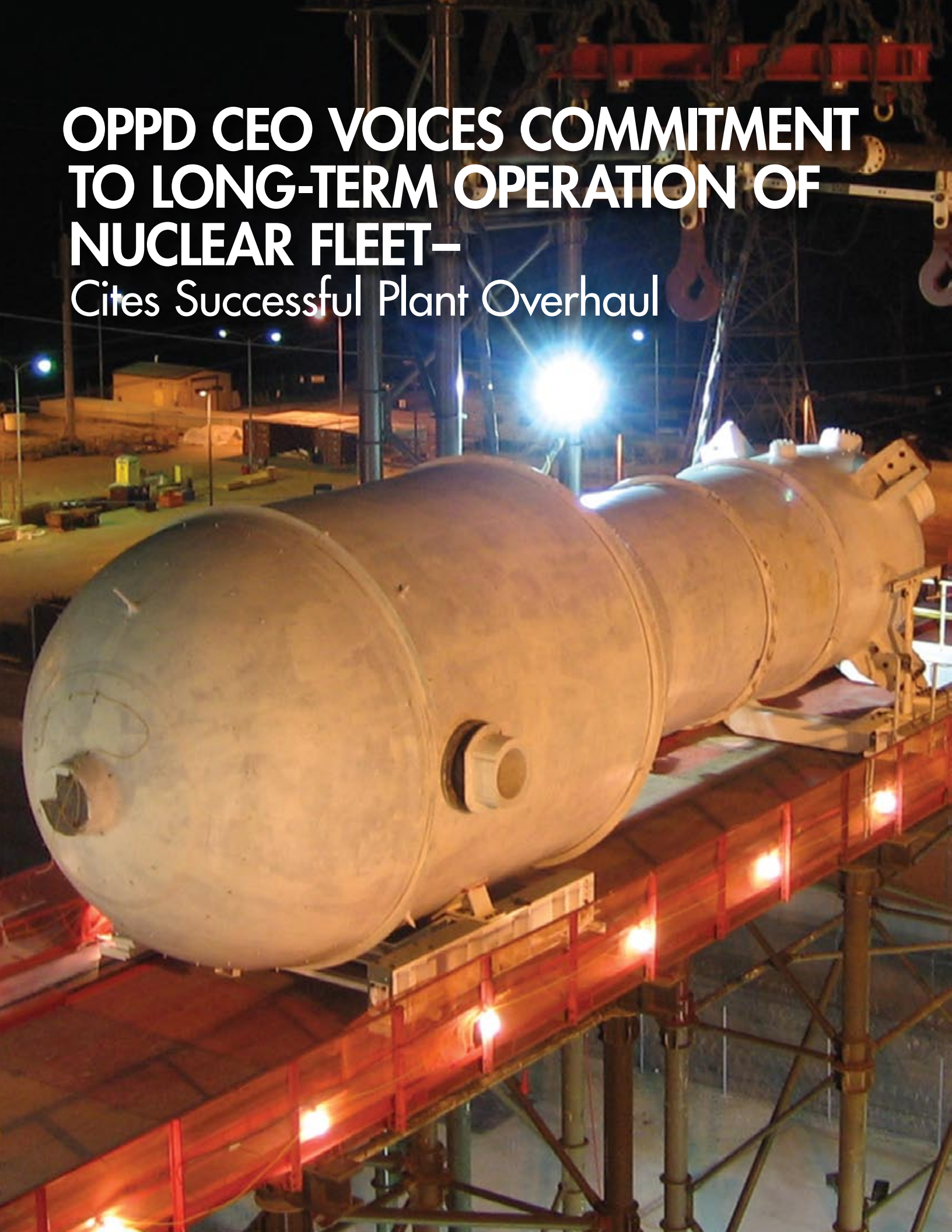
OPPD CEO VOICES COMMITMENT TO LONG-TERM OPERATION OF NUCLEAR FLEET–

Cites Successful Plant Overhaul



Omaha Public Power District is the 12th-largest publicly owned electric system in the United States, serving a 5,000-square-mile area in Nebraska with 2,548.8 megawatts (MW) of diversified power generation: 46.3% coal, 18.9% nuclear, and 34.6% oil and natural gas, with 0.2% landfill-gas and wind. In 2006, OPPD completed a successful 85-day outage at its Fort Calhoun station, a 482-MW nuclear power plant, in which most major components and systems were replaced or refurbished. OPPD Chief Executive Officer Gary Gates discussed the reasons for OPPD's successful project and its confidence in the long-term operation of the world's existing nuclear power fleet.

EJ: OPPD has demonstrated its commitment to the long-term operation of its assets. Why is that so important to both OPPD and the utility industry?

Gary Gates: Well, there are three basic points there for us. Capital costs of new construction are so high that the longer you maintain your existing infrastructure—there's just a tremendous cost benefit. Second, as we look forward, we are very comfortable with nuclear power. We have operated it for a number of years, and our board is comfortable with it, so it was not a stretch to want to continue to run our nuclear assets further into the future. Third, nuclear is a carbon-free asset, and those are just increasing in value. So from both the business and the philosophical perspective, it was the right thing to do for our company.

It made sense to operate Fort Calhoun as long as possible. We are like most full-scope utilities that have all the forms of generation. With us, this is not a change in philosophy to run units a long time—we have done it with our coal units, we have done it with our gas turbines—and so going for 80 years for a nuclear unit, going past the current 60, is not a stretch for us philosophically. We have done that with power stations forever.

EJ: OPPD's actions really represent an industry-leading vote of confidence, don't they?

Gary Gates: We think so. We put about $400 million into the plant, and it allowed us to do a lot of things proactively.

EJ: What major components and systems did you look at on the front end?

Gary Gates: We knew the steam generators were going to need to be replaced—particularly looking at 40 more years—and the same thing with the reactor head. But we had only about 5% plugging in the steam generator after 30 years of operation. Our pressurizer had no problems at all, but as long as we had a hole in containment, we said, let's change that out and make it the right size to uprate the plant. We factored in a 17% uprate, and we're proceeding with that now.

Photo: OPPD

> "We are in this for the long haul."
> – Gary Gates

EJ: So materials degradation or operational issues were not driving the timing of your work at Fort Calhoun?

Gary Gates: Right. What we learned from the industry and what we learned from EPRI was to look at our projections and choose an optimal time in our corporate financing to do it.

EJ: How far out were you looking as you assessed the plants and your needs?

Gary Gates: Our typical plan is 25 years. We are increasing that to 40 years right now in our integrated resource plan. That sounds like a long time, but I understand that India has a 250-year plan for their power. Isn't that an interesting way to look at it? I personally think that for the new units, we are going to plan for 60 to 80 years. It makes a huge difference on everything, from accumulating decommissioning costs to amortization.

EJ: But that is certainly realistic, isn't it?

Gary Gates: Oh yes. I think for the new designs, we need to factor in an 80-year life, right from the get-go. And actually, for the units we are operating today, the 40 years was a financial number, not an operational limit.

EJ: When you were looking at Fort Calhoun, how did you assess risks and rewards?

Gary Gates: There was the finite risk that we would not be granted a license extension, and that obviously would have changed things. We were confident that we understood that risk—but as a short-term risk. The larger risk was that we would not be able to run the unit. The rewards were pretty obvious. We had a great asset, the plant was paid for, and we could run another 20 years. There was an operational risk, because as a single-nuclear-unit utility, we needed to continue

to run the plant. But we were confident we could do it, and it would be a great asset for OPPD.

EJ: In addition to the major components that you mentioned, were there other critical systems or structures that you decided to include in the scope of the overhaul plan?

Gary Gates: Yes, we looked at the secondary side—major feedwater piping and steam piping. We replaced all the heaters and moisture separators on our turbine system, and the low-pressure rotors. We are going to replace the high-pressure rotors, but that is an upgrade piece for the power uprate. We did do some instrumentation, and we have some digital systems but have not gone to digital completely. We upgraded a couple of our containment systems, and about four years ago we put in a new condenser in preparation for this.

EJ: What gave you the technical confidence to proceed on so many fronts with such a hugely complex undertaking?

Gary Gates: The confidence we had was confidence in the industry. We relied tremendously on EPRI, which helped give us the technical confidence that we had the right solutions. Our board of directors had confidence in our operation of the plant and the fact that it absolutely made so much sense for us financially to keep Fort Calhoun in the mix. Also, being a rather small utility, we partnered with our vendors, making it essentially a turnkey operation; so they had a lot of skin in the game to make sure it went right.

EJ: They were instrumental in helping you schedule and stage the work?

Gary Gates: Absolutely. Mitsubishi Heavy Industries helped us look at some innovations with steam generators based on their experience with the internals. With Bechtel, we interviewed the teams who were being considered and included contract requirements for people with experience, who had done a good job elsewhere and were good to work with. We had people here that were doing their third steam generator replacement. They knew how to rig the cranes and the ways to get the reactor vessel head and the steam generator in and out. We sent people to do quality control for the big equipment in Japan. We had some Nebraska guys that got to like sushi really well, and they basically lived right next to the work and were there every day as our equipment was constructed.

EJ: How did the results match up with your goals?

Gary Gates: Our goal was to complete the outage in 90 days, and we did it in 85 and were about $36 million under budget. We had anticipated about two to three shutdowns as we came up with new equipment, but the plant returned to operation and stayed at 100% for 280 days.

EJ: What else contributed to your success?

Gary Gates: We took 18 months just to optimize the choreography—where to put the new equipment, the temporary structures to house and assemble it, where you're going to dispose of your equipment. It was so finely tuned that we had the old head and the new head passing each other at the gate—one to be installed and one wrapped, ready to go to storage. There was no wasted motion; things just moved continuously. We laser-surveyed the containment ahead of time, we put the new steam generators in, and I think they were three-thousandths [of an inch] off in lining up

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heads and nozzles, which was perfect. I think the new technology giving you the ability to size your components and align them is something that people underestimate—the ability to survey and then translate that to manufacturing. It's not like the old approach, where you measure it, then see where you are.

EJ: Going back to a point you made earlier about the role of EPRI, where was OPPD able to realize value from collaborating with EPRI?

Gary Gates: I can think of several of the reports—the life-cycle management tools, the examination techniques that you put out for pressurizers and steam generators—that helped us in the end to make informed financial assumptions. For example, there's the question of whether to replace major components. Through EPRI's work, we were able to see that if we didn't replace them, pretty soon our inspection dollars per outage would have paid for the new components. With your inspection reports, we were able to do much more work in parallel during the outage, instead of doing things in sequence. We used a lot of your coating information as we looked at coatings, not only for the nuclear part but for our replacements on the secondary side. We used EPRI condenser technology reports in sizing our new condenser, deciding what materials we wanted, and deciding if we could sectionalize the condenser. Putting a condenser in a plant is harder than putting a steam generator in, because you've got a lot more pipes and stuff to contend with when you're trying to get down in the basement of your turbine building. We used air floaters—floated these things in, and it was quite a process—but we had huge computer modeling where we again laser-surveyed, then did the computer model on how we were going to work these things in.

tage of the industry, including the operating experience that's out there. We went to a lot of sites that were doing this kind of effort, to learn from them. In an operation this big, minimize the number of rookies. We need to have some rookies, because the industry needs to prepare them. You can't have a first-time team all the way through or it is going to be hard, hard to get there. Planning is the secret. Sweat the details as far out as you can on how you are going to coordinate things. We had developed a separate division, we put about 40 people in it, and they had various pieces of this outage. Then we matched them up with the vendors, but a lot of the scheduling tools came from the vendors. We put together the new division three years out, because we did not want them worried about any of the operating issues.

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EJ: So, given what you have learned from Fort Calhoun, what do you think is a feasible life span for a nuclear plant?

Gary Gates: I would say 80 years, without question. And I think if we do the new ones right, a 100-year lifetime is easily achievable.

EJ: What can EPRI and our members learn from OPPD's experience and success?

Gary Gates: When you go into a refurbishment like this, or to extend plant life, even if the system says 20 years, design it and buy components for 40 years. That gives you a margin. Second, take advan-

EJ: What does your work at Fort Calhoun mean for nuclear power and the industry?

Gary Gates: We have great assets in our existing nuclear fleet. I see no technical reason we can't run these plants for 80 years. You ask yourself, is there a financial issue? And every time you look at the finances, it is positive. So from a business case, it makes sense. Nuclear energy is carbon-free, it's safe, and it provides stability and diversity for our fuel mix. It answers a lot of basic needs if you are building an ideal utility—a good, forward-looking utility. I have a clear message for everybody: we are in this for the long haul, no question.