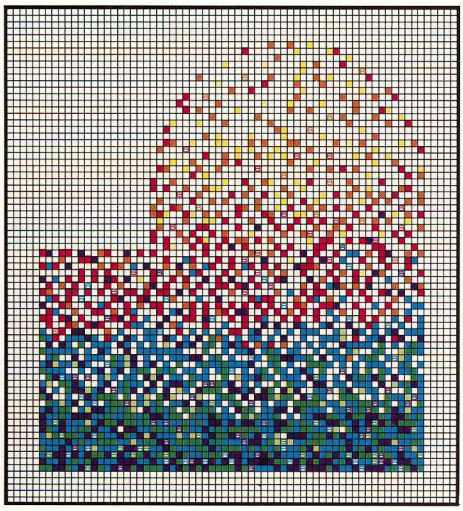


PROGRESS THROUGH PARTNERSHIP

ACHIEVING PLANT CONSTRUCTION IN SIX YEARS

It's time for some straight talk about the future of the U.S. nuclear industry. If the nuclear option is to maintain its place in meeting America's increasing energy needs, plant construction projects must become considerably more efficient and economical.

Plant construction, past and present, has been analyzed and criticized long enough. The causes and the effects of construction delays and cost overruns are clear. Every utility and every nuclear supplier knows the pitfalls, the challenges and the financial risks involved in plant construction.

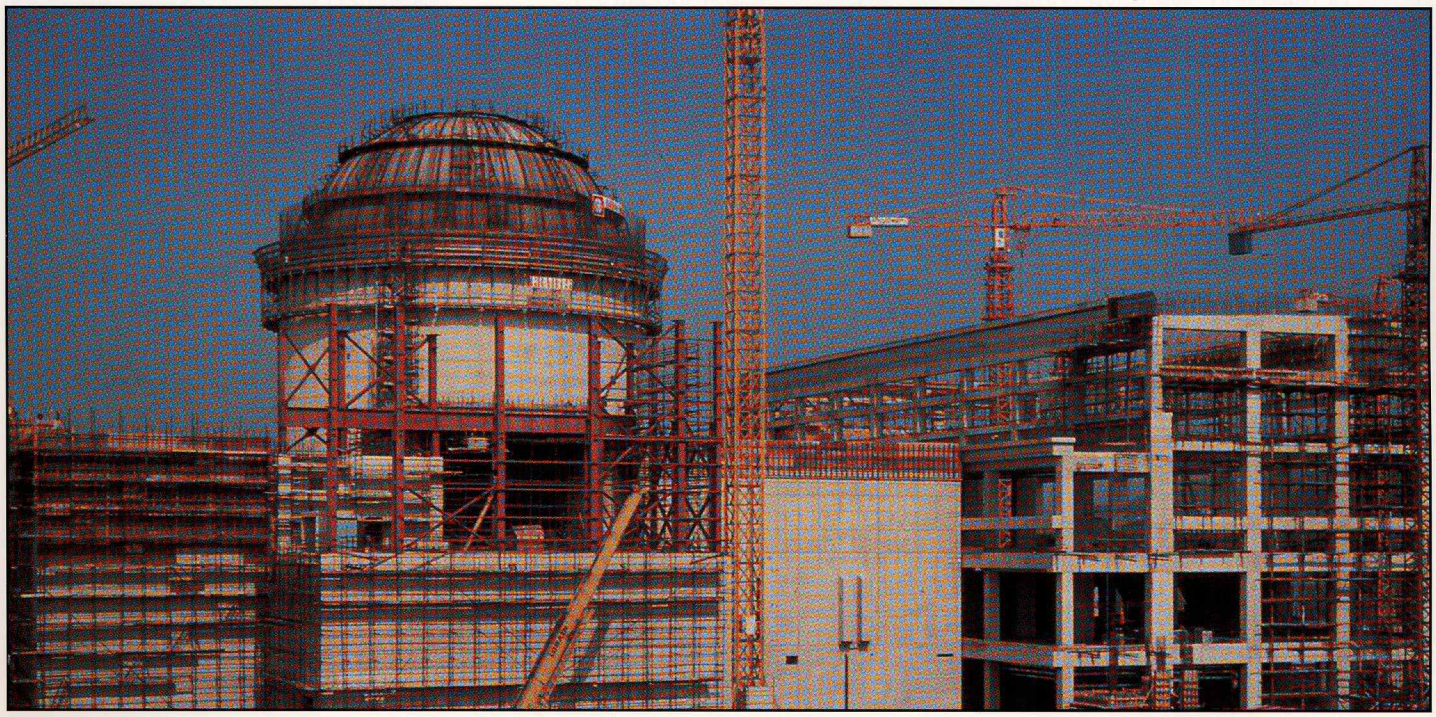
The industry has learned the value of time. Anything that adds time to a project – lack of cooperation and incentive among parties, incomplete designs, drawn-out licensing procedures, rework and backfits – ultimately increases the cost of the finished plant and threatens to make the nuclear option a less desirable choice.

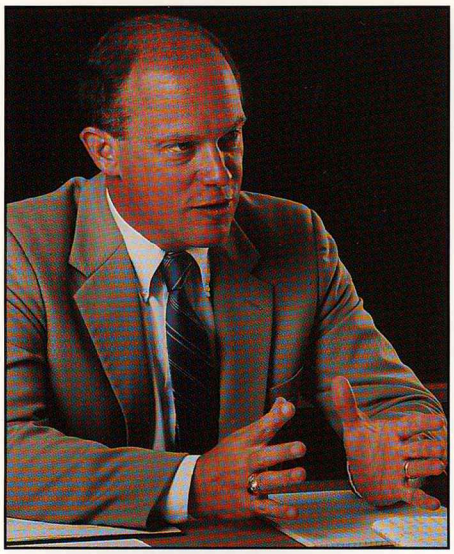
Thirty years of social, political and economic change in the United States have contributed greatly to the current state of the industry. Learning from the negative, as well as the positive changes, will be the solution to turning the industry around.

"The problem in the industry has not been change. It has been the management of change," says Nat Woodson, General Manager of the Westinghouse Nuclear Operations Division. "The industry hasn't always dealt with change in the best possible way.

"We are no longer doing business in the 1960s or early 1970s. America has changed significantly. We must redirect our activities. It is obvious that this society will not support or endorse another 10- to 15-year nuclear construction project."

Westinghouse constructed Yugoslavia's KRSKO plant on a total turnkey basis. The plant was built within a 72-month schedule.





The Six-Year Plan

According to Woodson, a six-year plant project would be ideal.

Such a plant already exists. Project managers overseas and in the United States have constructed plants in six years or less. For example, Korea Electric Power Company built Korea Units 5 and 6 in 60 and 64 months, respectively, from first concrete pour to core load. Taiwan Power Company constructed Maanshan Units 1 and 2 in 66 and 69 months, respectively, based on the same milestones. During the past 15 years, as a total turnkey and nuclear island turnkey supplier, Westinghouse has produced 20 plants on average construction schedules of 61 months. One U.S. utility, Florida Power and Light, overcame post-TMI constraints to construct St. Lucie Unit 2 within six years.

Clearly, the methodology and technology for building such a plant already exists. What does not exist is an industry-wide commitment to make it happen consistently in the United States.

"Let's not kid ourselves," says Woodson. "We have never achieved real teamwork in the U.S. nuclear industry."

The electric utility is no longer the sole decision-maker for building new baseload generation. In the past, the utility decided when to build, where to build and how much to build. Today's nuclear projects are dictated by a much larger cast – the utility, its supply organization, financial groups, state and federal regulators – each with the potential to make or break the project by what it contributes.

"Time needs to be managed. Westinghouse sees partnership as the one and only solution for managing time."

Nat Woodson, General Manager, Westinghouse Nuclear Operations Division

"Time needs to be managed," according to Woodson. "Westinghouse sees partnership as the one and only solution for managing time. Today's utility needs the support and cooperation of its supply organization and all of its external decision-makers in order to plan a six-year schedule and stick to it.

"We're not describing a commercial relationship in which we call ourselves partners when we really mean favored suppliers. We're describing partnership in its classic sense – a business relationship which involves the mutual sharing of risks in the mutual expectation of a benefit."

The key link between "risk" and "benefit" is "incentive." For the six-year plan to work, each partner must assume a financial or political risk. Each must have the incentive to do whatever is necessary to keep the project on schedule and within budget. Ultimately, each partner will share the benefits of a safe, reliable nuclear unit.

Getting Ready To Build

The Westinghouse approach to six-year plant construction is focused on anticipating and defining the needs and costs of the project before making a long-term commitment. It is designed to accomplish as much as possible prior to substantial financial investment. It is aimed at minimizing risks once the funds are committed.

In short, plant designs and construction decisions must be confirmed long before the first shovel ever breaks ground.

All of these activities will, of course, hinge on two major determinations: whether or not the need for increased generating capacity exists and whether that need warrants a new plant construction project.

"Utilities are well aware that there will be a substantial need for increased baseload capacity in various regions of the United States as early as 1995," says Woodson.

Examples of Westinghouse Six-Year Successes

Project/Country	Schedule (Months)	Westinghouse Scope
KRSKO – Yugoslavia	72	Total Turnkey
Napot Point – Philippines	69	Total Turnkey
KORI 1 – Korea	60	Total Turnkey
KORI 2 – Korea	63	Nuclear Island Turnkey
Takahama 1 – Japan	46	Nuclear Island Turnkey
Ringhals 3 – Sweden	58	Nuclear Island Turnkey
Ringhals 4 – Sweden	58	Nuclear Island Turnkey
OHI 1 – Japan	61	Nuclear Island Turnkey

Based on First Concrete to Ready for Core Load

"Although utilities have been reluctant to enter into new construction projects, based on some of the construction problems of the recent past, I believe that most utilities endorse and support the safety, high availability and low fuel costs of the industry's present operating nuclear plants. We hope to see more such plants in the future, by proving that new plants can be built in six years.

"However, before any new construction project can even be considered, the utility must first establish and define its future power needs and obtain the endorsement from the state authorities that the need is real and that it justifies additional base-load generation. Reaching this mutual decision begins with early and frequent communication among the utility and its authorities."

Establishing the need for power is a logical starting point for the utility. Unfortunately, this determination hasn't always been clearly defined and agreed upon during the early stages of many previous projects. Since state regulators have the authority to prevent a proposed plant from being built, to cancel a project or to prevent construction costs from entering the rate base, it is absolutely essential that these decision-makers support the utility's positions.

Consider the case of Pennsylvania Power and Light's Susquehanna Unit 1. The Pennsylvania Public Utility Commission disallowed millions of dollars of the plant's construction costs from entering the rate base because the PUC felt that the unit provided excess capacity. In the case of Philadelphia Electric's Limerick Unit 2, the Pennsylvania PUC has tried repeatedly to cancel the project on the grounds that it fulfills no apparent need.

These types of situations can be avoided only by obtaining a clear understanding among the utility, the state authorities and the community that the need for power exists. Once that need is agreed upon, the utility can begin to think seriously about an actual construction plan.

The utility should advise the state and local authorities of its building plans as early as possible and keep them informed throughout the entire planning process. The authorities do not have to make a firm commitment to construction at this early stage, but they should be willing to approve the costs of the planning and engineering tasks.

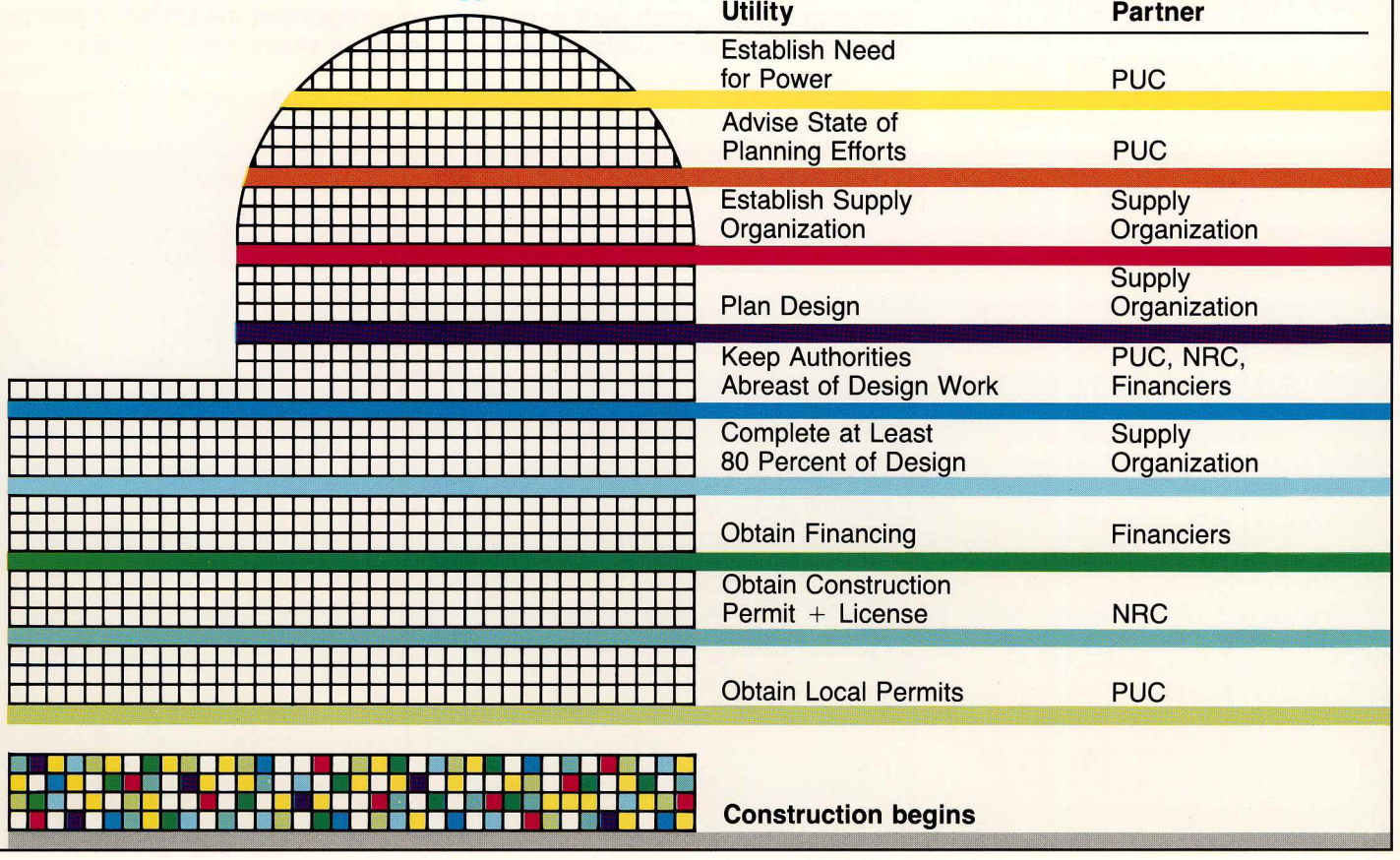
With the need for power established and the planning efforts endorsed, the utility has taken a big step toward eliminating unnecessary costs, cancellations and uncertainties down the road.

The Value Of The Supply Organization

The next stage in the utility's planning process includes the selection of a qualified, experienced supply organization – one that will share the utility's project risks and benefits by defining a scope of work, taking responsibility for managing that scope and performing high-quality work within the agreed-upon schedule and budget. The risks and the benefits provide the incentive to meet these objectives.

Clearly, the utility will no longer bear financial risks and construction uncertainties on its own. That is why it is so important to choose a

Pre-Construction Methodology



Westinghouse constructed Korea's KORI 2 on a nuclear island turnkey basis. The plant was built within a 63-month schedule.

responsible supply organization. The utility may choose a turnkey or energy systems supplier like Westinghouse, with various sub-tier suppliers, or a joint venture composed of several suppliers. Either way, the utility should expect all its major suppliers – project manager, architect-engineer, NSSS supplier, civil contractor – to join together and to share the risks for their respective scopes of work.

"Westinghouse will agree to perform its scope of work under a risk-sharing mode of operation, and we will expect the project's other suppliers to follow suit," says Woodson. "The six-year plant will not be achievable unless risk-sharing contracts are followed by all suppliers.

"Since financial rewards are based on performance, only those suppliers whose outstanding efforts keep the project on schedule, within budget and to agreed-upon standards should gain the maximum return. That maximum should be enough of a carrot to keep the rabbit running at full speed toward a six-year plant.

"If the schedule slips, or if any element in the supply organization fails to meet its commitments, the supply organization will have the incentive to remedy the situation."

The risk-benefit approach is aimed at meeting schedules and keeping costs to a minimum. Those are, after all, the major concerns of any state public utility commission or financial institution.

"In determining whether or not to finance a new plant, the financial community is primarily concerned with the types of economic, regulatory and political risks involved during the duration of the construction," says Robert G. Hildreth, Jr., Managing Director of Merrill Lynch's Capital Markets Group – the same group that developed the innovative "Newbrook" financial package for the Seabrook plant.

"The utility and its suppliers can help reduce those risks and assure efficient construction by working closely with financial groups during the early design stages of the project. The utility should, at various stages, keep the financial community aware of its plans. That way, financiers can let the utility know, as early as possible, whether or not they feel the construction plan is feasible to justify the necessary financing."

A Proven Design

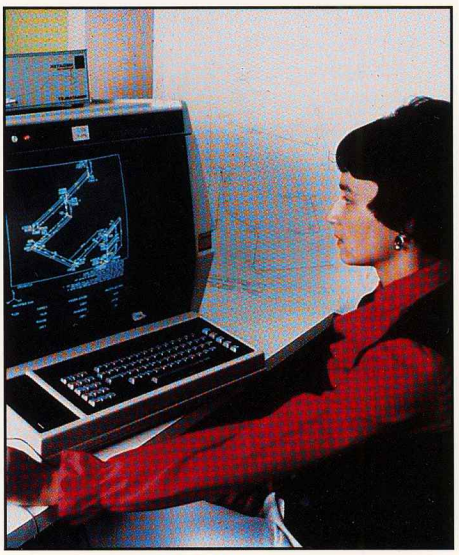
A good plant design – one which is at least 80 percent complete before construction – will not only gain the support of the financial community, but will also assure future cooperation and commitments from the Nuclear Regulatory Commission and the state public utility commission. Plant design should be "frozen" as much as possible. This will reduce, and ideally eliminate, future backfits and rework. The completed design will also help prove to the public utility commission that the utility has taken great preparation to assure efficient construction.

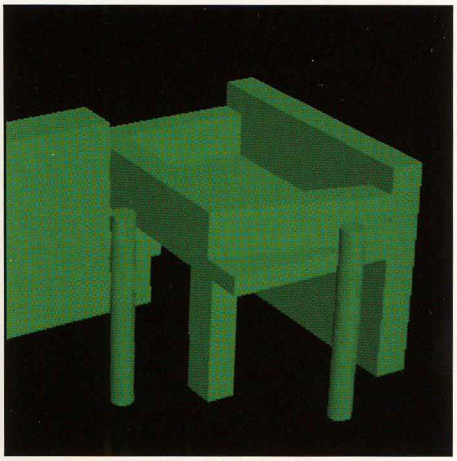
Westinghouse recommends that the utility and its supply organization base the design on a reference plant, then work together to adapt the reference design to the specific site and utility needs.

"The financial community will have a lot more faith that the project will be completed on schedule if we see that the utility is following a reference design," says Hildreth.

One-Step Licensing

Fortunately, the NRC has taken significant steps toward reducing many of the regulatory uncertainties that became so prevalent in the aftermath of Three Mile Island. The Commission has recently approved the long-awaited backfit rule, which will help prevent the implementation of any backfit that does not provide a substantial increase in public safety.





Three-dimensional plant models facilitate the engineering, design and qualification processes.

According to Nunzio Palladino, Chairman of the NRC, "During my tenure as chairman, I have sought a new system of backfit controls that would require that a backfit is analyzed and that an explicit judgment of its safety and cost consequences is made. This new rule does just that."

Commissioners Zech and Roberts have stated, ". . . this backfit rule provides a disciplined review. . . to assure that there is a rational basis for modifications. . ."

Another note of optimism is the Nuclear Power Plant Licensing and Standardization Act of 1985, a bill which has been drafted by the NRC and submitted to Congress. The goals of the bill are "to provide an accurate, efficient, and more effective licensing process for the design, siting, construction and operation of nuclear power plants."

This bill supports one of the major time-saving elements of the Westinghouse six-year construction plan: one-step licensing. Completeness of design – including the qualification of layouts, systems and components – prior to construction will permit the combined approval of the construction permit and the operating license.

Westinghouse believes that a key ingredient to success is the early identification and resolution of potential risk issues. One objective is the development of a quality assurance program, in which the NRC would follow a "sign as you go" approval process on quality items during construction. This would reduce the potential for any quality assurance issues or last-minute allegations that may arise during the licensing hearing. Westinghouse has discussed this concept with NRC executive management and has found them quite receptive to the idea.

Simplification of plant design is another key way to shorten construction schedules. Working with the NRC and the Westinghouse Owners Group, Westinghouse is identifying and documenting the impact of regulations that have either increased or not reduced risk potential. This process has resulted in decisions reducing the need for snubbers, pipe whip restraints and jet shields.

Time-Saving Tools

All of the extensive pre-construction engineering activities necessary to assure complete design and one-step licensing require the most advanced engineering tools. Since the quality and efficiency of the pre-construction activity will be a critical factor, not only in obtaining licensing, but also in acquiring subsequent financial and PUC support, the utility should make every effort to invest in proven technologies which can facilitate engineering and design activities. Westinghouse has developed several such technologies.

Programmed Regulatory Compliance, a computer-based tool, promotes the cost-effective management of regulatory compliance by providing the means to quickly identify design variations, to quickly access and identify regulatory compliance data and to assure the consistency and timeliness of data.

Information on design work and its impact must be immediately available to all key personnel at all times. Westinghouse has developed a software tool which provides "visualization" as well as engineering qualification of all data and design work during all phases of the process. The combination of an extensive engineering database and computer-aided engineering system enables the creation of three-dimensional plant models. These models provide structural layout, equipment location, the design of distributive systems, interface studies and material lists and also facilitate subsequent qualification, cost-estimating, procurement and scheduling activities.

Providing The Proof

All of these pre-construction activities – design completion, one-step licensing, computer-aided engineering – have a common purpose: to achieve the six-year construction schedule.

When the appropriate level of plant design is completed and the means to achieve it are established, the utility will begin presenting its work to various external decision-makers. Since the supply organization will have worked in close cooperation with financiers and regulators during design development, it will be in an excellent position to assist the utility in acquiring the financial package and construction permit/operating license and to share any related risks. The decision-makers will all want assurance that the six-year schedule will be met. The results of this extensive pre-construction activity should supply that proof.

If, at this point, the public utility commission determines that the plant should not be built, the utility can cancel the project without having made a major investment. However, if there is a confirmed agreement that the plant is needed, if there is a proven methodology for building within the six-year schedule and if there is agreement by all parties to adhere to that methodology, the utility is in a strong position to make the plant a reality. The financial package has been approved, the combined license has been issued and construction can begin.

A Six-Year Investment In The Future

Westinghouse is confident that the six-year plant can be built in the United States. The need for power exists. The performance of nuclear technology is proven. The industry has learned the value of time and knows that it takes partnership to manage it.

The time for retrospectives and recriminations is over. The time for action is now.