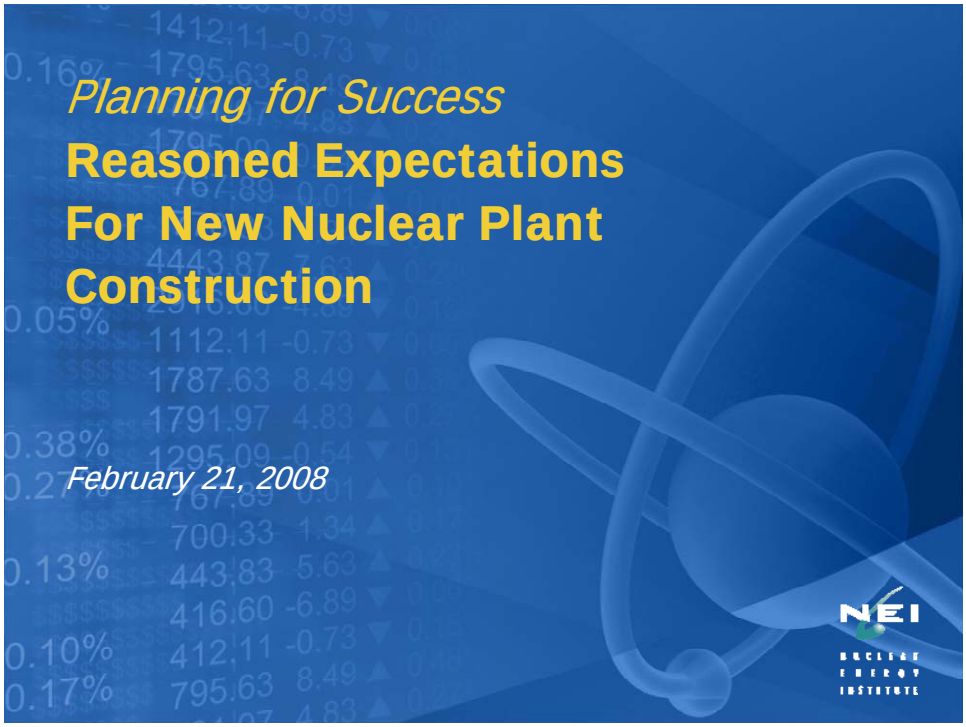


John Rowe –

Good morning. I am John Rowe. Some of you may know me as Chairman and CEO of Exelon. That is only my day job. I also serve as chairman of the Nuclear Energy Institute's Board of Directors and, on NEI's behalf, let me welcome you to NEI's annual briefing for the financial community.

My company and others are considering construction of the first new nuclear power plants in the United States in several decades. We are doing so because the fundamentals of the electric power business demand it. The need for new baseload generating

capacity is unmistakable. The electric sector's dependence on natural gas exposes our customers to unpleasant price volatility, and our companies to unwelcome political stress and regulatory pressure. And uncertainty over future controls on carbon emissions will cast a cloud over coal-fired generation for as long as we avoid our responsibility to address the climate change issue squarely.

Experience with new nuclear plant construction in the United States is now 20 to 30 years in the past, and it was not an altogether happy experience. There is no argument about the consequences – cost overruns, delays, financial damage to companies. But what caused it?

Some believe that licensing and regulation were largely responsible for the delays and cost overruns. In fact, an honest reading of the record shows that licensing was a factor, but not the only factor. We were also undone by our own poor project management, and by unforgiving business and economic conditions.

So we have structured this morning's briefing around the theme of "reasoned expectations" for new nuclear plant development.

It is crucial that all of us – those of us in the industry, and you in the financial community – share a reasoned perspective on the risks of new nuclear plant construction.

That perspective should not overstate or understate the challenges facing companies developing new nuclear projects. We must be cold-blooded, analytical and dispassionate.

A dispassionate assessment of new nuclear plant construction must acknowledge the large financial risk associated with a capital project that may cost around $7 billion and represent a substantial portion of a company's market value.

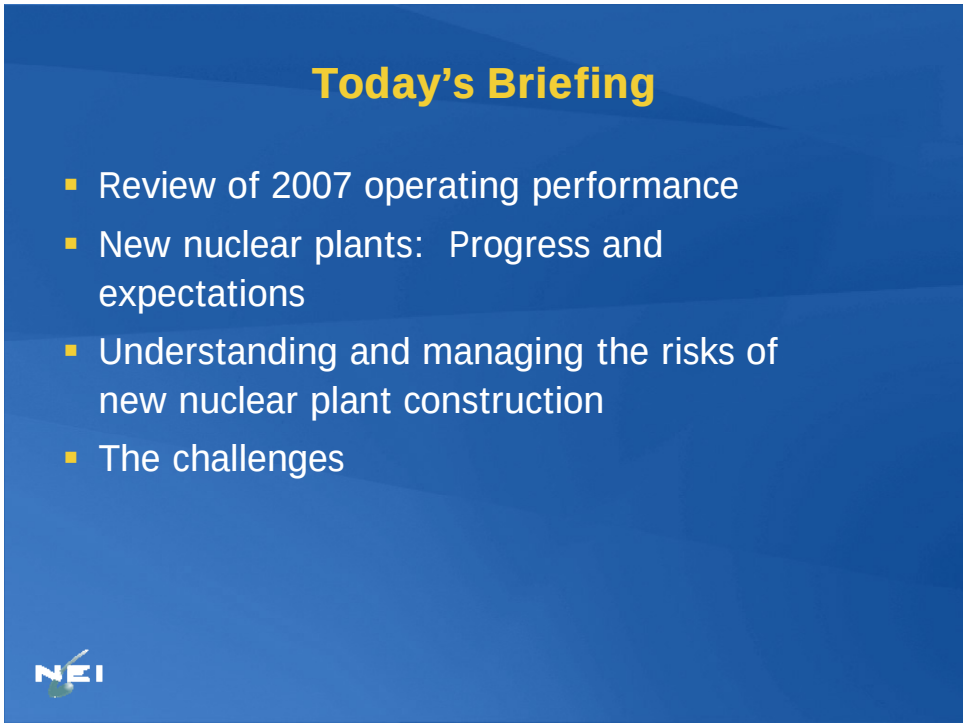
A dispassionate assessment must recognize the major challenges associated with bringing such a venture to completion without delay, and within budget.

But a dispassionate assessment also shows that many of the conditions that led to large cost increases and construction delays

for many operating nuclear power plants no longer exist, that the remaining risks are reasonably well-understood, and that the industry has taken steps and created mechanisms to manage and contain those risks.

Here now is Skip Bowman, NEI's president and CEO, to bring you that reasoned perspective on the subject of new nuclear power plant development.

Skip ...



Skip Bowman –

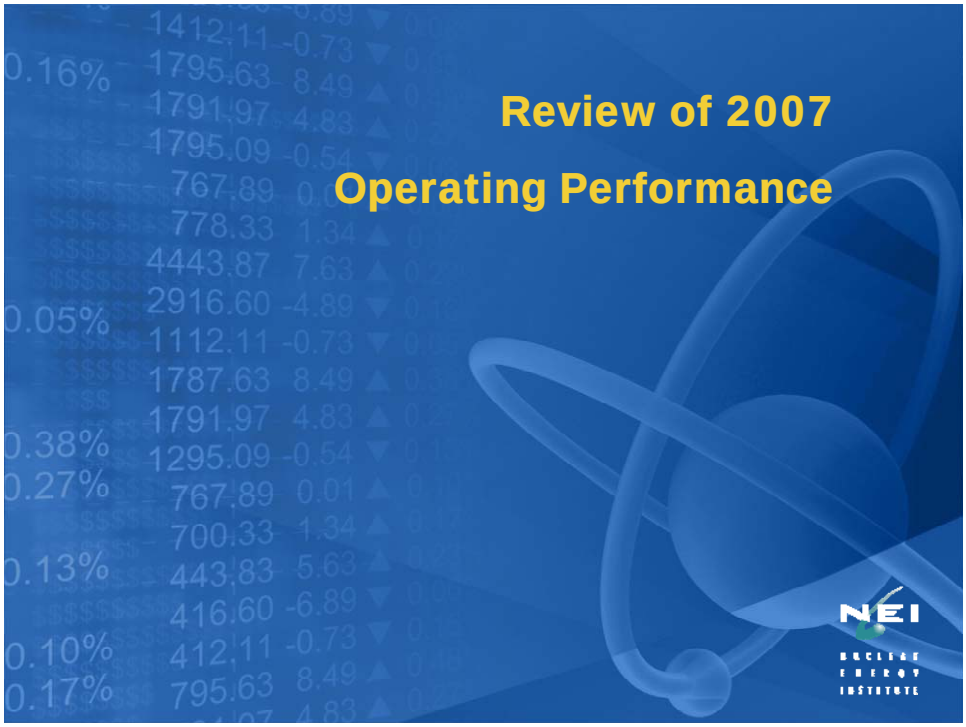
Thank you, John ... and let me also welcome you this morning.

Our focus this morning is on the future, but I'll start with a summary of last year's performance, then turn to where we stand with new nuclear plant development, and what the financial community and others can reasonably expect going forward.

We approach the business of new plant construction as a risk-management exercise, and I want to review with you what the industry has done over the last several years or so to identify,

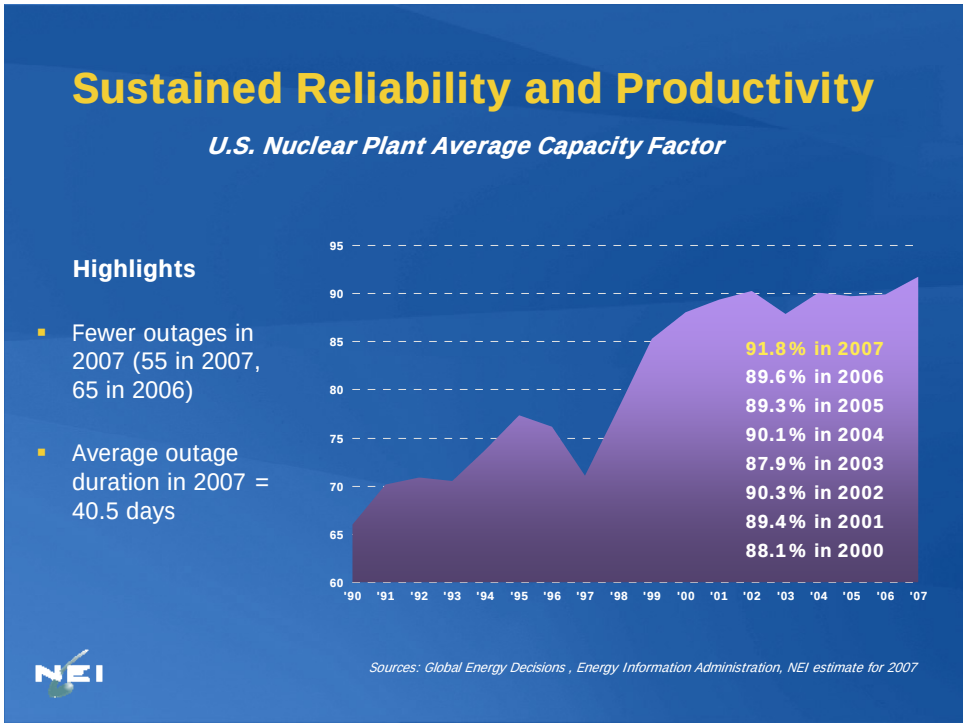
understand and manage the risks associated with new nuclear plants.

And although we have wrung much of the risk out of the business, it’s impossible to drive all risks to zero, so I’ll conclude with some thoughts on challenges still ahead of us.



Last year's performance ...

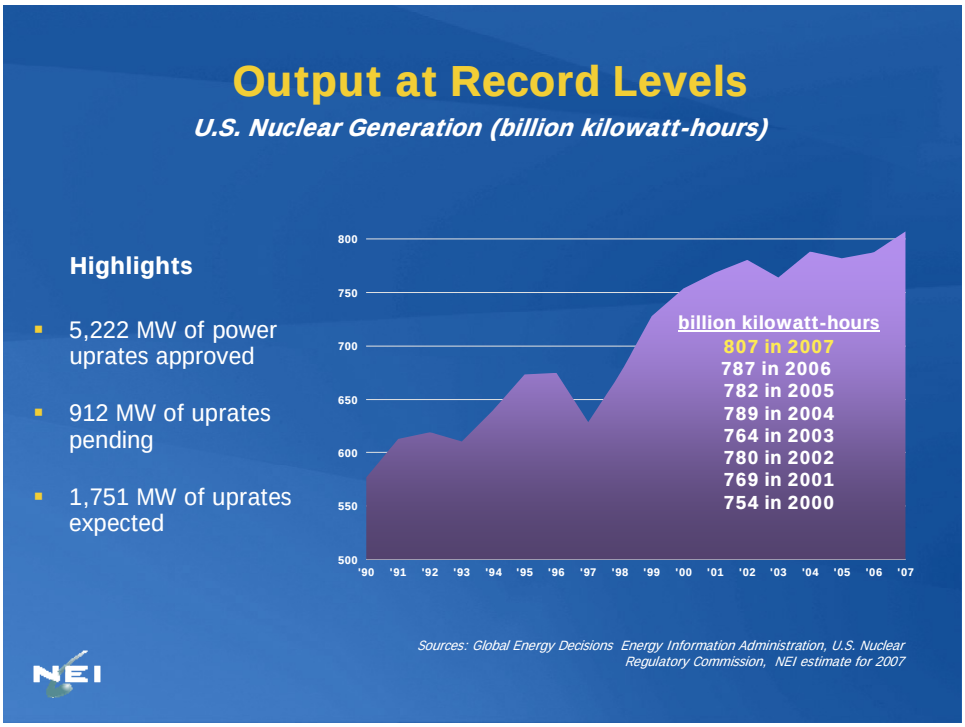
In a word ... outstanding.



We continue to see average capacity factors sustained at very high levels. Our preliminary data show that the fleet last year operated at almost 92 percent, the highest ever.

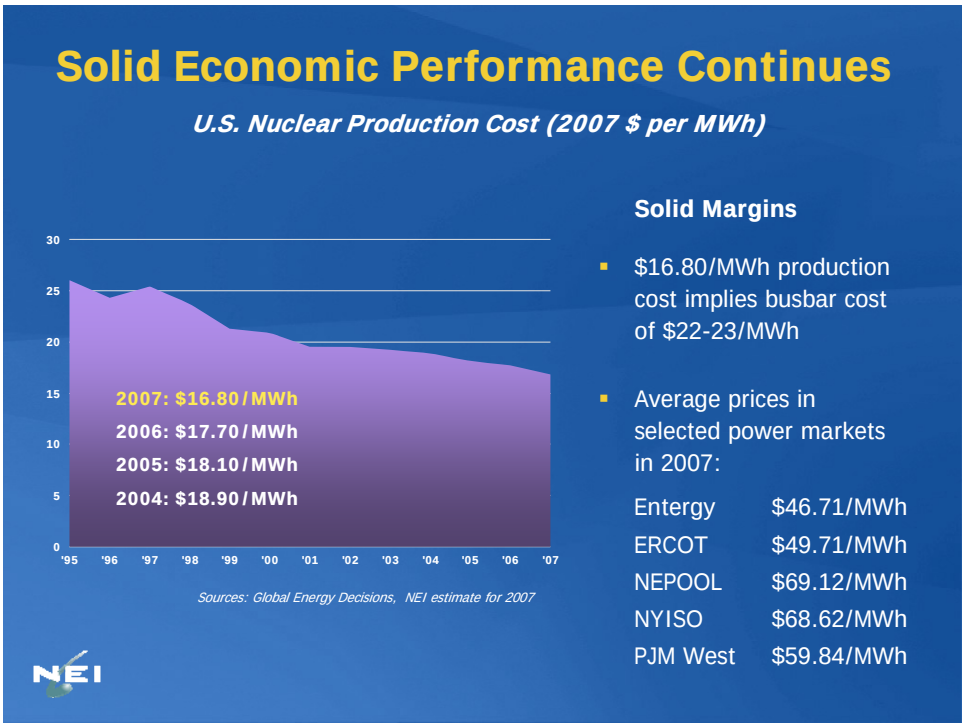
This obviously reflected excellence in plant management and operations, and management of outages.

We were also helped by the fact that we had fewer refueling outages last year than the year before.



We estimate output was at record levels, over 800 billion kilowatt-hours – mostly the result of high capacity factors, but also partly due to more capacity available, both because of power uprates and the restart of Browns Ferry Unit 1 last May.

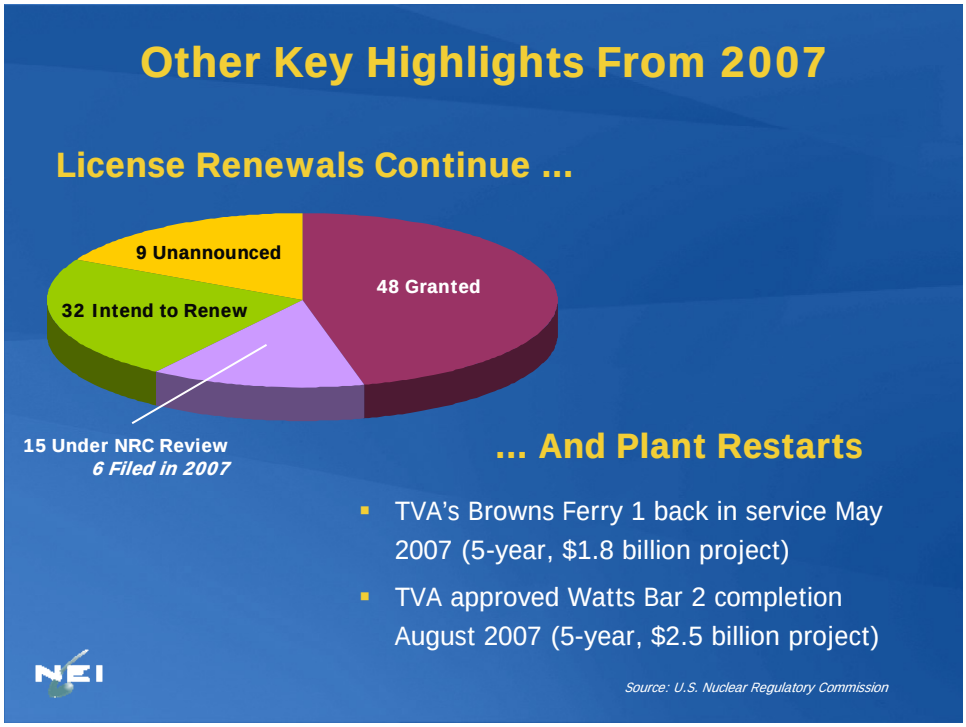
Let me remind you that nuclear power generates nearly 20 percent of U.S. electricity but represents only 12 percent of installed capacity



High output obviously drives economic performance. We estimate production cost last year at $16.80 per megawatt-hour. A record low.

That implies a total busbar cost of around $22 to $23 per megawatt-hour – comfortably below where all major markets cleared.

So these plants generate substantial income and drive earnings and will continue to do so.

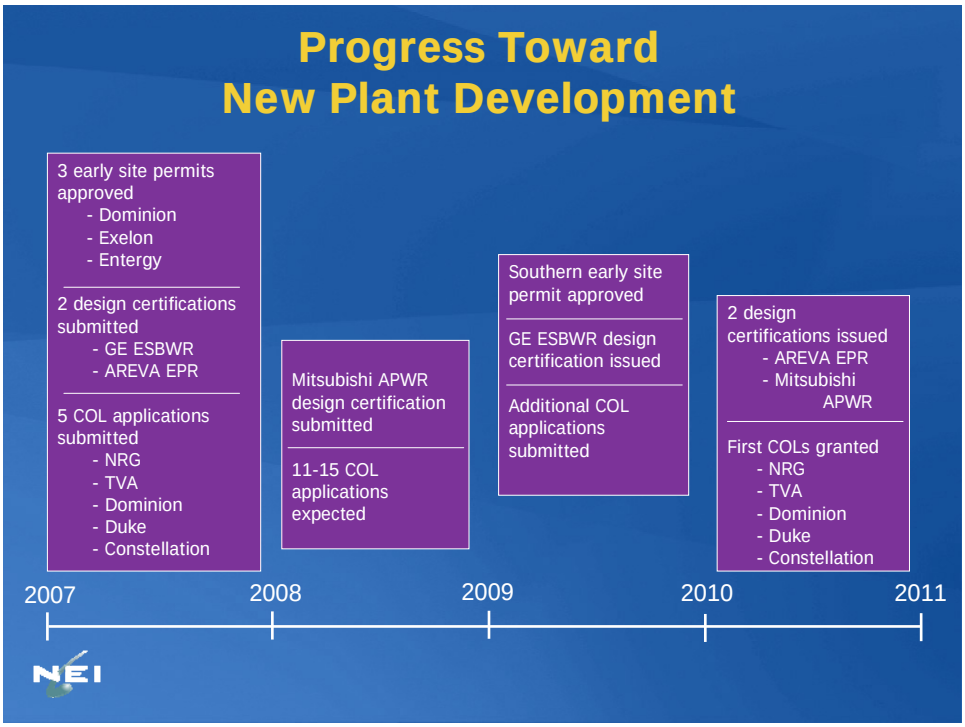


We see sustained progress with license renewal – 63 of the 104 plants have either renewed their licenses or are under NRC review. This is an effective licensing process.

Yes, we are seeing some challenges but we're confident that the license renewal process will be sustained because it is disciplined and legally supportable.

And we saw one shutdown plant brought back into service and construction about to restart on another that was never completed.

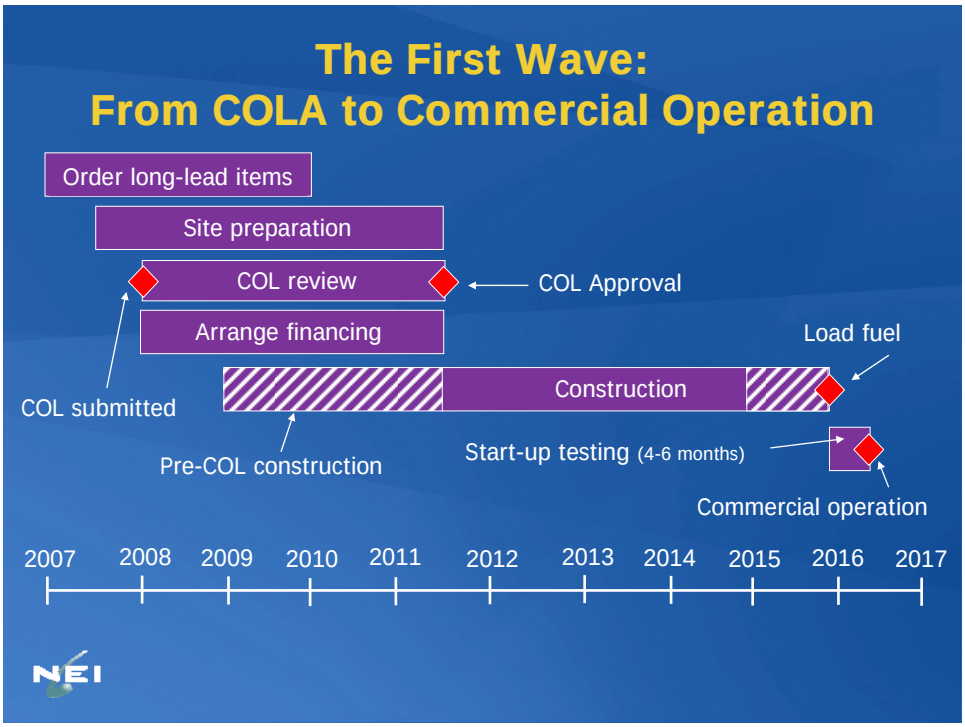
The operating plants clearly represent a solid platform from which to launch the next build cycle. Let me summarize where we stand and what we expect over the next several years.



This slide shows where we stand. Seventeen companies or groups of companies are preparing license applications for as many as 31 new nuclear reactors. Five complete or partial applications for construction/operating licenses (COLs) were filed with the Nuclear Regulatory Commission (NRC) in 2007. Another 11 to 15 are expected in 2008.

Two designs have already been certified by the NRC. Two were submitted for certification last year. One has been submitted this year. Certification means that the design meets all safety standards.

We expect the first COL approvals in late 2010, early 2011.



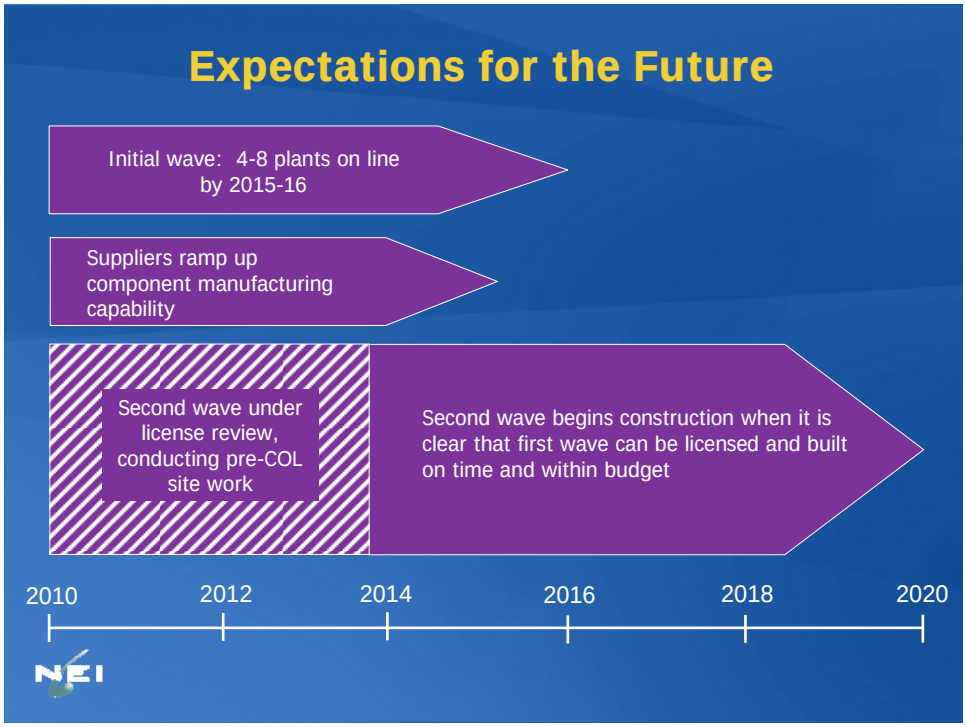
I'll leave you to study this timeline at your leisure. The main take-away: nuclear plant development is not a series-connected process. In order to meet demand for baseload electricity by 2016 or so, the first movers will conduct a number of activities in parallel.

During the period when NRC will be reviewing the COL application, companies will be ordering long-lead items, preparing the site and arranging financing – either through the Department of Energy's loan guarantee program or in consultation with state public service commissions.

Even safety-related construction may begin in parallel with license review. So the time from license submittal to power generation could be more like eight years rather than the oft-quoted 10 years.

The clock started on seven new plants last year.

And we believe the period for review and approval of the COL shown here will be shortened by at least a year with later plants as the NRC gains more experience, and because the plants will be standardized.



John Rowe mentioned the need for reasoned expectations.

A reasoned perspective on the “renaissance” of nuclear power suggests that it will unfold slowly over time. As you just saw, we expect four to eight new plants in commercial operation by 2016 or so.

The exact number will, of course, depend on many factors – forward prices in electricity markets, capital costs of all baseload electric technologies, commodity costs, environmental compliance costs for fossil-fueled generating capacity, natural gas prices,

growth in electricity demand, availability of federal and state support for financing and investment recovery, and more.

If those first plants are working to schedule, within budget estimates, without licensing difficulties, a second wave could be well under construction as the first wave reaches commercial operation.

The confidence gained by success with the first projects will support the decision-making process for follow-on projects.

Given the size and financial exposure of new nuclear projects, and the difficult business conditions in the electric sector, do not be surprised if companies hold back, waiting to see if input costs moderate before making multi-billion-dollar investment decisions.

We should expect changes to project schedules, project ownership and project structure as companies get closer to build decisions. New combinations of companies may line up behind certain projects. Some companies will decide not to move forward. We saw that in late January, when Mid-American Energy decided to suspend development of a new nuclear plant in Idaho.

As I said earlier, new nuclear plant construction is a risk-management exercise. The companies developing these projects will not move forward unless they are confident that they have the risks identified and removed or mitigated. Decisions like Mid-American's confirm this.

Many of the nuclear plants commissioned in the 1960s and early 1970s completed construction in 4 to 5 years with construction costs around 500 million dollars.

By the late 1970s and early 1980s, construction was averaging 10 to 12 years, and construction costs ranged as high as 5 billion dollars.

Something had gone terribly wrong.

In retrospect, it wasn't one thing. It was several. The nuclear plants built after the early 1970s were built under the most unforgiving conditions – caused by these four major factors converging at roughly the same time.

Nuclear technology in the United States scaled up quickly – probably more quickly than was prudent. The industry rocketed from the first 200-megawatt-scale plants to 1,000-megawatt-plus plants in just a few years.

As reactor technology was evolving, so too were regulatory requirements. Throughout the 1970s, the nuclear industry and its regulators learned some painful lessons.

The fire at Browns Ferry Unit 1 in 1975 revealed vulnerabilities and led to new fire protection requirements.

The accident at Three Mile Island Unit 2 in 1979 revealed operational and design-related issues never previously imagined.

After the accident, operating plants and those under construction were swamped in new regulatory requirements. Most of the nuclear plants under construction were overwhelmed by the changing requirements, which forced extensive redesign and rework, stretched out construction schedules and drove up costs.

Changing regulatory requirements and licensing difficulties added to the challenge of managing these large construction projects to schedule and budget. But licensing and regulatory requirements were not the only drivers of cost increases and schedule delays.

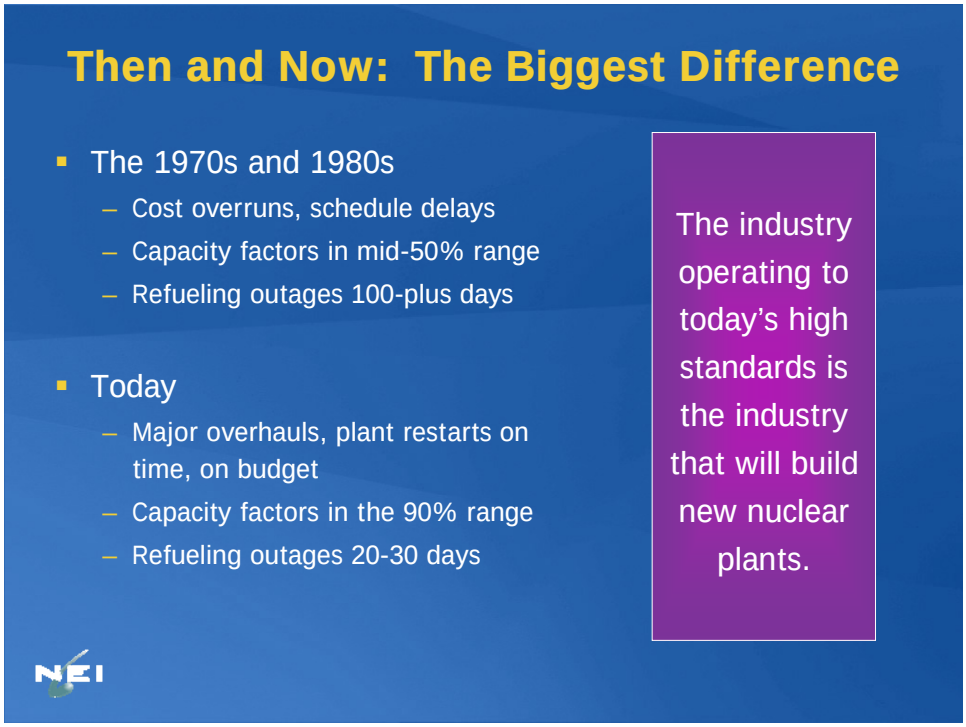
Where we had problems, the industry did not appreciate the scale and complexity of nuclear projects, did not recognize the importance of project management, and was not well-positioned to manage construction.

We started construction before the design was complete. We had too many projects under construction at once. We had companies building plants with no prior nuclear construction experience. We ran into problems when we failed to treat Quality Assurance as a management tool and standard. We did not have project planning and management tools equal to the complexity of the task.

At the extreme, poor construction management was directly responsible for a number of projects being abandoned.

And finally, we were building under difficult business and economic conditions. Growth in electricity demand slowed from 6 to 7 percent a year to 1 to 2 percent. Many utilities intentionally slowed construction. The prime rate hit 20 percent in the early 80s. As project schedules stretched out, costs increased and

companies were forced to borrow more at double-digit interest rates.



The 1980s were somewhat dark days for nuclear power. All of you have heard about – and some of you remember – Washington Public Power Supply System, Marble Hill, Zimmer, Midland, Shoreham.

But remember: back then, the average annual capacity factor of U.S. nuclear plants was in the mid-50-percent range. Refueling outages ran, on average, more than three months.

The companies operating nuclear plants in the United States today, and preparing to build new ones starting in the next decade, are operating to higher standards.

Today’s nuclear industry has learned from the experiences of the past, and those lessons inform everything we do.

We are where we are today because this industry started many years ago on a systematic program to identify what went wrong the last time, and develop ways to eliminate or manage those risks.

In some areas, like licensing, this work goes back to the late 1980s. In 1989, the NRC developed a new approach, under which designs and sites would be approved up front and companies would receive a single license to build and operate. This was ratified by Congress in the Energy Policy Act of 1992.

Last year, NRC finalized its Part 52 rule governing new plant licensing. As with all NRC rules and regulations, the revisions to Part 52 were subject to review and comment by all stakeholders, including the nuclear industry.

We assembled several hundred industry personnel – the top licensing lawyers and licensing engineers in the United States – and they sifted through the proposed rule section by section, sentence by sentence, identifying ambiguities and potential uncertainties, and developing techniques to eliminate them. Part 52 is now a stable, workable platform for new nuclear plant licensing and construction.

We followed the same approach in other areas – financing, for example.

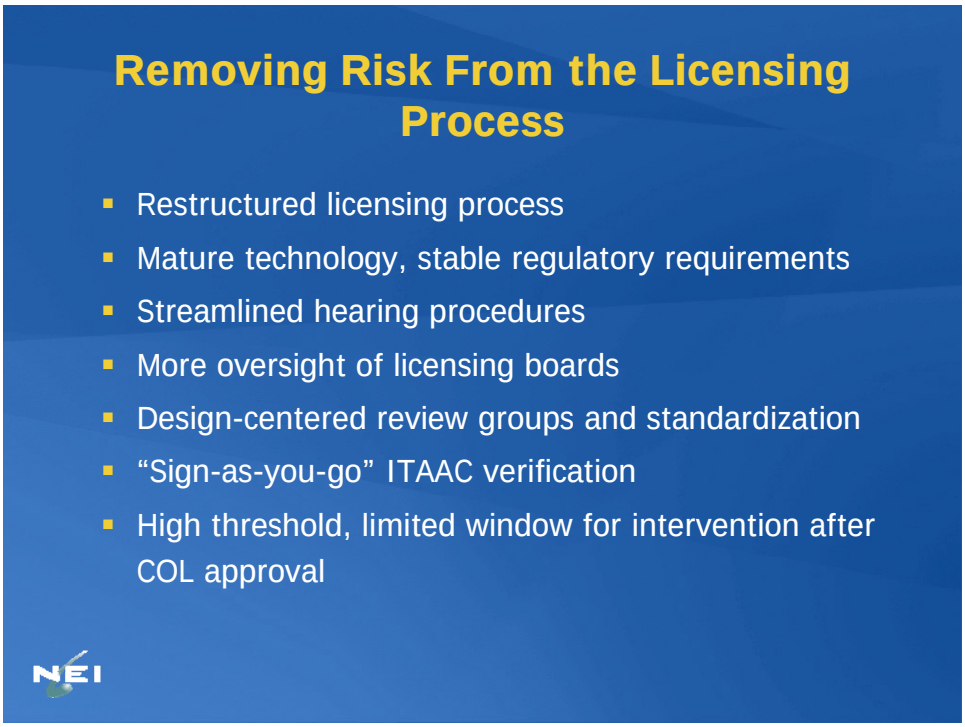
As you know, the loan guarantees in the 2005 Energy Policy Act are critical to new nuclear plant financing. NEI first developed loan guarantee legislation in 2001, saw it included in the 2003 energy legislation that failed to pass, and finally saw the concept enacted in the 2005 energy bill.

I would guess that hundreds, if not more than a thousand, industry experts have been working in earnest since 2000, developing tools, techniques and programs to manage the risk of new nuclear plant construction.

We have mobilized experts in licensing and regulation, financing, construction management, political affairs, public support, supply chain, and workforce.

Seventeen entities developing license applications for up to 31 new reactors did not just happen.

It has been carefully planned.



The new licensing process is markedly different from the old.

The process is restructured to ensure that all major issues – design, safety, siting and public concerns – will be settled before a company starts building a nuclear plant and puts billions of dollars at risk.

The technology is mature. The next plants are light water reactors like the 104 plants operating today. The regulations are stable, well-understood, workable and defined in great detail. Equally important, NRC staff and the industry share a common

understanding of how to comply with its terms and conditions. Nothing like this existed when today's plants were licensed.

Hearing procedures are more efficient than previously. The hearings that preceded commercial operation of today's plants resembled a court trial – full discovery, multiple opportunities to submit motions, extensive and lengthy cross-examination of witnesses. New plant licensing hearings will be less formal, more streamlined, while affording ample opportunity to air any legitimate public concerns.

The NRC had longstanding concerns about the difficulties experienced by Licensing Boards in managing the previous round of licensing proceedings. As a result, the Commission has prescribed requirements for boards to implement hearing schedules and to adhere to them. This emphasis on schedules and accountability obviously reduces risk.

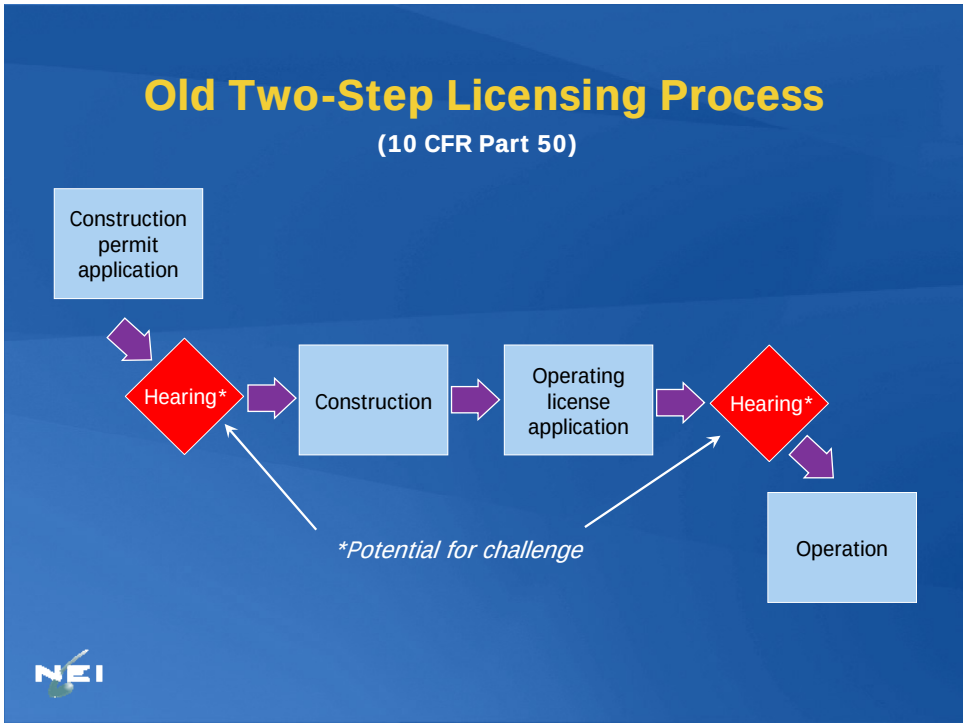
All applications for licenses to build a specific reactor design will be identical – virtually word for word – except for site-specific variations. When the NRC staff has reviewed an issue once, that

issue should not be reviewed again in subsequent applications. This produces greater certainty.

The new licensing process includes a system by which the NRC and the project sponsor can verify that the plant has been built in accordance with the design. This process is known as ITAAC, or Inspections, Tests, Analyses and Acceptance Criteria. A key risk-management tool, the ITAAC are largely unambiguous, quantitative criteria that are spelled out in the COL. A typical ITAAC might be a requirement that a certain pump will deliver a certain flow rate, or that a certain valve will actuate in a specified period of time.

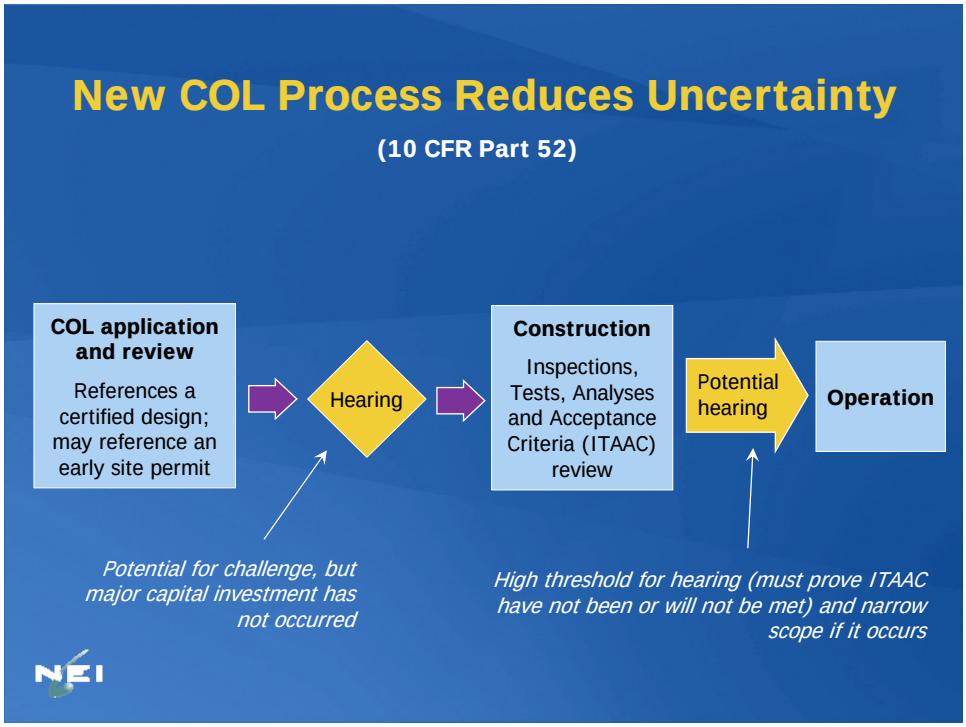
As construction proceeds, the project sponsor will perform the tests necessary to demonstrate that ITAAC have been met, and provide written documentation to that effect to the NRC staff. The NRC staff will review and verify that the ITAAC have, in fact, been satisfied and publish a notice to that effect in the *Federal Register*. This "sign-as-you-go" verification process improves the efficiency and certainty of the licensing process.

And finally, Part 52 establishes a high threshold and a narrow focus for intervention after the COL is approved and construction begins.



Here is the old two-step licensing system. Under this system, electric utilities had to secure two permits—a Construction Permit to build the plant, an Operating License to operate it.

Hearings on applications for operating licenses were complex and contentious. Many completed plants sat idle for years as licensing hearings ground to conclusion.



Here is the new process.

Before the COL is approved and before major capital investment has occurred, the NRC must offer the public an opportunity for a hearing and will review the staff's conclusions in what is known as mandatory hearing.

There is one opportunity for a second hearing as the date for fuel load and initial plant operation approaches. But this hearing, if it occurs, is narrowly focused, and the Commission itself will review contentions to determine whether or not they are admissible.

For a hearing to be granted, petitioners must provide evidence that one or more ITAAC were not, or will not be, met. Intervenors cannot raise issues or contentions already decided in earlier proceedings, nor will vague and unsubstantiated claims be admitted.

The new process provides appropriate opportunities for public participation while protecting project sponsors from inappropriate delays.

Over the last several years, industry teams have conducted systematic assessments of what caused project delays, and developed a detailed inventory of lessons-learned that are shared industry-wide. Future nuclear projects thus have a roadmap for success.

Companies planning to build new nuclear plants will have detailed design complete before construction is started. Engineering and construction schedules will be fully integrated. Each reactor design will be standardized and we have created mechanisms to enforce standardization.

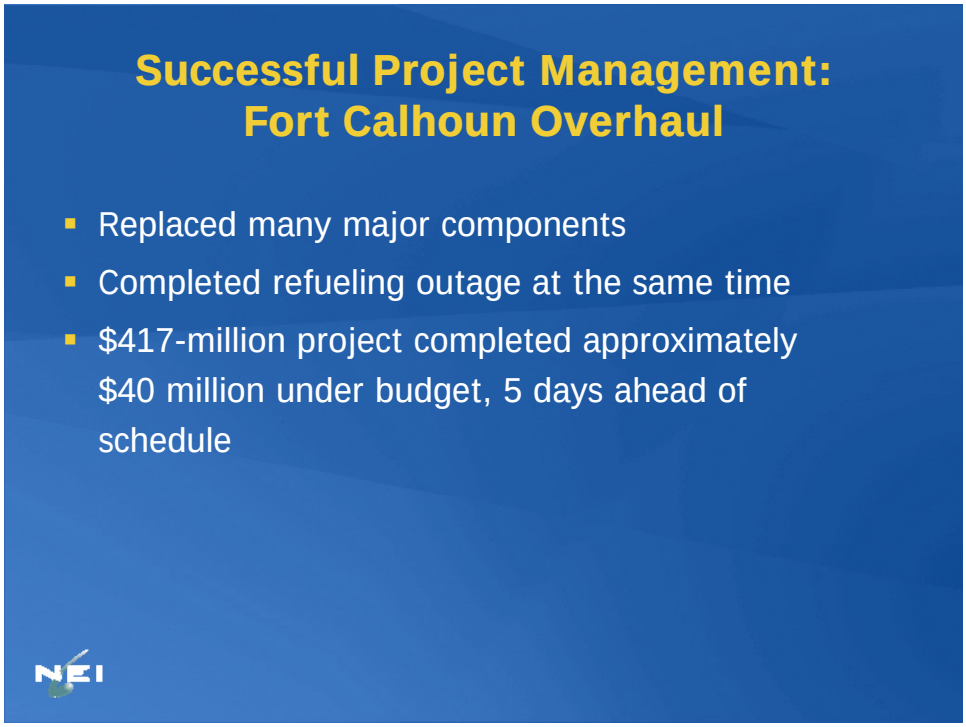
New plant construction will use the same quality assurance tools as the operating plants – disciplined corrective action programs and the same focus on safety culture.

Project management will benefit from a suite of sophisticated construction planning and management tools equal to the complexity of the task, none of which were developed when the last nuclear plants were built. Construction of new nuclear plants will also benefit from improved construction techniques, like modular construction, many developed overseas or in the U.S. nuclear navy.

Recent construction and operational experience at the Browns Ferry 1 plant demonstrates that an experienced project management team can complete projects on budget and on schedule. It takes effective quality assurance and corrective action programs, with detailed design completed before the start of major construction, with an integrated engineering and construction schedule.

Today's nuclear industry has performed projects ranging from major upgrades to plant restarts to refueling outages efficiently, and without delay.

Browns Ferry Unit 1 resumed commercial operation in May 2007, on schedule and within the original accepted budget estimates.



At Fort Calhoun, Omaha Public Power District replaced the steam generators, reactor vessel head, pressurizer, low pressure turbine, main transformer and hydrogen coolers, among other equipment.

The outage, which began in September 2006, lasted 85 days – coming in under budget and ahead of schedule.

The interest in new nuclear plants has led to questions about whether we have the supply chain and work force infrastructure that will be necessary. By infrastructure, we mean supply chain and workforce.

Market studies indicate that the manufacturing supply chain should be adequate for the first wave of new nuclear plants.

Forgings, particularly the ultra-heavy forgings used to fabricate the reactor pressure vessel, are the most visible constraint and the one that has received the most attention. Only Japan Steel

Works currently has the capability to make these 350-ton-plus forgings.

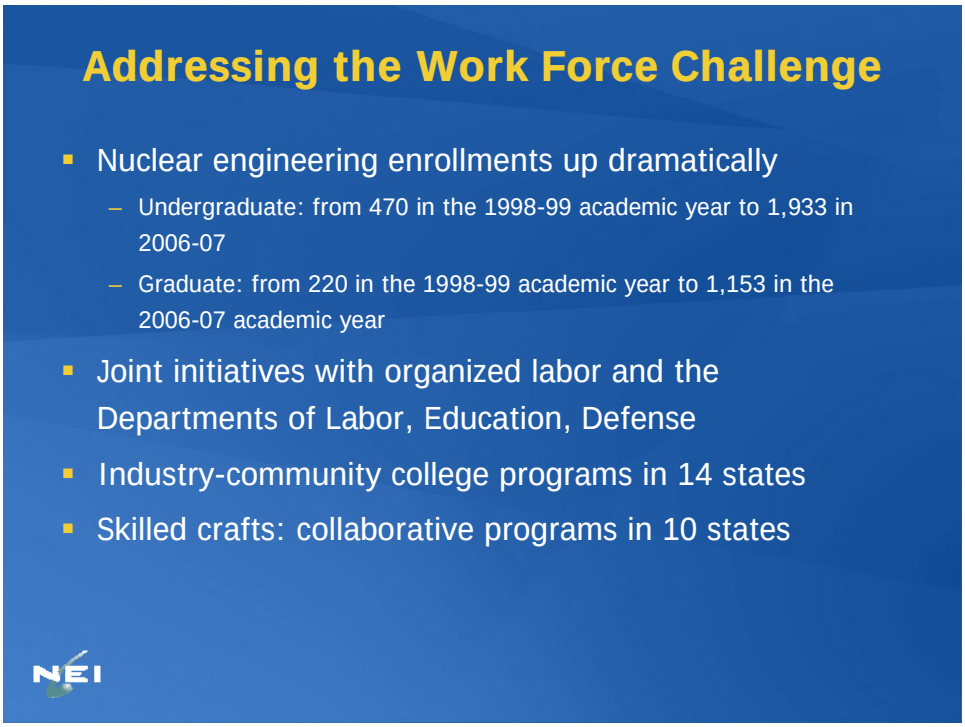
The ultra-heavy forgings for the first wave of U.S. nuclear plant construction have already been manufactured, ordered or companies have reserved a place in the manufacturing queue.

JSW announced last October that it will expand production capacity for these forgings so there is reason for optimism about the availability of forgings for the second wave of new plants.

Companies are taking the first steps toward rebuilding U.S. capability for nuclear-grade component manufacturing. Babcock and Wilcox Co. reorganized last year to position itself for the next wave of nuclear plant construction. Alstom will invest $200-million in a facility in Chattanooga to build turbines.

Other companies are upgrading Quality Assurance programs and taking other steps to obtain their “N-stamps” – the certification by the American Society of Mechanical Engineers that the manufacturer is qualified to produce nuclear-grade components and equipment, and conduct nuclear-grade construction. B&W,

Peter Kiewit, and Fluor, for example, have all renewed their N-stamps in the last year.



We are working with the federal government, state governments, universities and community colleges, high schools, labor unions, utilities, other trade associations and professional organizations to address the workforce challenge.

We are promoting nuclear energy careers and employment opportunities among younger people.

And we're making progress.

As one measure of this progress, at the university level, enrollment in nuclear engineering has quadrupled.

We're working to ensure that the energy sector is represented in government-sponsored programs like the High Growth Job Training Initiative, which was successful in gaining $27 million in grant funding and an award of $2.4 million for training in radiation protection. We participate in programs like Helmets-to-Hardhats. Helmets-to-Hardhats is operated by our partners, organized labor, and funded by the Defense Department. Over 200,000 veterans are registered, so programs like this expand our labor pool significantly.

In the areas of radiation protection, operations, and maintenance, 17 industry-community college collaborative training programs have been launched, most within the past three years, to bring younger workers into these fields.

To attract workers to skilled craft careers and provide appropriate training and education, the industry has participated in the formation of 10 state-based consortia and other collaborative arrangements among state governments, industry and academia.

Like all new generating capacity, there is considerable uncertainty about the capital cost of new nuclear generation. As with virtually everything these days , we are working in an evolving cost environment for basic commodities and labor. Project sponsors and suppliers are now negotiating terms and conditions so we should have more clarity very soon.

New baseload generating capacity – nuclear or coal – will be expensive. These are large, capital-intensive projects.

Financial analysis shows, however, that new nuclear plants can deliver electricity in the range of $70 to $80 per megawatt-hour,

when they come to market starting around 2016, assuming credit support from the federal government in the form of loan guarantees or supportive rate policies at the state level. Analysis by NEI and others shows that this would be competitive with other options – coal-fired or gas-fired.

Implementation of the federal loan guarantee program is going well. And as you know, a number of states in the South and Southeast have passed legislation providing companies incentives to build new nuclear capacity and providing assurance of investment recovery.

A few closing thoughts on the road ahead ...

Like any industry, and especially those working to meet future energy requirements, we face uncertainties.

We have a high degree of confidence that the new nuclear plant licensing process is well-structured and will work as designed but it has never been tested and we cannot guarantee zero risk.

We face changes in the White House and in Congress.

We find ourselves operating in an evolving cost environment, which makes it more difficult for generating companies, reactor

suppliers and EPC contractors to come to terms. But we are getting there with precision.

And finally, these are large capital projects relative to the size of the companies that will build them, which brings additional complexity to the table.

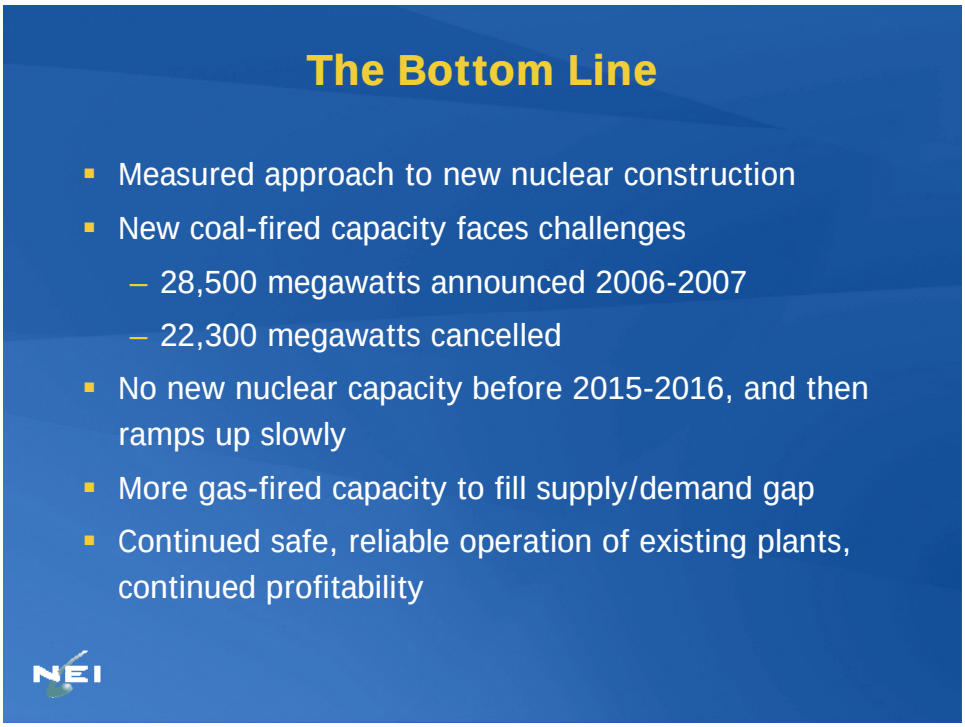
On the other hand, we think the uncertainties are manageable.

The licensing process is indisputably more efficient and predictable than when we last built nuclear plants in the United States.

Equally important, we understand what went wrong the last time and, as you've heard this morning, we've taken steps to remove or mitigate those risks.

There's no doubt this nation needs new baseload generating capacity.

We enjoy good bipartisan political support, and strong support from the public. We have solid support from organized labor, which obviously helps in the political world. And we see growing acceptance of nuclear power in the environmental community, driven by concerns over climate change and carbon emissions.



Our view of the future, then, is positive and grounded in reality.

We understand the risks associated with new nuclear plant construction and we have taken steps, implemented programs and, where necessary, overhauled the system to mitigate and remove those risks.

We will take a measured approach to new plant deployment.

<u>Better to do it right than do it fast.</u>

The uncertainties associated with nuclear power are no larger than the risks facing the other options for baseload electricity. We have worked carefully to identify those uncertainties.

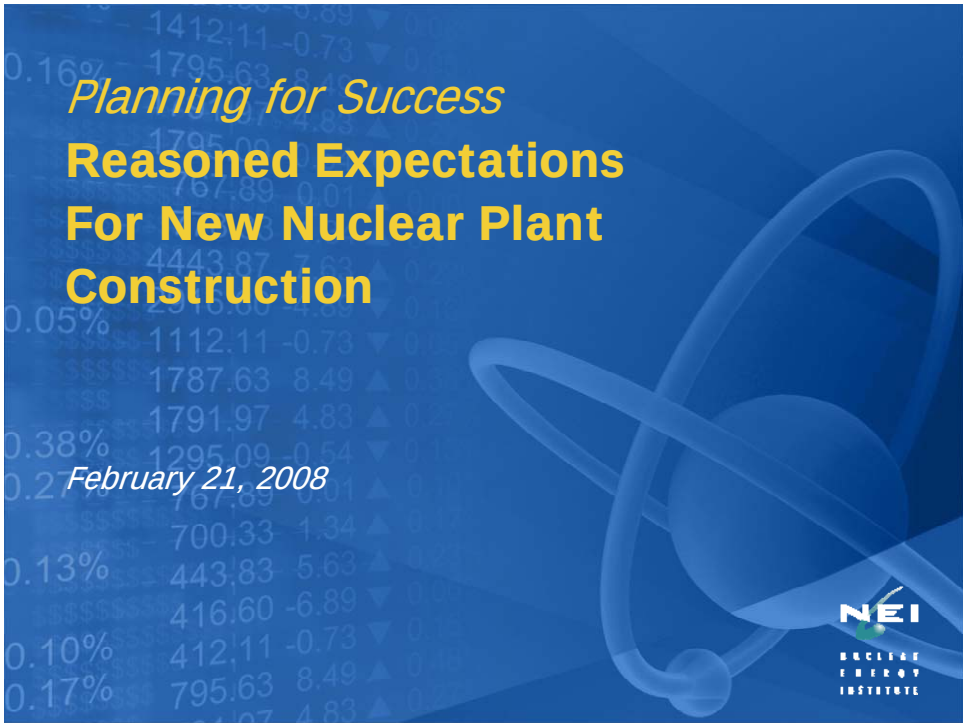
New coal-fired capacity has its own challenges, and only some of those are identified and understood. That helps explain why 28,500 megawatts of coal-fired capacity was announced in 2006 and 2007, and 22,300 megawatts of coal-fired capacity was postponed or cancelled.

But since new nuclear deployment will ramp up slowly, and since companies cannot predict future constraints on carbon emissions, we see the United States burning growing volumes of natural gas to meet demand for electricity.

More gas-fired generation will place additional strain on gas supply and, I fear, will drive even more jobs in the chemical and fertilizer industries offshore.

As we move toward construction of new nuclear plants, the financial community can count on two things. First, we will maintain our commitment to continued safe and reliable

operation of our current fleet. And second, with gas on the margin in more markets more of the time, our operating plants will continue to drive earnings and profitability.



That concludes this year's briefing. Thanks again for joining us this morning. We'd be happy to take any questions.