STRATEGIC PLAN FOR

BUILDING NEW NUCLEAR POWER PLANTS

NUCLEAR POWER OVERSIGHT COMMITTEE

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FOR BUILDING

NEW NUCLEAR POWER PLANTS

NUCLEAR POWER
OVERSIGHT COMMITTEE

November 1990

NUCLEAR POWER OVERSIGHT COMMITTEE

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MESSAGE FROM THE CHAIRMAN

The United States faces two serious energy problems. The first involves this country's dangerous, growing dependence on imported oil, which now represents more than half of U.S. oil consumption. The second is ensuring the adequate, reliable, affordable supplies of electricity over the long term as needed to sustain U.S. economic growth and a rising standard of living for all Americans.

These two problems are closely related. Between 1973 and 1989, virtually all new electric supply came from coal-fired and nuclear energy plants. These plants made possible a dramatic reduction in the amount of oil burned for electricity production. Today, however, only a handful of new coal and nuclear plants are still being built--far fewer than needed to meet projected growth in electricity demand. Many electric utilities are reluctant to consider ordering new nuclear plants because of the many regulatory and financial uncertainties and risks they have experienced over the last 10 to 15 years. As a result, some utilities are turning to existing oil-fired plants and using more imported oil.

Given America's need for adequate electricity, energy security and a clean environment, we must reverse this trend and renew our commitment to secure, plentiful, domestic sources of electricity like nuclear energy.

A Position Paper prepared by the Nuclear Power Oversight Committee* reviews the benefits of nuclear energy (including its role in displacing imported oil and protecting our environment), discusses the negative consequences of not building new nuclear plants, and reviews the obstacles that stand in the way of new nuclear plant orders.

Providing the new electric supply that will be needed in the 1990s is a complex undertaking. It will require the balancing of many risks, many uncertainties and many competing interests. No single fuel can satisfy all circumstances. Fuel diversity is one of the great strengths of the U.S. electric supply system, and nuclear energy has a key role to play.

The electric utility industry wants to include nuclear energy in its planning for new capacity. Specifically, the industry has set a goal of ordering and building new nuclear plants within the next several years; so that they may be on-line by the end of the decade or soon thereafter.

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* A Perfect Match: Nuclear Energy and The National Energy Strategy, Nuclear Power Oversight Committee, November 1990. This is an update of an earlier NPOC Position Paper, Nuclear Energy For the Future: What We Must Do, published in January 1989.

Many questions must be answered and many issues resolved before electric utilities will be able to order new nuclear capacity. This Strategic Plan, developed by an Ad Hoc Committee created by the Nuclear Power Oversight Committee, creates a framework within which new nuclear plants may be built.

This plan is an expression of the nuclear energy industry's serious intent to create the necessary conditions for new nuclear plant construction and operation. The industry has assembled a comprehensive, integrated list of all the actions that must be taken before new plants will be built. Perhaps more important, it assigns responsibility for managing the various issues, and sets timetables and milestones against which we can measure progress.

All elements of our society--government, industry, academia, environmental groups, political organizations and others--must work together to ensure the United States increases its reliance on secure, domestic fuel sources. Nuclear energy gives America the power of independence. Working together, we can ensure a major role for nuclear energy in this country's energy strategy, and a bright future for America in the years to come. With this Strategic Plan, the nuclear energy industry makes an earnest commitment to do its part.

Sherwood H. Smith, Jr.

Chairman
Nuclear Power Oversight Committee
and
Chairman, President, and Chief Executive Officer
Carolina Power and Light Company

AD HOC COMMITTEE FOR NPOC STRATEGIC PLAN

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President and COO, New York Power Authority

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President, ABB-Combustion Engineering Nuclear Power

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President, American Nuclear Energy Council

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Michael Wallace
Vice President Nuclear, PWR Operations, Commonwealth Edison Company

Bertram Wolfe
Vice President and General Manager, GE Nuclear Energy

John B. Yasinsky
Executive Vice President, Power Systems, Westinghouse Electric Corporation

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SECTION I: EXECUTIVE SUMMARY

THE NEED FOR A PLAN

The Nuclear Power Oversight Committee (NPOC) has developed a Strategic Plan with the goal of being able to order new nuclear power plants by the mid-1990s, which could be built and operating to meet electricity demand by the turn of the century. Section II of this report presents an outline of the plan. Section III provides detailed action plans. The Strategic Plan, when successfully executed, provides an institutional framework within which future advanced nuclear plants could be built with confidence.

NPOC has developed this plan because it is convinced that the United States will need additional nuclear power plants in the 1990s and beyond. There is increased urgency to meet this need because:

- The projected shortfall in baseload electric generation capacity in the mid-1990s is becoming more certain.
- New requirements for air pollution controls on coal plants, such as those identified in the new amendments to the Clean Air Act, will increase the cost and regulatory uncertainty of electricity generation from coal.
- Although today's operating nuclear plants have greatly reduced the use of imported oil in electricity generation, imported oil usage is growing again in the electric sector. New nuclear plants are needed to reverse this unfortunate trend.
- Increased concern about the possible long-term effects of greenhouse gas emissions calls for greater priority in developing and utilizing electric generation processes that do not produce greenhouse gases.

In its recent Position Paper*, an update of an earlier NPOC Position Paper**, NPOC substantiates these reasons for urgency as well as the important benefits and outstanding record of today's 112 U.S. nuclear plants. The paper also

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* A Perfect Match: Nuclear Energy and the National Energy Strategy, November 1990, published by U.S. Council for Energy Awareness, 1776 I Street NW, Suite 400, Washington, DC 20006

** Nuclear Energy for the Future--What we Must Do, January 1989.

summarizes the industry's major effort to improve the operations of present plants, and identifies the programs underway to design even safer, more reliable, and more economic standardized nuclear plants for the future. The extensive operating experience with today's light water reactors (LWRs), and the promise shown in recent technical developments, leads the industry to the conclusion that the next nuclear plants ordered in the United States will be advanced light water reactors (ALWRs). Two types are under development: units of large output (1300 MWe) called "evolutionary" ALWRs and units of mid-size output (600 MWe) called "passive" ALWRs. (The term "passive" describes the emergency cooling features, which depend more on natural processes such as gravity than on powered equipment such as pumps.) Both approaches rely on proven technology. In addition to the technical design issues, federal and state regulatory uncertainties must be reduced so that the financial risks of nuclear plant construction and operation are reasonable.

Significant progress toward resolving the issues identified in this plan is needed before firm commitments to order more nuclear plants can be expected. It takes many years to license and build the nuclear power plants that will contribute to the needed electric generation capacity in the future. That is why it is important to start planning now.

This Strategic Plan, then, outlines an integrated effort to address the range of institutional and technical issues on which significant progress must be achieved to make nuclear power attractive for the 1990s.

THE CONTENT OF THE PLAN

The plan:

- identifies all the significant enabling conditions (technical/industrial, regulatory, environmental, financial, legislative/legal, organizational, political, and public acceptance) which must be met to achieve the goal;

- assigns lead and supporting responsibilities to the appropriate existing organizations or standing committees in the industry to detail and implement an action plan for achieving each condition;

- fosters joint and coordinated efforts between government and industry which would enhance implementation of the strategies and provide for sharing resource requirements.

Fourteen enabling conditions, or "building blocks," have been defined, each of which uniquely contributes to the complete structure. The "building blocks" are outlined in Figure I-1, which shows the title and lead industry responsibilities, and are grouped into four categories:

Figure I-1: BUILDING BLOCK SUMMARY

A. Prerequisites From Ongoing Programs

There is a need to increase confidence in nuclear power through improved performance. That need is being addressed in ongoing programs, but progress in those programs must be monitored and coordinated since they influence the prospects for success of the overall plan. Four of the building blocks comprise these prerequisite conditions and have the following individual goals:

- Maintain and improve the high safety and reliability performance of operating plants.
- Achieve progress with the high-level waste (spent fuel) disposal system that includes a permanent repository and a temporary monitored retrievable storage facility.
- Assure availability of low-level nuclear plant waste disposal capacity.
- Assure a continuing stable and economic supply of nuclear fuel.

B. Generic Safety/Environmental Regulation and Industry Standards

Construction of new nuclear plants requires a stable and predictable safety and environmental regulatory process. The primary need is for a combined construction and operating license. Companies must be able to obtain a license to operate the plant at the same time they obtain a license to construct it. The Nuclear Regulatory Commission (NRC) issued a new rule on this subject in 1989, titled "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Reactors" (10 CFR 52). In implementing the new rule, the design certifications and combined licenses must be based on standardized regulatory requirements that would not vary or be changed throughout the life of the design certification or the life of the plant, unless stringent backfit criteria were applicable. They must also include Inspections, Tests, Analyses, and Acceptance Criteria, including a "sign as you go" process, which will assure the regulator and the owner that the plant is built in accordance with the licensing requirements established during the combined license review and hearings. Another key task is reconciling regulatory definitions and jurisdiction among the NRC, the Environmental Protection Agency (EPA), and state safety and environmental regulatory agencies. The two goals of this building block are:

- Assure that regulatory processes are in place for predictable licensing, including site approval and design certification, for construction, startup and commencement of full-power operation of new plants.

- Assure that a high-quality, stable regulatory process is in place to assure safety and environmental protection, and to encourage industry self-improvement initiatives, public confidence, and reasonable cost of electricity.

To assure higher confidence in both safety and economic performance, future plants must be designed to incorporate lessons learned over the past 30 years of commercial nuclear power operation. The next generation of plants must also use features that have been proven adequate for safe, reliable, and economic service with respect to operations and maintenance. This should obviate the need for prototype testing prior to commercial usage. The building block to address these needs is based on the concept of user-defined design requirements and has the following goals:

- Complete ALWR Utility Requirements Document and obtain NRC approval.

- Assure that ALWR designs meet the intent of the ALWR Utility Requirements Document.

C. Project-Specific Activities

The building blocks in this group are the technical activities of design, development and testing, site qualification, regulatory review, and project cost and schedule estimates. These provide the construction and operational specifications for the plant. The first major design and testing activity is that required to obtain design certification from the NRC. The second design step, called first-of-a-kind engineering, is the additional design and confirmatory testing necessary to produce the construction drawings, equipment specifications, construction and operational procedures, and final cost and schedule estimates to permit start of construction. Selection, qualification, and licensing of suitable plant sites must proceed in parallel with these design activities and the results factored into the first-of-a-kind engineering processes.

The industry's fundamental objective in these design processes is to achieve standardization--a family (or families) of plants that are essentially the same. The French and Canadian experience in nuclear power has clearly shown that major economies can be achieved through standardization. It eliminates duplication of detailed design and licensing from plant to plant, and provides for a "learning curve" in construction and operation from plant to plant. The definition and implementation of design standardization is a key milestone in the "Predictable Licensing" and "First-of-a-Kind Engineering" building blocks and impacts many other building blocks. In addition, the plan provides for enhanced standardization beyond design to extend the full benefits of standardization to the construction and operating phases, and to

assure that individual plants are not customized through uncoordinated changes by plant owners after operation commences.

The goals of the four building blocks in this category are:

- Obtain NRC certification of ALWR designs.
- Obtain NRC approval of suitable site(s) for new nuclear plants, either through early site permitting or through submission of an application for a combined construction and operating license and NRC approval to build and operate the plant to a certified design under its standardization rule.
- Complete engineering on certified designs in sufficient detail to define firm cost estimates and prepare for construction of ALWR plants.
- Ensure that an institutional infrastructure is in place to provide resources and manage completion of detailed design.
- Define the process to achieve standardization in first-of-a-kind engineering.
- Develop enhanced standardization concepts and cooperative arrangements as a means to increase the predictability of construction cost and schedules, and to improve operational reliability and cost.

D. Institutional Steps

The final four building blocks move from the relatively "narrow" world of the nuclear power industry and its safety and environmental regulators to the "wide" world of financing, rate regulation, public acceptance, and governmental support.

Many lessons have been learned in the "narrow" world which, along with significant innovations, are being incorporated into the first ten building blocks. This Strategic Plan, however, also recognizes the lack of sufficient confidence and support in this "wide" world. The plan addresses this issue in the final four building blocks, which have the following goals:

- Achieve broad U.S. public acceptance of nuclear power, and local public attitudes, at potential plant sites, which are conducive to plant construction and operation.
- Develop a structure for financing, ownership, and operation of nuclear plants which reasonably compensates investors/lenders for associated risks.

- Achieve support by state regulatory agencies for predictable and stable handling of permitting and financial matters.

- Enhance governmental support for the necessary institutional framework, including laws, regulations, and programs, that encourage the construction and operation of new nuclear plants.

A strong element of the plan, which is key to the success of these last four building blocks, is to communicate the results of the previous building blocks broadly outside the industry. This will provide visibility to this "wide" world audience of the benefits of the country's investment in nuclear power; and of the major improvements in current plant operations and in future nuclear power plant designs, particularly their safety features and the effectiveness of their safety and environmental regulation. It will also provide the foundation, through standardization, detailed design and planning, and stable nuclear regulation, on which the confidence of the rate regulators and financial analysts can be built.

IMPLEMENTATION OF THE PLAN

The plan is divided into building blocks that are integrated into an overall plan. Each block has a separate organization as the lead responsible for achieving one or more subordinate goals. Each block also has a series of milestones that will assist in monitoring and managing the project. Blocks are linked together by "tie-ins" to ensure coordination between the diverse organizations and the subordinate projects. This ensures that the schedule is monitored, maintained and that the final goal, a standardized nuclear power plant on-line by the turn of the century, is achieved.

Action plans have been developed for each building block. Each lead organization is responsible for implementing its phase of the plan utilizing its own resources, augmented as required, to achieve the block's goal(s). Each block has a series of supporting organizations assigned to provide input and assistance to the lead organization as required. Significant portions of the plan are well underway. These ongoing efforts include technical and safety regulation activities on present and future plants, and public/political acceptance programs more focused on the present issues in the industry.

The plan also recognizes that success in achieving the goals depends on government actions as well as industry. Where government rather than industry has the basic responsibility and authority over a building block, "primary" or "regulatory" responsibility is given to a government agency, not as an assignment, but to recognize that authority. The "industry lead" organization is assigned responsibility for providing input to the processes in that building block. "Primary" responsibility is also assigned to industry organizations where the eventual implementation requires that one or more industry organizations become

involved through a major commitment of funds. In such cases, the "lead industry" organization will handle the building block in the interim.

NPOC established an Ad Hoc Committee early in 1990 to develop this plan. That task has now been accomplished. The Ad Hoc Committee will now coordinate the work of the lead industry organizations on behalf of NPOC. This coordination, and periodic assessments of progress against the plan, will allow adjustments to the plan. The explicit portrayal of "tie-ins" encourages "self-coordination" to minimize overall project management requirements in this formative time frame.

The Ad Hoc Committee is specifically charged to:

- facilitate the coordination of the action plans among those having the lead responsibilities in order to achieve consistency, mutual support, and compatibility among the action plans in a total team effort;

- facilitate the implementation and effectiveness of the Strategic Plan by monitoring and reporting progress on the various action plans and recommending to NPOC changes to the Strategic Plan where appropriate; and

- identify, recommend, and foster the needed government-industry shared efforts.

Of course, project management will eventually be needed to carry out the detailed activities as the plan matures. Much of this will have to be provided by the organization(s) that see the need to order new plants. Past experience shows that an outstanding project management team is essential to assure that schedules and budgets are met and to instill confidence in those providing and approving the financial arrangements. The timing for formation of any such organization will presumably coincide with accomplishment of the second goal of the Ad Hoc Committee, complementary to the first goal to develop the plan itself:

- to secure firm commitments from sponsoring organizations to devote the necessary resources to build and start operating one or more standardized ALWR nuclear plants.

SECTION II

OUTLINE OF STRATEGIC PLAN

STRATEGIC PLAN FOR BUILDING NEW NUCLEAR POWER PLANTS

SECTION II: OUTLINE OF STRATEGIC PLAN

STRUCTURE OF THE PLAN

The enabling conditions to meet the primary goal of the Strategic Plan are defined. Each enabling condition is framed as a "building block" which uniquely contributes to the complete structure. All the building blocks and their interdependencies are identified and factored into a strategy leading up to putting the last block in place for a firm commitment to build ALWR plants by the mid-90s. Placing the last block in place would include the formalization of resource commitments.

The enabling conditions or "building blocks" are outlined in Figure II-1, which shows the title and lead industry responsibilities. The building blocks are grouped into four categories: (1) Prerequisites From On-Going Programs, (2) Generic Safety/Environmental Regulations and Industry Standards, (3) Project Specific Activities, and (4) Institutional Steps. Each building block is a summary statement of a more detailed action plan which has been developed by the industry organization/standing committee assigned lead responsibility for that block. Each block is formulated in five parts:

1. Title
2. Goal(s) (i.e., the enabling conditions)
3. Responsibility assignments to existing industry organizations for each building block
4. Major milestones
5. Major tie-ins

"Lead industry responsibility" means that the organization so assigned will develop and implement its action plan, utilizing its own resources and seeking assistance and advice as appropriate. Assignments of industry supporting responsibilities are made to designated organizations whose assistance and advice would be most appropriate. The term "utility" is used in each case where the responsibility is assigned to the organization(s) licensed and ultimately responsible for owning and operating a nuclear plant. Tne terms "utility," "licensee," "owner/operator" are interchangeable.

The plan also recognizes that success in achieving the goals depends on government actions as well as industry. Where government rather than industry has the basic responsibility and authority over a building block, "primary" or

Figure II-1: BUILDING BLOCK SUMMARY

PREREQUISITES FROM ONGOING PROGRAMS

(1) Current Nuclear Plant Performance (Licensees)	(12) Low-Level Radioactive Waste (EEI-ACORD)
(11) High-Level Radioactive Waste (EEI-ACORD)	(13) Adequate, Economic Fuel Supply (EEI)

GENERIC SAFETY/ENVIRONMENTAL REGULATION & INDUSTRY STANDARDS

(2) Predictable Licensing & Stable Regulation (NUMARC)	(3) ALWR Utility Requirements (EPRI-USC)

PROJECT-SPECIFIC ACTIVITIES

(4) NRC Design Certification (Plant Designers)	(5) Siting (EPRI-USC/NUMARC)
(6) First-of-a-Kind Engineering (EPRI-USC)	(7) Enhanced Standardization Beyond Design (NUMARC)

INSTITUTIONAL STEPS

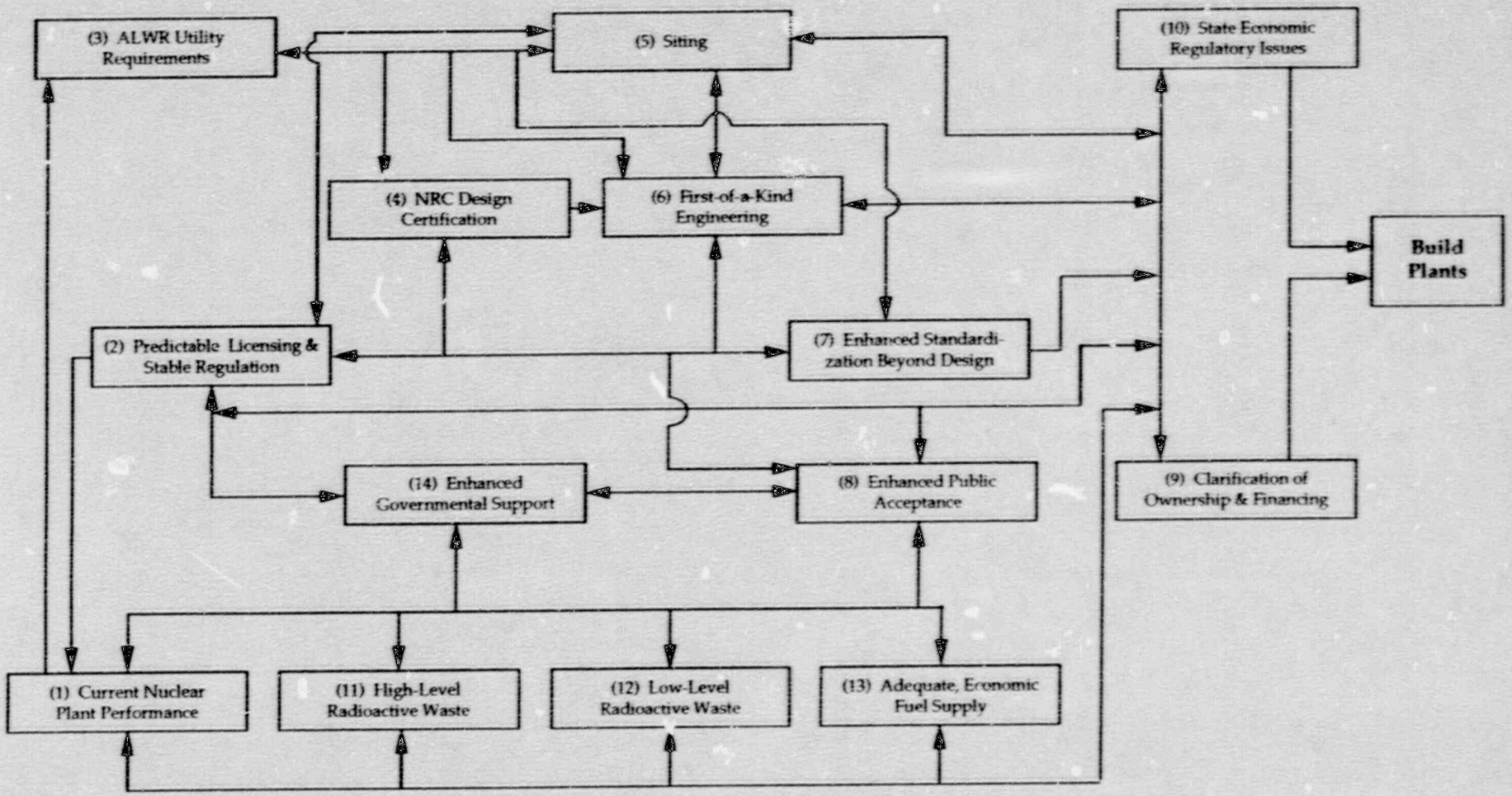
(8) Enhanced Public Acceptance (USCEA)	(9) Clarification of Ownership & Financing (EEI)
(10) State Economic Regulatory Issues (EEI)	(14) Enhanced Governmental Support (ANEC)

"regulatory" responsibility is given to a government agency, not as an assignment but to recognize that authority. The "industry lead" organization is assigned responsibility for providing input to the processes in that building block. "Primary" responsibility is also assigned to industry organizations where the eventual implementation requires that one or more industry organizations become involved through a major commitment of funds. In such cases, the "lead industry" organization will handle the building block in the interim.

Since this is an institutional as well as a technical plan, the milestones are not all as definitive or as measurable as are normal project engineering milestones. They represent a best effort to schedule steps of progress against the goals and will be used to assess that progress as a milestone date is reached.

The tie-ins define the key coordination steps among building blocks. Figure II-2 is a simplified schematic of the major tie-ins so as to portray the concept. Once the plan is defined, coordination among the lead industry organizations will be the primary activity of the Ad Hoc Committee on behalf of NPOC and will provide the insight from which adjustments to the plan are made. This explicit portrayal of coordination points is an effort in accordance with NPOC directions, to minimize overall project management requirements in this formative time frame.

Figure II-2: SCHEMATIC OF MAJOR BUILDING BLOCK "TIE-INS"



THE BUILDING BLOCKS

Block 1: Current Nuclear Plant Performance

Goal:

Maintain and improve the high safety and reliability performance of operating plants.

Responsibilities:

Industry Lead	Utilities
Primary	Utilities
Industry Supporting	EEI/NUMARC/EPRI/Plant Designers
Regulatory	NRC

Milestones:

1. Through INPO* evaluation program, conduct periodic evaluations of nuclear plant performance; provide assessments to utility management.
2. Through INPO SEE-IN Program, analyze events worldwide to identify precursor events. Analyze and disseminate operating data and follow up on effectiveness of corrective actions.
3. Support activities of National Academy for Nuclear Training and support continuing accreditation of training programs.
4. Report on progress as measured by industry performance indicators against the 1990 long-term goals.
5. Establish U.S. industry 1995 goals for a uniform set of performance indicators agreed upon for worldwide use by WANO.
6. Monitor and provide annual progress reports against the 1995 goals.
7. Annual review of average O&M cost data by EPRI.

Tie-Ins:

- From Blocks 2 and 10--Stable regulatory environment that encourages industry self-improvement initiatives.
- To Block 3--Provide industry operating experience and long-term goals input to ALWR Utility Requirements Document.
- To Blocks 8 and 14--Provide industry performance indicator results for public dissemination.

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* INPO was formed by the industry to promote the safety and reliability of nuclear operating plants. INPO continues its assigned role as an ongoing part of this block.

Block 2: Predictable Licensing and Stable Regulation

Goals:

1. Assure that regulatory processes are in place for predictable licensing, including site approval and design certification, for construction, startup and commencement of full-power operation of new plants.
2. Assure that a high-quality, stable regulatory process is in place to assure safety and environmental protection; and encourage industry self-improvement initiatives, public confidence, and reasonable cost of electricity.

Responsibilities:

Industry Lead	NUMARC
Primary	NRC
Industry Supporting	ANEC/EPRI-ALWR Utility Steering Committee (USC)/USCEA/Plant Designers/Utilities
Regulatory	NRC
Others	DOE/EPA/FERC/FEMA/State Regulatory Agencies

Milestones:

1. Obtain NRC agreement, via Commission policy, on level of design detail required for design certification.
2. Obtain NRC acceptance of NUMARC report on ITAAC.
3. Work with EPRI and the ALWR USC to support NRC review of the Utility Requirements Document to achieve milestones in Block 3.
4. Work with plant designers and NRC to establish an effective design certification process and schedule to achieve milestones in Block 4.
5. Finalize programs associated with early site approval regulations.
6. Review environmental siting regulations and procedures.
7. Assess amendments to environmental siting regulations.
8. Develop strategies and methodologies to implement a COL.
9. Develop working practices, procedures, and methodologies associated with the "sign-as-you-go" process; obtain NRC concurrence.
10. Minimize impact due to overlap of regulatory responsibilities among NRC, EPA, FEMA, and state safety and environmental regulators.
11. Resolve issues identified in NUREG-1395 and Generic Letter 90-01.

Tie-Ins:

- To Blocks 1 and 7--Stable regulatory environment that encourages industry self-improvement initiatives.
- To Block 4--Define and obtain NRC concurrence to an implementation schedule that permits completion of evolutionary plant certifications by 1992 and passive plant certifications by 1995.
- To Blocks 4 and 6--Closure on level of detail required for certification.
- To Block 8--Communications support for legislative actions.
- From/to Block 14--Legislation to support predictable licensing.

Block 3: ALWR Utility Requirements

Goals:

1. Complete ALWR Utility Requirements Document and obtain NRC approval.
2. Assure that ALWR designs meet the intent of the ALWR Utility Requirements Document.

Responsibilities:

Industry Lead	EPRI-USC
Primary	EPRI-USC/Plant Designers
Industry Supporting	NUMARC
Government Supporting	DOE
Regulatory	NRC

Milestones:

1.	3/91	NRC final SER on evolutionary ALWR Utility Requirements Document.
2.	9/91	Formal endorsement by utility CEOs of ALWR Utility Requirements Document.
3.	2/92	NRC final SER on passive ALWR Utility Requirements Document.
4.	6/92	Assess passive ALWR certification design conformance to the Utility Requirements Document.
5.	12/95	Assess passive ALWR first-of-a-kind engineering design for conformance to the Utility Requirements Document.

Tie-Ins:

- From Block 1--Input of operating experience from current plants to development of ALWR requirements.
- To Blocks 4, 5, 6 and 7--Evolutionary and passive ALWR Utility Requirements Document submittals to NRC and plant designers as basis for initial design certification submittals to NRC, enveloping siting parameters, first-of-a-kind (FOAK) engineering development, and design basis for standardization beyond design.
- To Block 4--Assess certification design for conformance to passive ALWR Utility Requirements Document.
- To Block 6--Check of FOAK engineering design conformance to passive ALWR Utility Requirements Document.

Block 4: NRC Design Certification

Goal:

Obtain NRC certification of ALWR designs.

Responsibilities:

Industry Lead	Plant Designers
Primary	NRC
Industry Supporting	EPRI-USC/NUMARC/ANEC/USCEA
Government Supporting	DOE
Regulatory	NRC

Milestones:

1.	6/92	Evolutionary ABWR design certification obtained.
2.	12/92	Evolutionary System 80+ design certification obtained.
3.	6/92	Passive AP 600 standard SAR submitted to NRC.
4.	8/92	Passive SBWR standard SAR submitted to NRC.
5.	12/94	AP 600 design certification obtained.
6.	2/95	SBWR design certification obtained.

Tie-Ins:

- From Block 2--NUMARC input to plant designers on resolution with NRC of ITAAC requirements, level of detail required for design certification, and other 10 CFR Part 52 implementation issues.
- From Block 3--ALWR utility requirements for the design with integrated consensus utility requirements for all future ALWR designs and design resolutions of open regulatory issues.
- From/to Block 5--Site parameters for standard design established by NRC-approved ALWR Utility Requirements Document and implemented in design certification.
- To Block 6--Design certification is starting point for first-of-a-kind engineering and will influence the approach taken to standardization beyond design certification.
- To Block 7--Design input to approaches taken in standardization beyond design.
- To Block 8--Individual design descriptions to assist in public communications.
- From Block 13--Designs must consider relationship between fuel design and fuel availability.

Block 5: Siting

Goal:

Obtain NRC approval of suitable site(s) for new nuclear plants either through early site permitting or through submission of an application for a combined construction and operating license and NRC approval to build and operate the plant to a certified design under its standardization rule.

Responsibilities:

Industry Lead	EPRI-USC/NUMARC
Primary	Utilities
Industry Supporting	ANEC/EEI/USCEA
Government Supporting	DOE
Regulatory	NRC

Milestones:

1. Formation of industry siting group.
2. Response to DOE RFQ is made.
3. Evaluation phase initiated as part of DOE-sponsored early site permit program.
4. Establish timing for initiation of formal approval process.
5. Completion of evaluation phase.
6. Selection of candidate sites for evaluation, including presently approved sites; initiation of selection phase.
7. Submission of application for site approval.
8. Initiation of site characterization, or review and updating of characteristics of presently approved site(s).
9. Receipt of site approval from NRC.

Tie-Ins:

- To Block 2--To provide specific experience in implementing NRC's standardization rule (10 CFR 52).
- From Blocks 3, 4, and 6--To assure that the specific site characteristics fall within the enveloping site design parameters of the ALWR Utility Requirements Document and standard designs being certified.
- To Blocks 8 and 10--To determine timing of actions and coordinate with local communications programs; to address state and local regulatory and economic issues.

Block 6: First-of-a-Kind Engineering

Goals:

1. Complete engineering on certified designs in sufficient detail to define firm cost estimates and prepare for construction of ALWR plants.
2. Ensure that an institutional infrastructure is in place to provide resources and manage completion of detailed design.
3. Define the process to achieve standardization in first-of-a-kind-engineering.

Responsibilities:

Industry Lead	EPRI-USC
Primary	Plant Designers/AEs/DOE/Potential Owner/Operator(s)
Industry Supporting	NUMARC
Others	DOE/NRC

Milestones:

1. Develop funding plan.
2. Identification of customer(s).
3. Initiate FOAK engineering.
4. Completion of FOAK engineering.

Tie-Ins:

- From Block 2--Level of design detail required for design certification.
- From Block 3--Design basis for plant designer, vehicle for NRC approval.
- From Block 4--Description of certified design.
- From Block 5--Site identification and site parameters.
- To/from Block 7--Provide the design basis for enhanced standardization beyond design and input for O&M cost predictability.
- To Block 9--Provide cost estimates for lead customer financing needs.
- To Block 10--Increased certainty of construction schedules and budgets.
- To/from Block 13--Integration of fuel and plant.

Block 7: Enhanced Standardization Beyond Design

Goal:

Develop enhanced standardization concepts and cooperative arrangements as a means to increase the predictability of construction cost and schedules, and to improve operational reliability and cost.

Responsibilities:

Industry Lead	NUMARC
Primary	Plant Designers/AEs/Utilities
Industry Supporting	INPO/EPRI-USC/EEI
Others	DOE/NRC

Milestones:

1. Review NUMARC Standardization Oversight Working Group's (SOWG) charter in regard to standardization.
2. Define standardization beyond design pertaining to construction, startup, operation and maintenance, and change practices.
3. Assess the experience with standardization issues in current plants.
4. Assess the impact and benefits accrued from the implementation of standardization practices in other countries.
5. Assess the standardization definitions in terms of cost, predictability, and qualification of equipment suppliers.

Tie-Ins:

- From Block 1--Provide input from current plant O&M cost analysis.
- From Blocks 2, 3, and 4--Technical basis and input into the processes, general working practices and philosophies of standardized activities beyond design.
- To Blocks 2, 3 and 4--To provide input to the ITAAC process.
- From/to Blocks 9 and 10--Enhance the assessment of financial issues.

Block 8: Enhanced Public Acceptance

Goals:

1. Achieve broad U.S. public acceptance of nuclear power.
2. Achieve local public attitudes, at potential plant sites, which are conducive to plant construction and operation.

Responsibilities:

Industry Lead	USCEA
Primary	U.S. Nuclear Industry/DOE/NRC/ Congress/USCEA
Industry Supporting	ANEC/EEI/APPA/NRECA/NUMARC
Regulatory	NRC/State Regulatory Agencies

Milestones:

1. Continue national communications on the benefits of and need for additional nuclear energy plants.
2. Complete communications efforts encouraging a high priority for nuclear energy in DOE's National Energy Strategy (NES).
3. Provide communications support for the industry's legislative and regulatory goals, including licensing reform, standardization, privatization of DOE enrichment facilities, etc.
4. Help achieve significant progress toward establishing a high-level waste repository.
5. Assist applicants for early site permits or combined licenses with local communications programs, when potential sites for new nuclear plants are identified.
6. Achieve heightened awareness of the need for financial risk/reward balancing by state utility regulators.
7. Inform the financial community of the need for, and financial viability of, additional nuclear energy plants.
8. Provide the technical basis for communication, legislative efforts, and policy development in areas not covered by other industry organizations.
9. Monitor public acceptance of nuclear energy.
10. Enhance communications programs on the features of future advanced nuclear energy plants.
11. Provide information to the media on radiation issues.
12. Communication of performance status of U.S. operating plants.

Tie-Ins:

- Information input to this block is required from all other blocks.
- To Blocks 2, 5, 9, 10, 11, 12, 13 and 14--To encourage actions favorable to the nuclear option.

Block 9: Clarification of Ownership and Financing

Goal:

Develop a structure for financing, ownership, and operation of nuclear plants which reasonably compensates investors/lenders for associated risks.

Responsibilities:

Industry Lead	EEI
Primary	FERC/SEC/Congress
Industry Supporting	ANEC/USCEA/Plant Designers
Regulatory	FERC/SEC

Milestones:

1. Identify and summarize alternative forms of power plant ownership.
2. Obtain financial model.
3. Evaluate impact of current and potential ownership forms on site selection, financing/construction alternatives, cost and schedule.
4. Identify and attempt to quantify nuclear insurance-related risks and potential liabilities.
5. Review and identify perceived legislative legal and regulatory constraints to implementation of the various forms of ownership.
6. Identify and evaluate options to formulate contracts for sale of electricity.
7. Prepare written report.

Tie-Ins:

- To Blocks 2, 10, and 14--Identify legislative, legal, and regulatory constraints.
- From/to Block 5--Evaluate impact of ownership forms on siting.
- To Block 6--Evaluate level of confidence achieved in costs and schedules from the completion of FOAK engineering on risk allocation and its impact on current and potential ownership forms.
- To Blocks 11 and 12--Identify and quantify nuclear insurance-related risks and potential liabilities.
- To Block 13--Obtain financial model; evaluate impact of fuel prices.

Block 10: State Economic Regulatory Issues

Goal:

Achieve support by state regulatory agencies for predictable and stable handling of permitting and financial matters.

Responsibilities:

Industry Lead	EEI
Primary	NARUC
Industry Supporting	USCEA/ANEC/NUMARC/APPA/ NRECA
Government Supporting	Regional states groups (e.g, Southern States Energy Board)
Regulatory	Individual State Regulatory Agencies

Milestones:

1. Protocols regarding rolling prudence.
2. Pre approval contracting.
3. Protocols regarding integrated resource planning.
4. Periodic reports to NPOC.

Tie-Ins:

- To Block 2--Coordination with stable and predictable safety regulatory approach.
- To Block 6--Engineering cost estimates to support competitive analysis.
- To Block 7--To enhance the assessment of financial risk.
- To Block 8--To recognize the full benefits of nuclear energy.
- To Block 9--To open up ownership and financing opportunities.
- To Block 11--To increase investor/PUC confidence.
- To Block 14--Coordination with legislative activities and governmental support.

Block 11: High-Level Radioactive Waste

Goal:

Achieve progress with the high-level waste (spent fuel) disposal system that includes a permanent repository and a temporary monitored retrievable storage (MRS) facility.

Responsibilities:

Industry Lead	EEI-ACORD
Primary	DOE
Industry Supporting	UWASTE/USCEA/NUMARC/EPRI/ ANEC
Regulatory	NRC/EPA/DOT/DOE

Milestones:

1. Ensure continuing viability of nuclear energy plant on-site storage.
2. Reorganization of DOE Office of Civilian Radioactive Waste Management.
3. Management and operations (M&O) contractor established.
4. Complete the characterization of the Yucca Mountain site.
5. Provide an MRS facility.
6. If Yucca Mountain is found suitable for development as the nation's first high-level nuclear waste repository, begin licensing process.
7. Start construction of repository at Yucca Mountain.
8. Begin acceptance of spent fuel at repository.

Tie-Ins:

- To Block 1--Expanded on-site fuel storage at current plants.
- To Blocks 8 and 14--Enhance nation's confidence that it can rely on nuclear energy, by achieving progress on high-level radioactive waste management.
- To Blocks 9 and 10--To increase investor and state PUC confidence, by achieving progress on high-level radioactive waste management.

Block 12: Low-Level Radioactive Waste

Goal:
Assure availability of low-level nuclear plant waste disposal capacity.

Responsibilities:

Industry Lead	EEI-ACORD
Primary	States
Industry Supporting	UWASTE/USCEA/ANEC/NUMARC/ EPRI
Regulatory	NRC/EPA

Milestones:
Opening of new state and compact low-level disposal sites.

Tie-Ins:

- To Block 1--To promote minimization of low-level waste volumes and occupational radiation exposures.
- To Blocks 8 and 14--Enhance the nation's and government's confidence that it can rely on nuclear energy, by achieving progress on low-level radioactive waste management.

Block 13: Adequate, Economic Fuel Supply

Goal:

Assure a continuing stable and economic supply of nuclear fuel.

Responsibilities:

Industry Lead	EEI
Primary	DOE/Private Sector Uranium and Uranium Enrichment Suppliers/ Converters/Utilities
Industry Supporting	ANEC/USCEA
Regulatory	NRC

Milestones:

1. Continue dependable, economical, and reliable nuclear fuel supply.
2. Seek passage of equitable legislation to make the U.S. DOE Uranium Enrichment Enterprise a separate corporation.
3. Improve the availability of domestic enrichment services at competitive prices by encouraging private enrichment.

Tie-Ins:

- To Blocks 9 and 14--Assess adequacy of economic nuclear fuel.
- From Blocks 8, 10, and 14--To gain support for predictable fuel supply.

Block 14: Enhanced Governmental Support

Goal:

Enhance governmental support for the necessary institutional framework, including laws, regulations and programs, that encourage the construction and operation of new nuclear plants.

Responsibilities:

Industry Lead	ANEC
Primary	Congress/States/DOE
Industry Supporting	EEI/APPA/USCEA/NUMARC/U.S. Industry

Milestones:

1. Provide periodic progress reports on utility performance to Congress.
2. Recognition of nuclear energy's role included in the National Energy Strategy.
3. DOE and NRC budget and appropriations.
4. Advanced reactors R&D legislation.
5. Congressional enactment of legislation to codify and strengthen NRC's combined licensing process.
6. Clarify regulatory responsibilities among NRC, EPA, and states.
7. Obtain state legislation to assure adequate economic return for nuclear projects.
8. Passage of Uranium Enrichment Enterprise (UEE) restructuring legislation.
9. Obtain necessary legislation to assure continued progress on high-level radioactive waste facilities; achieve enhanced acceptance in Nevada.
10. Low-level waste issues.

Tie-Ins:

- To Block 2--Achieve legislative reinforcement of predictable licensing.
- To Block 4--Encourage adequate appropriations legislation for certification activities.
- To Block 5--Assure continuing support of the siting program by DOE and Congress.
- From Block 8--Assist and support efforts to enhance public acceptance
- To Block 10--Enhance confidence in the financial prudence review through state rate reform legislation.
- To Block 11--Achieve enhanced acceptance of the HLW program in Nevada.
- To Block 12--Monitor and coordinate Congressional activities for equitable resolution of LLW issues.
- To Block 13--Secure passage of UEE restructuring legislation.

THE ACTION PLANS

The action plans have been formulated by the industry organization assigned "industry lead" responsibility. The action plan milestones and schedules are keyed to the major milestones, schedules and interrelationships ("tie-ins") identified in the overall Strategic Plan. Implementation of the action plans is the responsibility of the lead organizations with appropriate support from the organizations assigned industry supporting responsibilities. In many building blocks, the resource commitments to complete the block have not been made. In these cases, the lead organization will foster, not necessarily make, those commitments. If resource commitments to implement a block are later made to an organization other than the lead organization, lead responsibility will be turned over to that organization.

SECTION III

SUPPORTING ACTION PLANS

ACTION PLAN FOR BUILDING BLOCK #1: CURRENT NUCLEAR PLANT PERFORMANCE

I. Goals and Responsibilities

Goal:

Maintain and improve the high safety and reliability performance of operating plants.

Responsibilities:

Industry Lead	Utilities
Primary	Utilities
Industry Supporting	EEI/NUMARC/EPRI/Plant Designers
Regulatory	NRC

II. Summary Action Plan

Utilities that hold the license to operate nuclear power plants have the primary responsibility for the safe and reliable operation of their plant(s). Considerable effort has been devoted by utilities to improve their management and operation of nuclear power plants. Recognizing the need to strive for excellence in nuclear plant operations and to accept the need for improvement by peer review, and recognizing the fact that all nuclear utilities are affected by the actions of any one utility, the nuclear industry established the Institute of Nuclear Power Operations (INPO) in 1979. INPO's mission is to promote the highest levels of safety and reliability--to promote excellence--in the operation of nuclear electric generating plants.

The industry also recognizes that a strong and well-managed federal regulator, the Nuclear Regulatory Commission (NRC), is an essential part of the nation's commercial nuclear program. The industry has established the Nuclear Management and Resources Council (NUMARC) to serve as the nuclear power industry's principal mechanism for conveying industry views, concerns, and policies regarding industrywide regulatory issues to the NRC and other government agencies as appropriate.

The Electric Power Research Institute (EPRI) provides leadership and innovation in science and technology to assist the utility industry in furnishing the highest value energy services to its customers. EPRI conducts research and development aimed at providing information, techniques, diagnostic tools, and equipment that will help member utilities optimize operating and maintenance costs, improve their productivity, and extend the life of their existing nuclear generating facilities.

In the years since the TMI accident, the commercial U.S. nuclear utility industry has implemented and progressed well beyond the recommendations in the Kemeny Commission Report in improving operations at its nuclear power plants. Much of this has been accomplished via INPO's cornerstone programs: plant and corporate evaluations, training and accreditation, events analysis and information exchange, and assistance efforts.

- The industry established its own means of evaluating performance at U.S. nuclear plants through INPO. Teams of experienced (both INPO permanent staff and industry loaned employees), augmented by experts from similar plants, perform regular evaluations of every U.S. nuclear station to ensure each plant is operated and maintained to industry standards of excellence.

- In early 1980, an industry event analysis program was initiated by EPRI and jointly developed with INPO to meet an industry need of systematically sharing operating experience among plants. The program, Significant Event Evaluation and Information Network (SEE-IN), provides a formal mechanism through which event information is reported, analyzed, and disseminated. Detailed information on international and domestic nuclear plant events is reviewed by a staff of experts at INPO, including loaned employees from nuclear steam system suppliers and architect/engineers. Significant lessons learned from these events are provided to all U.S. plants, and INPO teams follow up during plant evaluation visits to see that these lessons are implemented. An electronic message system called NUCLEAR NETWORK, which rapidly disseminates this information nationwide and to many other countries, is an integral part of this program.

- Early on, nuclear executives recognized the need for improved, uniform training at nuclear utilities nationwide, a need reinforced by the Kemeny Commission. The utilities also realized a need for formal training of all key craftsmen and technical positions, not just for licensed control room operators. In 1982, an accreditation process was established through INPO to address these needs. Since then the utilities have established training programs for 11 key positions and have met their commitments to accreditation. To formalize these extensive initiatives, the National Academy for Nuclear Training was established under the auspices of INPO. The National Academy is comprised of three elements:

  -- the training activities, resources, and facilities of the nuclear utility industry,

  -- the independent National Nuclear Accrediting Board, and

  -- INPO training and accreditation activities.

Each plant site with accredited training programs is a branch of the National Academy. Utilities must have all training programs accredited at each of their operating nuclear plants to become members of the National Academy.

- In 1981, the industry began developing a performance indicator program to provide quantitative evidence of progress in key areas. Not only do the performance indicators allow utilities to gauge their plants' improvements, they also allow the industry as a whole to monitor its progress. In addition, the indicators foster healthy competition among utilities and plants, which inevitably results in better performance. By 1986, each U.S. utility with an operating unit had set 1990 goals for these performance indicators; the individual goals were combined (averaged) to develop overall industry goals. By the end of 1989, improving trends were evident in every area, and the 1990 goals had been achieved for several indicators.

- Extensive backfitting or system or component upgrades have been accomplished at every nuclear station in response to the Nuclear Regulatory Commission's post-TMI action plan and to industry initiatives. The nuclear steam system suppliers, owners groups, architect/engineers, and the Electric Power Research Institute have participated in this extensive and successful effort.

- Through a variety of exchange programs, U.S. utilities are sharing operating experiences with utilities in many other countries. This international information exchange fosters enhancements in nuclear plant operations on a worldwide basis and provides a means for incorporating international experience in the U.S. base of knowledge. The World Association of Nuclear Operators (WANO), formally inaugurated in May 1989, now provides a formal basis for exchanging operating experience with every country that operates nuclear plant(s) for the generation of electricity. WANO was formed in response to the Chernobyl accident, just as INPO was formed in response to TMI. Many international executives have noted that their willingness to form and participate in WANO stems directly from observing the successful results achieved by the U.S. nuclear utility industry over the past ten years.

The primary emphasis in this block is on continuing to strive for the highest levels of safety and reliability in the operation of nuclear plants. But this effort also yields increased plant generation, improved productivity, and advanced technology, which result in lower operating and maintenance (O&M) costs per MWe produced. It is essential to increasing public and investor confidence in nuclear power that such activities continue to contribute to more efficient plant operations so as to maintain the economic competitiveness of nuclear power as compared to the available alternatives.

III. Milestones

1M1	Through the INPO evaluation program, conduct periodic evaluations of nuclear plant performance using performance objectives and criteria, and guidelines based on standards of excellence. Provide objective assessments of plant performance to utility management.	Ongoing
1M2	Through the INPO Significant Event Evaluation and Information Network (SEE-IN) Program, analyze events that occur in nuclear plants worldwide to identify precursors of potentially more serious events. Collect and analyze industry data on nuclear plant operations and equipment reliability, including data and event information received from the World Association of Nuclear Operators. Disseminate this information worldwide and follow up on the effectiveness of corrective actions in U.S. plants.	Ongoing
1M3	Support the activities of the National Academy for Nuclear Training and the independent National Nuclear Accrediting Board. Support continuing accreditation of key industry training programs by maintaining and improving high-quality training for personnel involved in operation, maintenance, support, and management. (Initial accreditation of training programs for all plants with fuel loaded prior to December 31, 1984 (600 programs) was achieved by the end of 1988.)	
1M3.1	Have key training programs for plants loading fuel after December 31, 1984 ready for initial accreditation within two years of initial startup.	On schedule & Ongoing
1M3.2	Reevaluate and achieve accreditation renewal for each program every four years.	Ongoing
1M4	Report on progress as measured by industry performance indicators against the 1990 long-term goals.	3/91
1M5	Establish U.S. industry 1995 goals for the uniform set of performance indicators agreed upon for worldwide use by the World Association of Nuclear Operators.	3/91
1M6	Monitor and provide annual progress reports against the 1995 goals.	Annually

1M7 Annual review of average O&M cost data by EPRI. Annually

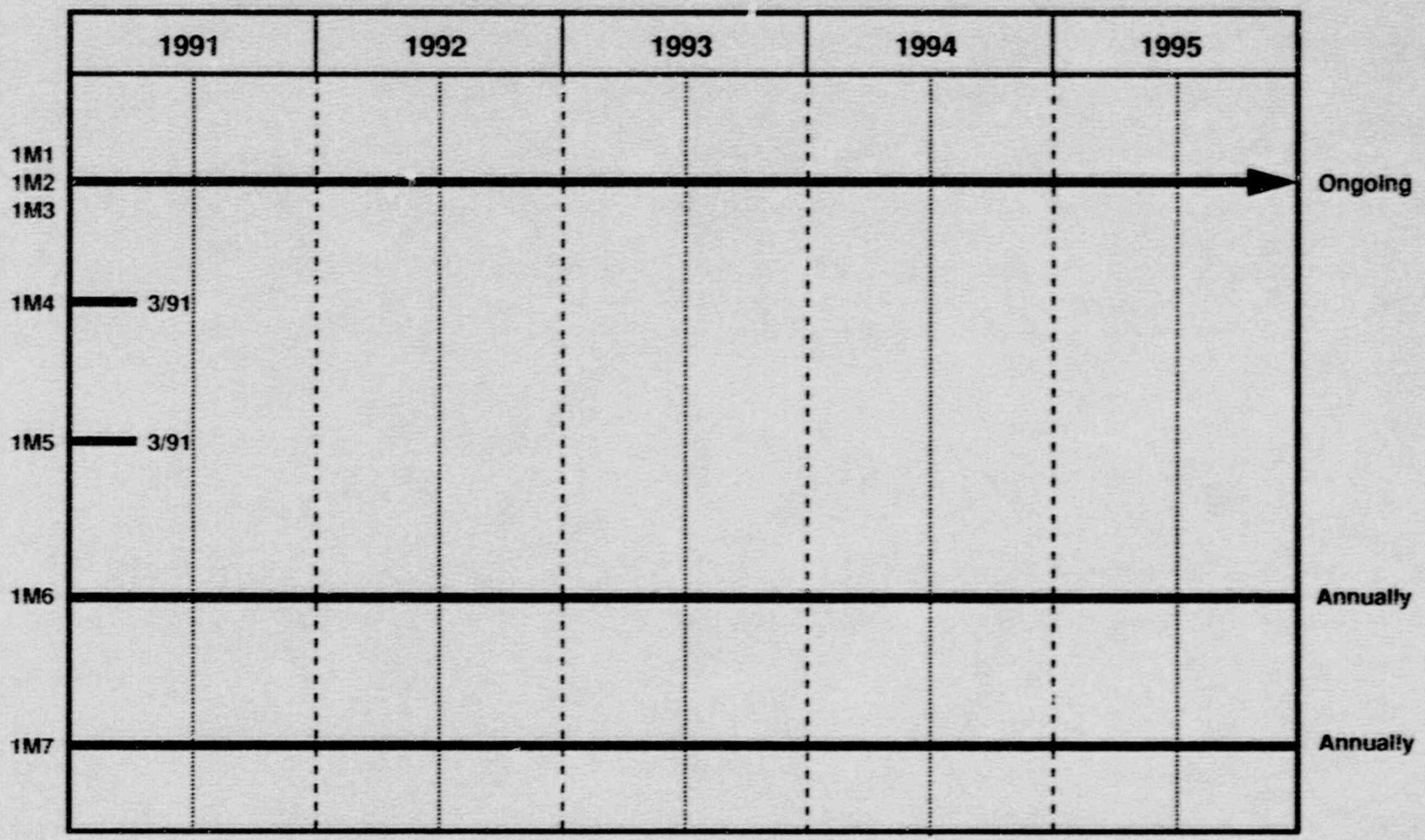
IV. Tie-Ins

1T1 From Blocks 2 and 10--Stable regulatory environment that encourages industry self-improvement initiatives and reinforces utility line management responsibility and authority for safe and reliable plant operation.

1T2 To Block 3--Provide industry operating experience and long-term goals input to ALWR Utility Requirements Document.

1T3 To Blocks 8 and 10--Provide industry performance indicator results for public dissemination.

Schedule Display for Block 1



ACTION PLAN FOR BUILDING BLOCK #2: PREDICTABLE LICENSING AND STABLE REGULATION

I. Goals and Responsibilities

Goals:

1. Assure that regulatory processes are in place for predictable licensing, including site approval and design certification, for construction, startup and commencement of full-power operation of new plants.
2. Assure that a high-quality, stable regulatory process is in place to assure safety and environmental protection, and to encourage industry self-improvement initiatives, public confidence, and reasonable cost of electricity.

Responsibilities:

Industry Lead	NUMARC
Primary	NRC
Industry Supporting	ANEC/EPRI-ALWR Utility Steering Committee (USC)/USCEA/Plant Designers/ Utilities
Regulatory	NRC
Others	DOE/EPA/FERC/FEMA/State Regulatory Agencies

II. Summary Action Plan

The industry actively participated in the development of the 10 CFR Part 52 Rule (titled "Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Reactors"), and has made detailed presentations to the NRC on the industry's proposed approach, developed by the NUMARC Standardization Oversight Working Group (SOWG), for implementation of that rule. The industry proposes a two-tier approach as a means of implementing the rule. The first tier would contain a self-standing description of the design bases and the design features of structures, systems and components based on the scope and organization of Section 1.2 of the Standard Safety Analysis Report (SSAR) for that design. Thus, the critical plant design features affecting the safety systems and consequently the safe operation of the plant would be documented, reviewed and approved in the design certification. The first tier would also contain the corresponding array of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) which are required by Part 52. The second tier would reference the entire SSAR which will be the technical basis for the NRC's final design approval and design certification reviews. The industry's proposal utilizes the current 10 CFR 50.59 process, as indicated in the Part 52 rule, to control the

changes to the second tier. The first tier cannot be changed without first obtaining NRC approval, which includes the opportunity for a public hearing.

The NRC Commissioners have publicly expressed their desire to require extensive design detail in applications and are expected to make a decision in the autumn of 1990 on the recommendations from industry and NRC staff on the level of design detail required for a design certification application, and on the use of established practices such as the 10 CFR 50.59 process during the construction and operation of future standardized plants. The Commission will be basing their decision on the recommendations of the industry and the NRC staff.

The philosophies and implementation of the specific components of 10 CFR Part 52 must be developed. The components include design certification, early site approval, combined licenses, change control procedures and preoperational proceedings. The ITAAC requirements are being identified that will form the basis of preapproved acceptance criteria, which will assure the constructed plants meet the intent and the requirements of the certified design and the COL.

NUMARC, through the SOWG, developed a definition of a standard design, from a licensing perspective, based on the Statement of Considerations associated with Part 52. The definition states:

> "A standard design is a design that is sufficiently detailed and complete to support certification in accordance with Subpart B* of 10 CFR Part 52, and which is usable for a multiple number of units or at a multiple number of sites without reopening or repeating the NRC licensing review."

EPRI will continue to work with the NRC to reach agreement on the ALWR Utility Requirements Documents that list the specific requirements and general specifications for future plant designs. These requirements will be common to all ALWR designs independent of NSSS vendor. The Commission has agreed that the review of the Requirements Document for passive plants will precede the design certification reviews. The Commission and industry rationale is that early, generic resolution of major technical issues during the NRC review of the Requirements Document should lead to a more stable and uniform review process for the design certification applications, and contribute to the standardization of future plants. Furthermore, the Requirements Document provides a standardized format and framework for designing and procuring future plants.

The NUMARC "Report on Inspections, Tests, Analyses and Acceptance Criteria" (NUMARC ITAAC Report), in draft form, has been reviewed with the NRC staff,

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* 10 CFR Part 52, Subpart B only refers to the design certification aspects of the licensing process. The site-specific considerations would be discussed at the COL stage and are covered by 10 CFR Part 52, Subpart C.

and the final document will be submitted to the NRC for approval within the next few months. NRC acceptance of the approach and the philosophies in that report will be pursued with the aim of getting an acknowledgement of, and agreement on, the concepts, philosophies and content of the ITAAC report by the NRC Commissioners and staff before February 1991.

Methodologies, working practices and procedures will be developed to put in place a "Sign As You Go" process, similar to that used in the readiness review of the Vogtle facility, for documenting NRC acceptance of the ITAAC requirements. The objective would be to assure the NRC and the public that a plant is constructed in accordance with the licensing requirements established during the COL review and public hearing. These guidelines will be compatible with the NRC's procedures and working practices.

The NUMARC SOWG will develop a set of guidelines and procedures to enable a company or consortium of companies to make application and obtain approval of a COL for the construction and operation of a certified design. The issues, methodologies, general procedures and actions surrounding the COL phase of the regulatory process associated with the construction of future standardized nuclear plants will be reviewed and discussed with the NRC.

The issues, methodologies, guidelines and actions surrounding the early site permit of the regulatory process associated with the siting of future standardized nuclear plants will be reviewed by the NUMARC SOWG and discussed with the NRC. The SOWG will also address resolution of NEPA and other issues which arise.

The industry will advise NUMARC and the other industry agencies such as ANEC and USCEA on the issues needing resolution which involve discussions with the NRC staff, other regulatory agencies, Congress and the public to create a common interpretation and understanding. The aim of this task is to reduce the impact of overlapping regulatory responsibilities on the industry and achieve a unified regulatory environment by:

i. Continuing to work with the various regulatory agencies to ease the burden on the industry of dual regulation by different federal and state agencies.

ii. Continuing industry endeavors to correct and resolve the major issues described in NUREG-1395, "Industry Perceptions of the Impact of the U.S. Nuclear Regulatory Commission on Nuclear Power Plant Activities," as well as assisting regulatory agencies such as EPA, FEMA, NRC, etc., in identifying areas of overlapping regulatory responsibilities.

(iii) Continuing to work with Congress and the public to develop legislative and public support for nuclear power and the need for predictable licensing and regulatory unity.

NUREG-1395 was prepared in response to the industry concerns over the apparent expansion of the NRC perceived jurisdiction into management and economic aspects of the commercial nuclear industry. The industry associations involved in assisting in the identification and reduction of the impact of dual regulatory action by multiple agencies will also assess the effectiveness of the action plans put in place to resolve the root causes of these issues.

The industry and the regulator must now work in concert to develop and agree on the procedures and working practices to implement Part 52, in a practical and economic manner, while assuring public safety and advancing standardization, within the confines of the other laws of the country. These new regulatory working practices, which will identify and resolve the issues at the start of the process and before any construction begins. Predictability and stability are some of the major factors that will minimize the financial risk associated with construction and operation of future nuclear power plants.

III. Milestones

2M1	Obtain NRC agreement, via Commission policy on the level of design detail required for design certification.		11/90
2M2	Obtain NRC acceptance of NUMARC Report on Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC).		2/91
2M3	Work with EPRI and the ALWR USC to monitor and support the NRC review processes and schedules so as to achieve the Utility Requirements Document NRC approvals in accordance with the milestones in Block 3:		
	3M1	Final SER on evolutionary plant requirements	3/91
	3M3	Final SER on passive plant requirements	2/92
2M4	Work with plant designers and NRC to establish an effective design certification process and schedule so as to achieve the FDAs and design certifications in Block 4:		
	4M-GE1.2	FDA for GE ABWR	3/91
	4M-GE1.3	Design certification for GE ABWR	6/92
	4M-ABB-CE1.9	FDA for System 80+	12/91
	4M-ABB-CE1.14	Design certification for System 80+	12/92
	4M-W5	FDA for AP 600	12/93
	4M-GE3.7	FDA for GE SBWR	2/94

4M-W7.14	Design certification for AP 600	12/94
4M-GE3.8	Design certification for GE SBWR	2/95

2M5 Finalize the programs associated with the early site approval regulations, such as emergency preparedness programs. 7/91

2M6 Review environmental siting regulations and procedures. 7/91

2M7 Assess amendments to environmental siting regulations and impact on previously approved or evaluated sites. 7/91

2M8 Develop strategies and methodologies to implement the functions associated with the submittal and approval of a combined construction and operating license (COL). 10/91

2M9 Develop working practices, procedures and methodologies associated with the "Sign As You Go" process and obtain NRC concurrence of the process. 6/92

2M10 Minimize the impact on the nuclear utility industry due to overlap of regulatory responsibilities among NRC, EPA, FEMA, and state safety and environmental regulators. Ongoing

2M11* Resolve the root causes of issues identified in NUREG-1395, "Industry Perceptions of the Impact of the U.S. NRC on Nuclear Power Plant Activities," the responses to NRC Generic Letter 90-01, "Request for Voluntary Participation in NRC Regulatory Impact Survey," and the issues identified from SECY 90-250, "Survey of NRC Staff Insights on Regulatory Impact." Ongoing

IV. Tie-Ins

2T1 To Block 1--Stable regulatory environment that encourages industry self-improvement initiatives.

2T2 To Block 4--Define and obtain NRC concurrence to an implementation of 10 CFR Part 52 that permits completion of the evolutionary plant certifications by 1992 and passive plants certifications by 1995.

2T2.1 Input into plant designers' ITAAC documents and designs.

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* Indicates that this item is an ongoing issue and is a fundamental part of the mission of NUMARC. Specific actions related to this issue are treated separate from this plan.

2T2.2 Input to plant designers on level of detail required for design certification.

2T3 To Block 5--Initiation of site approval activities.

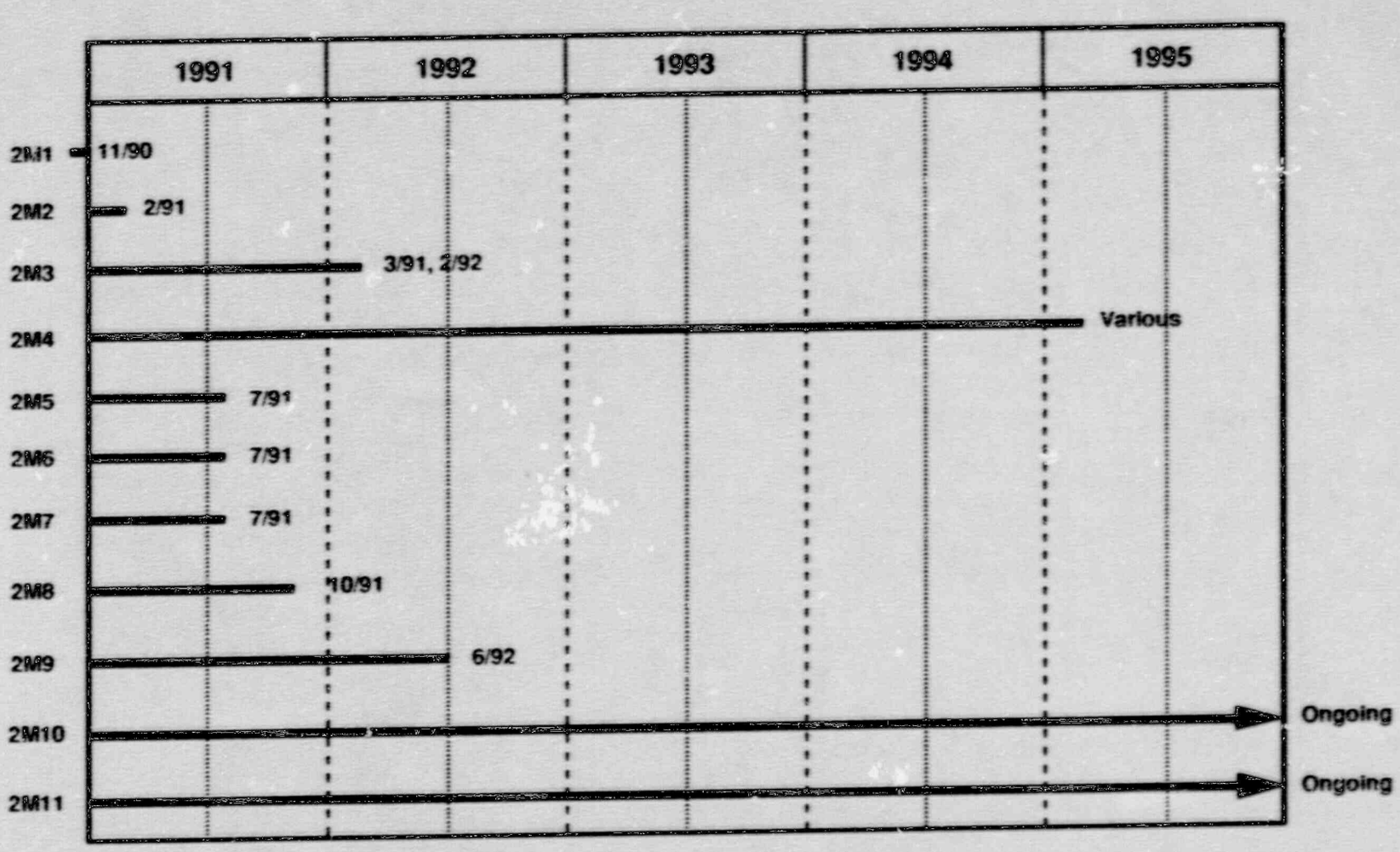
2T4 To Block 6--Closure on issue of level of detail required for design certification.

2T5 To Block 7--Stable regulatory basis for enhanced standardization beyond design.

2T6 To Block 8 --Communications support for legislative actions.

2T7 From/to Block 14--Legislation to support predictable licensing.

Schedule Display for Block 2



ACTION PLAN FOR BUILDING BLOCK #3: ALWR UTILITY REQUIREMENTS

I. Goals and Responsibilities

Goals:

1. Complete ALWR Utility Requirements Document and obtain NRC approval.
2. Assure that ALWR designs meet the intent of the ALWR Utility Requirements Document.

Responsibilities:

Industry Lead	EPRI-USC
Primary	EPRI-USC/Plant Designers
Industry Supporting	NUMARC
Government Supporting	DOE
Regulatory	NRC

II. Summary Action Plan

The Utility Requirements Document for future ALWRs has three primary purposes:

1. to identify the plant safety, reliability, and economic characteristics vital to the owner-operator, reflecting the more than two decades of construction, operating, and maintenance experience with LWRs;

2. to define generic regulatory requirements applicable to ALWRs, and

3. to establish a fundamental level of standardization based on common owner-operator and regulatory requirements.

The EPRI ALWR Program, under the leadership of the ALWR USC, has developed such ALWR Utility Requirements Documents over the last several years: one set for plants of large output, termed "evolutionary" ALWRs and one set for ALWR plants of mid-size output, with "passive" cooling features. These two 13-chapter sets of requirements, in combination with an executive summary, comprise the three substantial volumes of documentation that have been developed to meet quantitatively the following major goals: a higher level of safety, greater and longer lifetime reliability, substantial simplification, improved economics, and shorter construction times. The ALWR Requirements Document for Evolutionary Plants was approved by the ALWR USC and transmitted to NRC in 1987 to 1989 on a chapter-by-chapter basis. NRC review and response to this initial submittal is in progress.

At its January 1990 meeting, NPOC endorsed the Utility Requirements Document preparation, NRC review, and the role of the ALWR USC to interface with plant designers and NRC on these matters.

A major revision or "roll-up" of the Evolutionary Plant ALWR Requirements Document has been completed which incorporates NRC and industry comments and fully integrates the entire document. This revised document was submitted to NRC on September 7, 1990. NRC will complete their review of the Evolutionary ALWR Requirements Document and will develop a final Safety Evaluation Report by March 1991. It is intended that all major regulatory issues on Evolutionary ALWRs will be resolved by this time.

Based on the evolutionary plant work, an ALWR Requirements Document for the ALWR passive plant has also been developed. It was approved by the ALWR USC and was submitted to NRC on September 7, 1990. This ALWR Passive Plant Requirements Document is a self-standing document which includes many of the requirements established for the evolutionary plant but also stipulates requirements to cover the use of passive means of providing emergency cooling and further major simplifications. The NRC review of this document has been defined by the NRC Commissioners and the ALWR USC as being the forum for resolution of regulatory issues on ALWR passive plants, prior to the NRC review of a detailed design for certification.

A review has been completed of the design information developed by the plant designers for the evolutionary plants, which shows a substantial level of conformance with the Utility Requirements Document. A similar review of the passive plants is being conducted to assess their conformance with the Utility Requirements Document. It is the industry's intent for passive plants to achieve full conformance.

This same type of assessment will be continued through the first-of-a-kind engineering effort to ensure that the additional design development beyond that required for certification is also in conformance with the ALWR Utility Requirements Document. This activity will be conducted for both evolutionary and passive designs over a four-year period from 1991 to 1995

III. Milestones

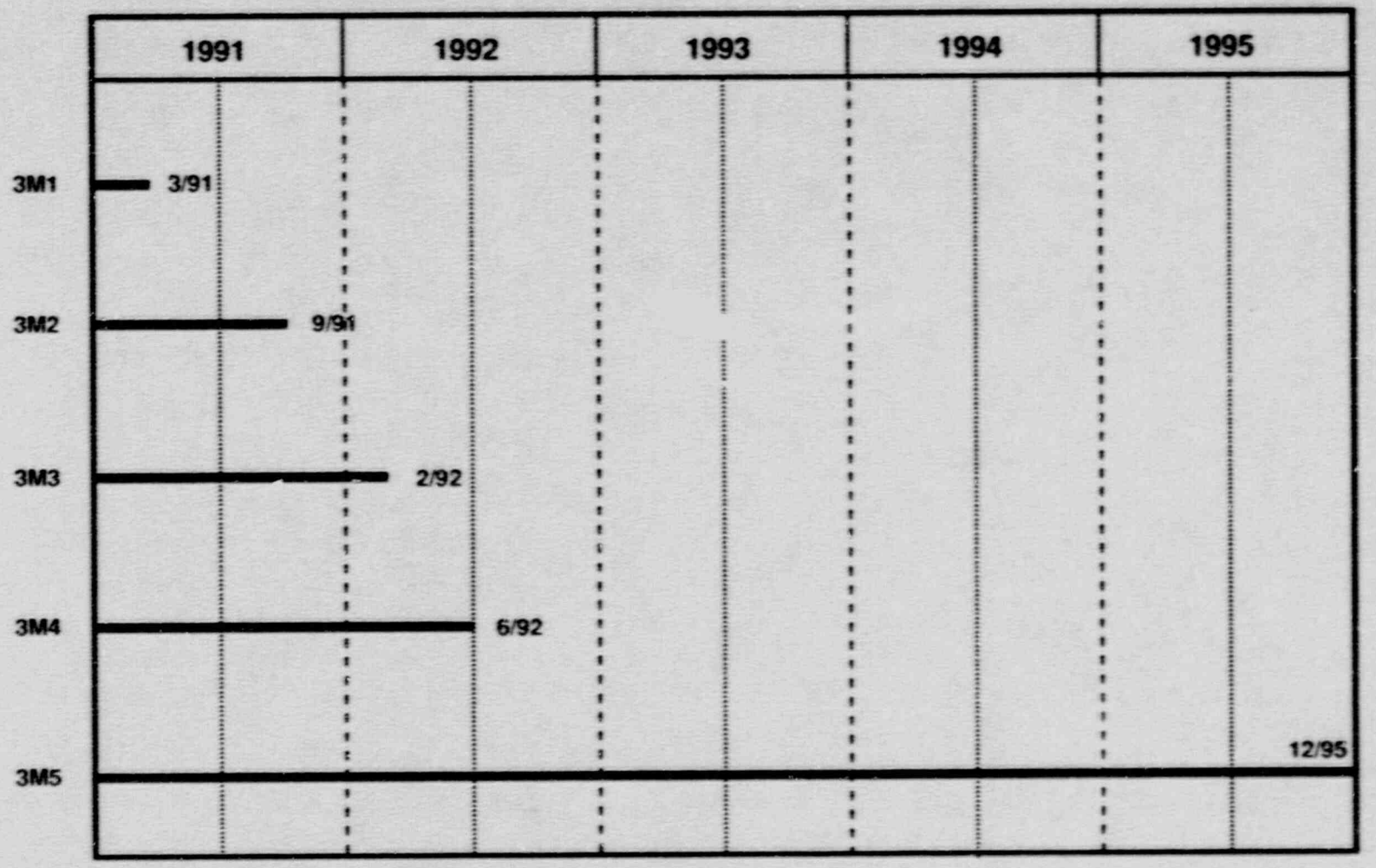
3M1	NRC final SER on evolutionary ALWR Utility Requirements Document.	3/91
3M2	Formal endorsement by utility CEOs of ALWR Utility Requirements Document.	9/91
3M3	NRC final SER on passive ALWR Utility Requirements Document.	2/92

3M4	Assess passive ALWR certification design conformance to the Utility Requirements Document.	6/92
3M5	Assess passive ALWR first-of-a-kind engineering design for conformance to the Utility Requirements Document.	12/95

IV. Tie-Ins

3T1	From Block 1--Input of operating experience from current plants to development of ALWR requirements.	
3T2	To Blocks 4, 5, 6 and 7--Evolutionary ALWR Utility Requirements Document (Revision 1) submittal, and Passive ALWR Utility Requirements Document (Revision 0) submittal, to NRC and plant designers as basis for initial design certification submittals to NRC, enveloping siting parameters, first-of-a-kind (FOAK) engineering development, and design basis for standardization beyond design.	9/90
3T3	To Blocks 4, 5, 6 and 7--NRC final SER on evolutionary ALWR Utility Requirements Document (confirmatory input to augment 3T2).	3/91
3T4	To Blocks 4, 6 and 7--NRC final SER on passive ALWR Utility Requirements Document (confirmatory input to augment 3T2).	2/92
3T5	To Block 4--Assess certification designs for conformance to passive ALWR Utility Requirements Document.	6/92
3T6	To Block 6 --Check of FOAK engineering design conformance to passive ALWR Utility Requirements Document.	12/95

Schedule Display for Block 3



ACTION PLAN FOR BUILDING BLOCK #4: NRC DESIGN CERTIFICATION

I. Goals and Responsibilities

Goal:

Obtain NRC certification of ALWR designs.

Responsibilities:

Industry Lead	Plant Designers
Primary	NRC
Industry Supporting	EPRI-USC/NUMARC/ANEC/USCEA
Government Supporting	DOE
Regulatory	NRC

II. Summary Action Plan

Industry, government and utilities are undertaking a cooperative program to achieve the goal of making advanced light water reactor (ALWR) designs investor-ready and certified by the NRC. The certification efforts and their supporting technology programs are closely coordinated with the EPRI ALWR Program to assure that plant designers' submittals to the NRC are consistent with the ALWR Utility Requirements Document. Funding for this effort is being provided by DOE, individual plant designers, and EPRI. Further, an agreement has been established between DOE, EPRI, and the passive ALWR certification applicants to facilitate the interface and assure this consistency between the individual plant designers' certification designs and the utility requirements.

Major policy issues will be addressed via industry initiatives. Major technical issues will be addressed by the ALWR Utility Requirements Document. The required level of detail, the format and content of the ITAACs and the design certification rulemaking, and NEPA design alternative issues will be addressed via the NUMARC Standardization Oversight Working Group.

Evolutionary ALWRs

The Advanced BWR (ABWR) is the lead ALWR under a DOE-sponsored design certification program to demonstrate the NRC's new standard plant licensing process in the United States and to make a certified ALWR available to U.S. utilities. The certification is being obtained for an essentially complete plant and for an envelope of site parameters which encompasses most U.S. sites.

The 1350 MWe GE / BWR is an evolutionary ALWR developed by an international team of BWR manufacturers to respond to the needs of worldwide utilities in the 1990s. It is based upon proven technology and is backed by extensive test and development. It has been adopted as the next generation standard BWR for Japan, and a two-unit lead project is underway for the Tokyo Electric Power Company. The ABWR has been adapted to U.S. utility needs and conforms to a high degree with the EPRI ALWR Utility Requirements Document. It is expected that the NRC will issue a design certification for the ABWR in June 1992.

ABB-Combustion Engineering's System 80 Plus^{tm} nuclear power plant is a 1300 MWe advanced PWR design developed in compliance with the EPRI ALWR Utility Requirements Document. The design consists of an essentially complete plant. It is based on the standardized System 80 nuclear steam supply system in operation at Palo Verde Units 1, 2 and 3, and the Duke Power Company P-81 balance-of-plant that was partially constructed at the Cherokee plant site. Elements of the System 80+ design are included in two units currently under construction in South Korea that will form the basis of the Korean standardization program. The Combustion Engineering Standard Safety Analysis Report (CESSAR-DC) is being submitted to the NRC in modules and is currently under NRC review. Design certification is expected by the end of 1992.

Passive ALWRs

The term "passive ALWR" refers to a mid-size ALWR with conventional or evolutionary reactor and auxiliary systems, but with safety systems for emergency cooling and containment heat removal that rely on passive or natural means such as gravity.

The Westinghouse AP 600 and General Electric SBWR will be the first passive plants submitted for certification under 10 CFR 52. To meet the present plant designer schedules of having the AP 600 certified by December 1994 and the SBWR certified by February 1995, considerable effort and continuing dialogue with the NRC will be required. These schedules are needed to support the NPOC objective of plant(s) on line by the year 2000.

The current DOE program supports the design effort required to advance Passive Plant Conceptual Designs developed in an earlier phase to certified designs. This includes developing plant designs with a level of detail consistent with the requirements of 10 CFR Part 52, completing the tests for demonstrating performance of safety features and the analytical models, completing the required documentation for the design certification submittal (SSAR, PRA and ITAAC), and completing the certification process.

Westinghouse and General Electric have participated in the development of the EPRI ALWR Utility Requirements Document for passive plants. The requirements have continually been compared to the plant designs as a part of their

development process. Westinghouse and General Electric intend to work with EPRI and the USC to reach satisfactory resolution with NRC of technical issues through the Utility Requirements Document, and intend to comply with these requirements. Westinghouse and GE have also been active participants in the development of the NUMARC ITAAC document and will adopt the approach that the NRC recommends following their review.

III. Milestones

Because there are milestones for four different ALWRs by three different vendors, the milestones will be listed separately and identified by adding GE, W, or ABB-CE to the milestone number.

Westinghouse

4M-W1	Standard Safety Analysis Report (SSAR)		6/92
	4M-W1.1	Comments from NRC on plant description report Feedback from the NRC on acceptability of approach to nonpolicy issues in AP 600 plant description report is required to reduce engineering rework. Action: NRC/Westinghouse	12/90
	4M-W1.2	W Preliminary safety studies Preliminary safety studies required to support design. Action: Westinghouse	12/90
	4M-W1.3	W Final safety studies Final safety studies required to complete Chapter 15 of SSAR. Action: Westinghouse	3/92
	4M-W1.4	EPRI Utility Requirements Document Vehicle by which the policy and technical issues are to be resolved. Early discussions with NRC staff required are to reduce engineering rework. SSAR cannot be practically completed and filed until these issues resolved. Draft NRC SER scheduled for release 5/91. Final NRC SER on passive plant requirements expected 2/92. Action: EPRI/NRC/Plant Designers	3/92
4M-W2	Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Document		6/92
	4M-W2.1	W Preliminary ITAAC document Draft of ITAAC document several months prior to being submitted for NRC review to	4/92

		allow appropriate internal and industry reviews. Action: Westinghouse	
4M-W3	Probabilistic Risk Assessment (PRA) report		6/92
	4M-W3.1	NRC PRA methods review Methods used in PRA studies must be reviewed by NRC to ensure acceptability once submitted for final review. Action: Westinghouse/NRC	12/90
	4M-W3.2	W complete PRA calculations Final PRA studies required by 10 CFR Part 52 to the NRC as part of design certification process. Action: Westinghouse	3/92
4M-W4	NRC Safety Evaluation Report (SER)		6/93
	4M-W4.1	First ACRS meeting ACRS required to review and approve AP 600 design in SER process after completion of ALWR Utility Requirements Document review. Action: NRC/Westinghouse	2/92
	4M-W4.2	First round NRC questions Questions asked as part of NRC review. Attempts are made to provide oral responses to questions during technical meetings to expedite review process. Action: NRC/Westinghouse	9/92
	4M-W4.3	W responses Provided to NRC requests for additional information (RAIs). Action: Westinghouse	11/92
	4M-W4.4	Second round NRC questions Asked as part of NRC review process. Attempts are made to provide oral responses to questions during technical meetings to expedite review process. Action: NRC/Westinghouse	1/93
	4M-W4.5	W responses Responses provided to the second round NRC RAIs. Action: Westinghouse	3/93
	4M-W4.6	Draft SER Draft SER is written by NRC on AP 600 design. This draft SER reviewed by ACRS as final step in their review process. Action: NRC	4/93

	4M-W4.7	ACRS letter ACRS required to issue a letter to Commission recommending AP 600 design be approved. Action: NRC/Westinghouse	6/93
4M-W5	Final Design Approval (FDA)		12/93
	4M-W5.1	Application for FDA Filed requesting a final design approval be issued and notice given of intent to apply for design certification. Action: Westinghouse	6/92
4M-W6	Environment Impact Statement (EIS)		12/93
	4M-W6.1	Draft EIS Part 52 requires draft Environmental Impact Statement be filed as part of design certification. Action: Westinghouse	6/93
	4M-W6.2	Public comments due EIS will be published for comment. Action: NRC/Public	9/93
4M-W7	Design certification		12/94
	4M-W7.1	Establish hearing procedures Procedures to be used in design certification hearing process established to provide framework for completion of design certification process. Action: NUMARC/Westinghouse/NRC	12/91
	4M-W7.2	W petition for rulemaking Petition requesting rulemaking for AP 600 required to initiate post-FDA part of design certification process. Action: Westinghouse/NRC	10/92
	4M-W7.3	W draft DC design certification rule Draft AP 600 design certification rule will be prepared to support design certification rulemaking activities. Action: Westinghouse	10/92
	4M-W7.4	Federal Register notice of design certification rulemaking Draft AP 600 design certification rule published in Federal Register. Comments requested in 90 days. Action: NRC/Westinghouse	12/92
	4M-W7.5	Appointment of hearing board AP 600 design certification hearing board appointed. Early appointment of board is	12/92

	desirable to support public comment complication and provide time for hearing board to become familiar with issues. Action: NRC	
4M-W7.6	Public comments due Public comments on AP 600 design certification rule received by NRC. Action: Public/NRC	3/93
4M-W7.7	SER issued NRC safety evaluation report issued by NRC documenting acceptability of AP 600 from safety viewpoint. Action: NRC/Westinghouse	6/93
4M-W7.8	Request additional comments Request for additional comments on AP 600 design certification rule is made to incorporate any new information contained in SER. Action: NRC	6/93
4M-W7.9	Public comments due Public comments received by NRC on AP 600 design certification. Action: Public/NRC	9/93
4M-W7.10	Informal hearing Informal hearing held to consider AP 600 design certification rule, comments received from public and need for a formal hearing. Action: NRC/Westinghouse	12/93
4M-W7.11	Hearing board preliminary decision Hearing board issues preliminary decision on AP 600 design certification rule, including whether a formal hearing is required. Action: NRC	2/94
4M-W7.12	Formal hearing (if required) Formal hearing held on AP 600 design certification rule, if required. Action: NRC/Westinghouse	7/94
4M-W7.13	Hearing board final decision Final decision reached by hearing board on AP 600 design certification rule. Action: NRC	10/94
4M-W7.14	Final notice of DC rule Final AP 600 design certification rule published in Federal Register. Action: NRC	12/94

4M-W8	Funding review Review of AP 600 design certification program funding held to ensure adequate financial support being provided to meet above milestones.		Annually

ABB-Combustion Engineering

4M-ABB-CE1	Design certification of System 80+ ALWR		
	4M-ABB-CE1.1	Complete CESSAR-DC submittals; completion of Standard Safety Analysis Report for System 80+ standard design. Action: ABB-CE	12/90
	4M-ABB-CE1.2	NRC Round 2 question responses; complete responses to NRC questions on System 80+ design. Action: NRC/ABB-CE	9/90
	4M-ABB-CE1.3	ACRS subcommittee meetings on System 80+ designs; continued ACRS review of System 80+ design. Action: NRC	Quarterly 1990-91
	4M-ABB-CE1.4	Submit inspections, tests, and analyses for System 80+ design certification. Action: ABB-CE	3/91
	4M-ABB-CE1.5	NRC issue draft safety evaluation report identifying conclusions of NRC safety review and any open issues. Action: NRC	9/91
	4M-ABB-CE1.6	ACRS full committee meetings and issuance of ACRS letter on safety review of System 80+ design. Action: NRC	10/91
	4M-ABB-CE1.7	Amendment to CESSAR-DC to address open issues and ACRS comments. Action: ABB-CE	11/91
	4M-ABB-CE1.8	NRC staff issue safety evaluation report documenting acceptability of System 80+ design from a safety viewpoint. Action: NRC	12/91

	4M-ABB-CE1.9	NRC issue final design approval; approval valid for referencing in construction permits and operating license applications. Action: NRC	12/91
	4M-ABB-CE1.10	NRC issue proposed design certification rule Action: NRC	3/92
	4M-ABB-CE1.11	Public comments on proposed design certification rule; requests for hearings, if any. Action: NRC	5/92
	4M-ABB-CE1.12	Initiate public hearing, if requested. Action: NRC	8/92
	4M-ABB-CE1.13	Complete hearings and hearing record; final board decision on System 80+ design. Action: NRC	10/92
	4M-ABB-CE1.14	System 80+ design certification issued; final System 80+ design certification rule approved by Commission. Action: NRC	12/92
4M-ABB-CE2	Approval of DOE funding		Annually
	4M-ABB-CE2.1	DOE approve matching funding for System 80+ design certification. Action: DOE	

General Electric

4M-GE1	Evolutionary ABWR plant certification obtained		6/92
	4M-GE1.1	NRC issues SER for the ABWR Standard Safety Analysis Report. NRC issues a safety evaluation report documenting the acceptability of the ABWR from a safety viewpoint. Action: NRC	3/91
	4M-GE1.2	NRC staff issues FDA for ABWR. NRC staff issues its final design approval for the ABWR. Action: NRC	3/91
	4M-GE1.3	ABWR design certification issued. Final ABWR design certification published after conducting hearings. Action: NRC	6/92

4M-GE2	Passive SBWR standard SAR submitted to NRC		8/92
	4M-GE2.1	Specify system interfaces. Supports safety review. Action: GE	9/91
	4M-GE2.2	Initiate preparation of the SSAR. Prepare chapters of standard safety analysis report, primary vehicle for NRC review. Action: GE	10/91
	4M-GE2.3	Submit SSAR to NRC Action: GE submit/NRC review	8/92
	4M-GE2.4	Complete SSAR submittal. Complete revisions/additions to SSAR for final review. Action: GE submit/NRC review	2/93
4M-GE3	Passive SBWR plant certification obtained		2/95
	4M-GE3.1	Submit draft LRB to NRC. Submittal of passive plant version of licensing review basis document initiates certification process. Action: GE	3/91
	4M-GE3.2	NRC issues SER on ALWR passive plant Utility Requirements Document. Safety evaluation report documenting acceptability of passive plant requirements to be used in design. Action: NRC	2/92
	4M-GE3.3	Issue approved LRB. NRC approves LRB.	8/92
	4M-GE3.4	Compare SBWR design to EPRI ALWR passive plant requirements. Action: GE	8/92
	4M-GE3.5	Complete system design.	12/93
	4M-GE3.6	Issue SER for SSAR. NRC issues a safety evaluation report documenting the acceptability of the SBWR from a safety viewpoint. Action: NRC	2/94
	4M-GE3.7	Issue FDA. NRC issues its final design approval for the SBWR. Action: NRC	2/94
	4M-GE3.8	Issue design certification. Final SBWR design certification published after concluding hearings. Action: NRC	2/95
4M-GE4	Approval of DOE, EPRI, and NSSS funding in support of ALWR Program.		Annually

IV. Tie-Ins

These tie-ins are generally applicable to all three plant designers. Dates for tie-ins will vary with design.

4T1 From Block 2--NUMARC input to plant designers on resolution with NRC of ITAAC requirements, level of detail required for design certification, and other 10 CFR Part 52 implementation issues.

4T2 From Block 3--ALWR utility requirements for the design, with integrated consensus utility requirements for all future ALWR designs and design resolutions of open regulatory issues.

4T3 From/to Block 5--Site parameters for standard design established by NRC-approved ALWR Utility Requirements Document and implemented in design certification.

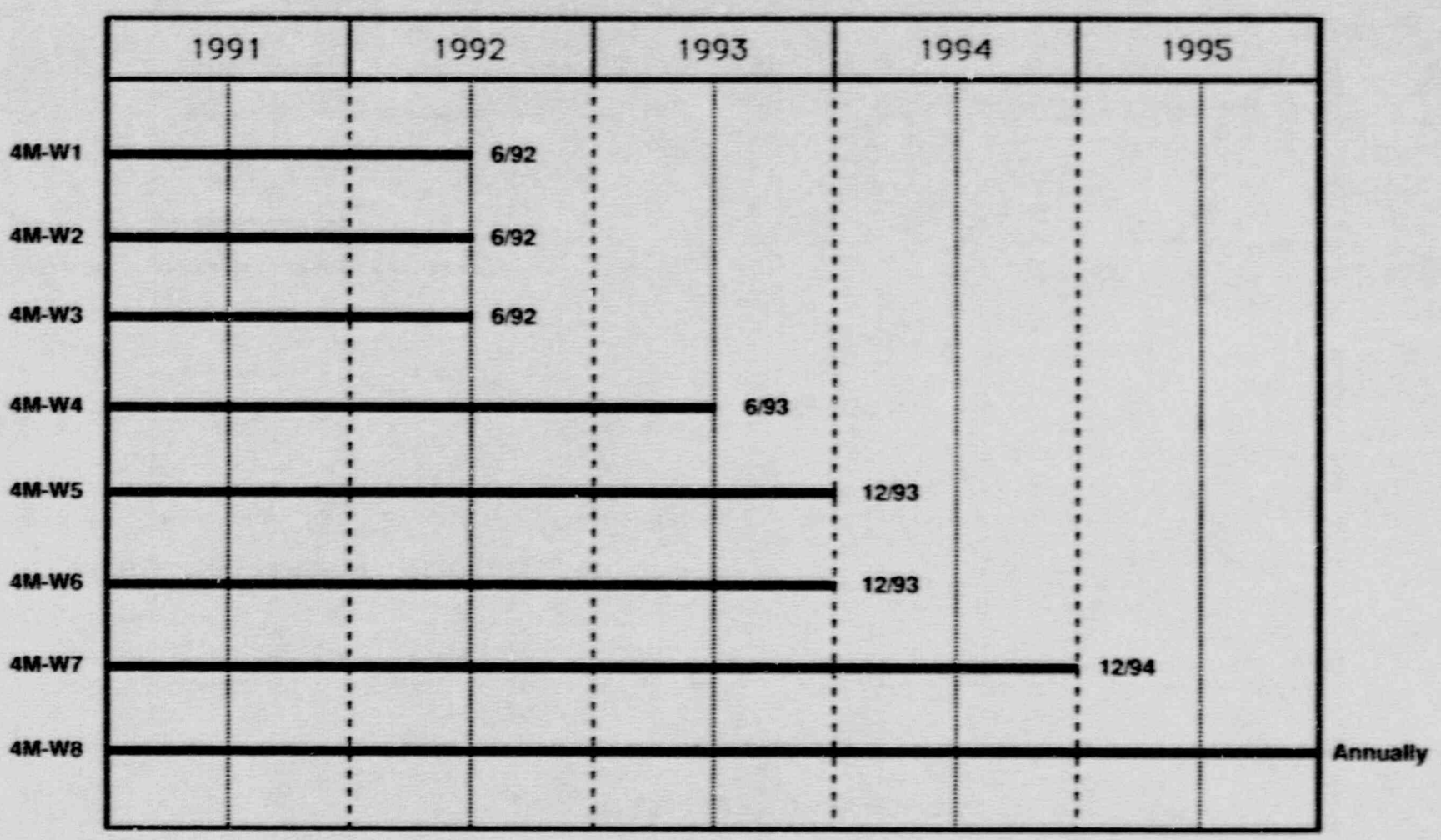
4T4 To Block 6--Design certification is starting point for first-of-a-kind engineering and will influence the approach taken to standardization beyond design certification.

4T5 To Block 7--Design input to approaches taken in standardization beyond design.

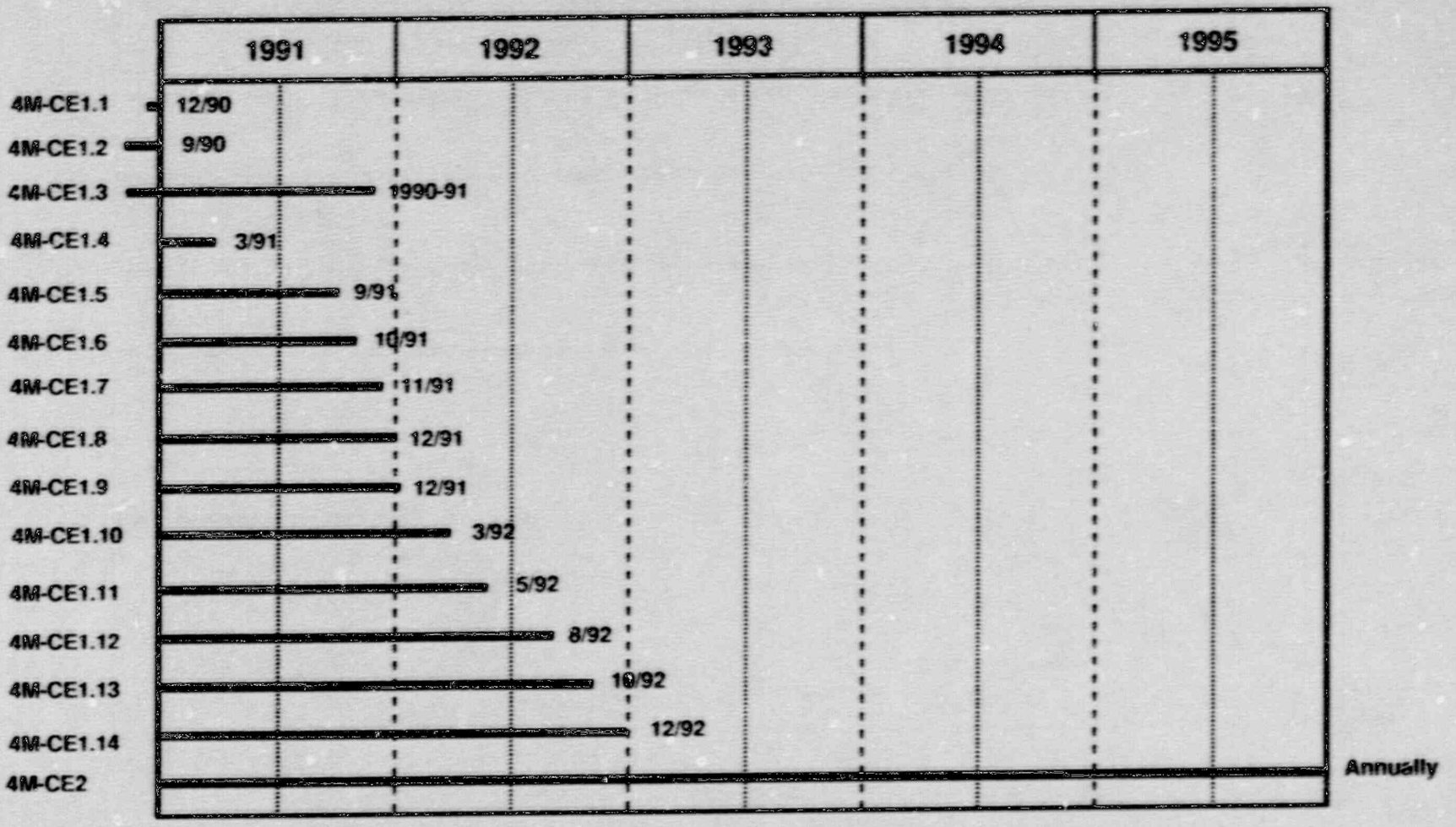
4T6 To Block 8--Individual design descriptions to assist in public communications.

4T7 From Block 13--Designs must consider relationship between fuel design and fuel availability.

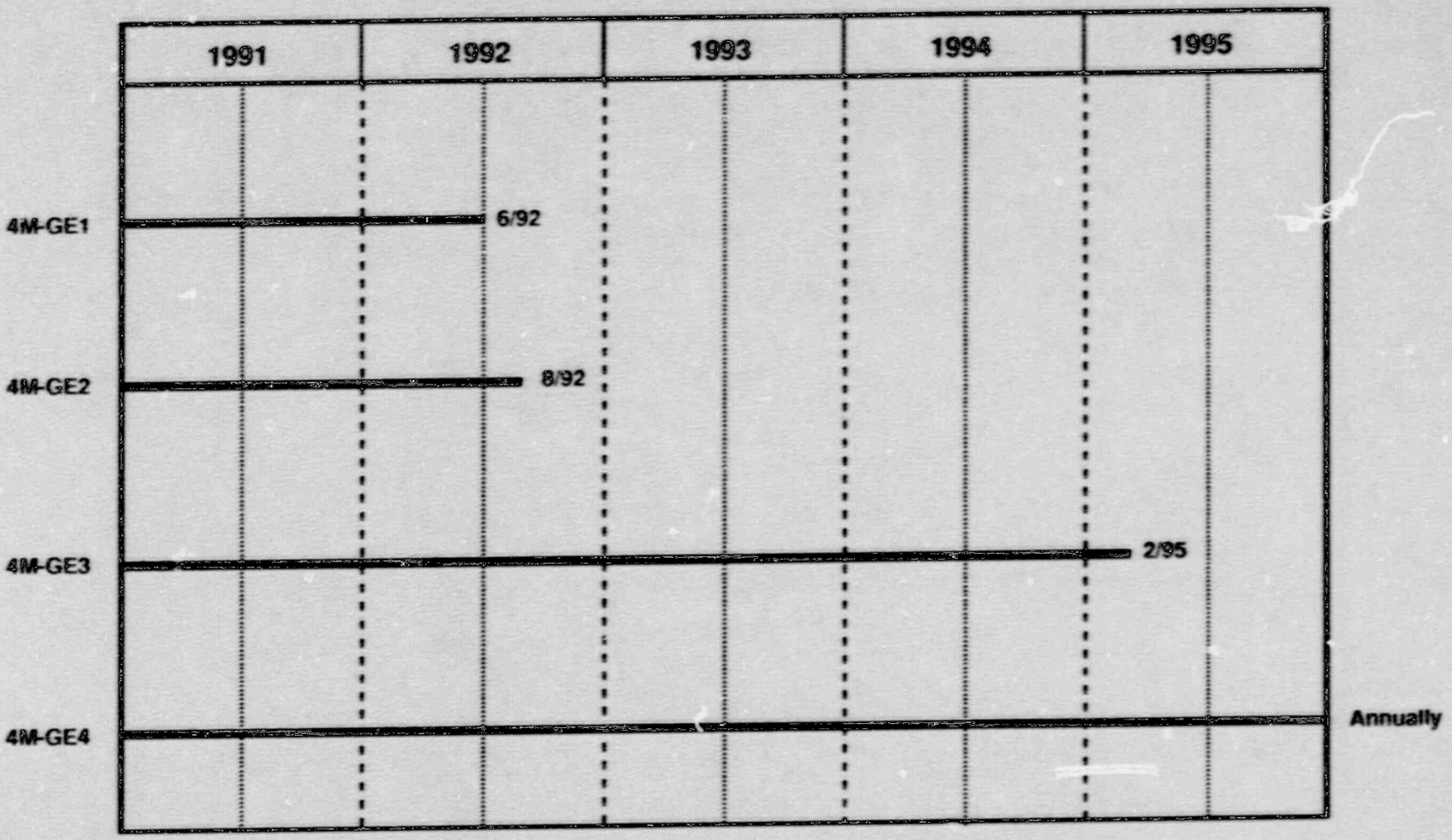
Schedule Display for Block 4
Westinghouse



Schedule Display for Block 4
ABB-Combustion Engineering



Schedule Display for Block 4
General Electric



ACTION PLAN FOR BUILDING BLOCK #5: SITING

I. Goals and Responsibilities

Goal:

Obtain NRC approval of suitable site(s) for new nuclear plants, either through early site permitting or through submission of an application for a combined construction and operating license and NRC approval to build and operate the plant to a certified design under its standardization rule.

Responsibilities:

Industry Lead	EPRI-USC/NUMARC
Primary	Utilities
Industry Supporting	ANEC/EEI/USCEA
Government Supporting	DOE
Regulatory	NRC

II. Summary Action Plan

The plan will be implemented in three phases: (1) evaluation (2) selection of preferred site(s) and their sponsors, and (3) pursuit of site(s) approval in the form of an early site permit followed by a combined construction and operating license (COL) or, alternately, a COL with a custom site.

Evaluation Phase.

This phase develops and then uses site selection criteria to evaluate suitable site(s), including consideration of sites selected in the DOE program described below. During this phase, work under Building Block #2 will identify any regulatory impacts directed toward identification of potential sites.

DOE has obtained budget approval to pursue an early site permit jointly with the industry at a level of $3M in fiscal year 1991 and $5M in each of fiscal years 1992 and 1993 on the condition that industry will provide an equal amount in cost sharing. This is an R&D program to demonstrate the early site approval process. DOE issued a request for quotation (RFQ) on July 16, 1990 thus initiating this program. It is expected that the industry will carry out this program by participating in the DOE program in keeping with the cost sharing provisions.

Explicit evaluation will be carried out on the relative merits of utilizing an early site permit, as compared to a COL program with a custom site for initial plant planning. In addition, the requirements spelled out in 10 CFR 52, Subpart A, will be evaluated so as to define a detailed plan for the implementation of the early

site permit process. Such a plan would be needed later, even if initial plant(s) siting utilized a COL only.

On completion of the evaluation phase, the industry timing for initiation of formal approval processes, whether for an early site permit or a COL, would be established.

The content of the evaluation phase of the plan is then:

1. Examination of existing sites which contain operating plants, or which have been previously qualified, to verify the adequacy of the site "enveloping" in the ALWR Utility Requirements Documents and the various standard designs which are under review for design certification.

2. Identification of potential sites throughout the country, with and without operating plants, with consideration of the state and local political climate, the viability of obtaining sponsorship, the identification of potential sponsors, and the achievement of standardization through joint sponsorship.

3. In conjunction with the DOE program, detailed definition of the implementation of the early site permit process, including detailed discussions with NRC, to be sure that the requirements are fully understood and can be practically carried out.

4. Evaluation of the relative merits and timing of utilizing the early site permit from the DOE program, utilizing an early site permit from a different site, or deferring to a COL process for a custom site for the initial plants. Another option that will be evaluated is to proceed directly with a COL for one or more lead plants on an already qualified site(s) to get an initial start(s) on nuclear plant construction. Assuming the start is successful, a process could be started to bank sites for the follow-up standardized plants utilizing the early site permit process.

A decision to utilize the early site permit in planning for initial plants would be deferred until the evaluation phase is completed. Milestone 5M5 shows completion of the evaluation phase in January 1992, at which time such a decision could be made.

To implement the plan, an industry siting group will be formed including utilities who each own or share ownership of a site, as well as plant designers and architect-engineers. These sites should be distributed through most regions of the country.

Selection and Approval Phases.

The selection phase, which will result in the determination of suitable site(s) and their sponsor(s), depends for its success on the results of the evaluation phase. Those results will provide the base from which the decisions and selections are made and the appropriate schedules defined. The approval phase will be the responsibility of the sponsor(s).

III. Milestones

5M1	Formation of industry siting group.	11/90
5M2	Response to DOE RFQ is made.	3/91
5M3	Evaluation phase initiated as part of DOE-sponsored early site permit program.	6/91
5M4	Establish timing for initiation of formal approval process.	12/91
5M5	Completion of evaluation phase.	1/92
5M6	Selection of candidate sites for evaluation, including presently approved sites; initiation of selection phase.	2/92
5M7	Submission of application for site approval.	2/93
5M8	Initiation of site characterization or review and updating of characteristics of presently approved site(s).	3/93
5M9	Receipt of site approval from NRC.	1993-1995*

IV. Tie-Ins

5T1 From Block 2--To provide specific experience in implementing NRC's Standardization Rule (10 CFR 52) and to resolve any regulatory issues identified during the site identification activities.

5T2 From Blocks 3, 4, and 6--To assure that the specific site characteristics fall within the enveloping site design parameters of the ALWR Utility Requirements Document and the standard designs being certified.

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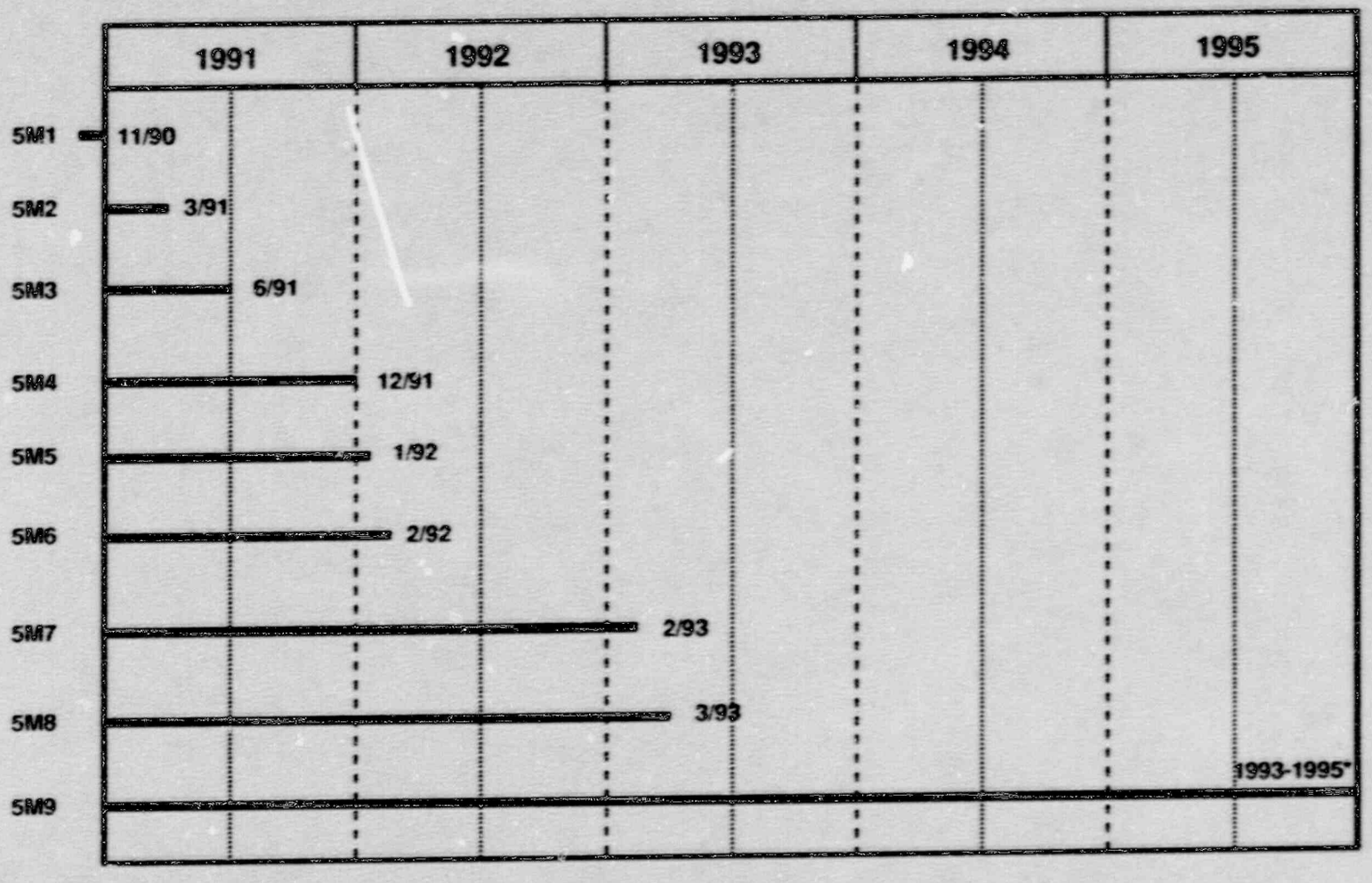
* Date could vary depending on whether site is for evolutionary ALWR (certifications anticipated in 1992) or for passive ALWR (certifications anticipated in 1995).

5T3 To Blocks 8 and 10--To determine timing of actions and coordinate with local communications programs; to address state and local regulatory and economic issues.

Schedule Display for Block 5



*Date could vary depending on whether site is for evolutionary ALWR (certifications anticipated in 1992) or for passive ALWR (certifications anticipated in 1995).

ACTION PLAN FOR BUILDING BLOCK #6: FIRST-OF-A-KIND ENGINEERING

I. Goals and Responsibilities

Goal:

1. Complete engineering on certified designs in sufficient detail to define firm cost estimates and prepare for construction of ALWR plants.
2. Ensure that an institutional infrastructure is in place to provide resources and manage completion of detailed design.
3. Define the process to achieve standardization in first-of-a-kind engineering.

Responsibilities:

Industry Lead	EPRI-USC
Primary	Plant Designers/AEs/DOE/Potential Owner/Operator(s)
Industry Supporting	NUMARC
Others	DOE/NRC

II. Summary Action Plan

First-of-a-kind engineering is that additional engineering, generally beyond the design certification scope, that is required to bring the entire plant design to essential completion, the utility-defined prerequisite to plant construction. First-of-a-kind (FOAK) engineering covers the complete engineering spectrum for the lead plant, including both nuclear steam supply system and balance-of-plant engineering, and including both standardized and some limited site-specific engineering. FOAK engineering builds on the ALWR utility requirements completed in Block 3 and on the design certification engineering completed in Block 4.

The final definition of FOAK engineering and its implementation details have not been established. However, some tentative ideas are being discussed. For example, FOAK engineering may include some procurement information, and will allow the final design detailed drawings to be completed. These drawings would likely include build-to-print drawings for modules and systems and detailed manufacturing drawings for all major components and packages (containment, reactor vessel, RCS piping, etc.).

First-of-a-kind engineering would not include construction support or startup and operational support.

One of the major issues in obtaining a utility commitment for a nuclear power plant has been the uncertainty in the cost of the plant. Early completion of the first-of-a-kind (FOAK) engineering will allow more creative financial packages to be developed, such as firm price, turnkey, or some type of risk sharing.

The FOAK engineering activities have been estimated at $200M to $300M or more per standard design. The cost of FOAK engineering will be influenced by the amount of detailed engineering conducted for design certification. Funding sources must be arranged to allow completion of this effort to support start of construction in 1994 to 1996. These construction start dates are design-dependent, but all support the NPOC goal of having standardized designs in operation by the year 2000. For construction to begin in this time frame, FOAK engineering work could be initiated as early as 1991 on areas which are unlikely to be changed by the certification process.

Funding could be provided in a number of ways and could involve one or more of the following:

- Owner funding with possible royalty payback for subsequent applications of design.

- Consortium of utilities, NSSS vendor, AE, etc. funding of initial effort with multiple applications anticipated.

- Government funding with possible royalty arrangement for application.

The following are NPOC-proposed definitions of levels of design detail, in the context of both NRC regulations and industry commitment to standardization, for various design engineering categories. It must be understood that all of these categories are new and untried partitions of the total plant engineering work scope. Detailed implementation of 10 CFR Part 52 necessitates these distinctions. While work continues under Block 2 to better define level of detail for design certification, the FOAK engineering effort demands an early attempt to anticipate the Block 2 resolution and to establish proposed definitions for the later engineering categories. These definitions will be updated as needed.

Level of Design Detail for Certification

Part 52 requires that sufficient information will be provided in the application to enable the NRC to make its safety determinations, as well as to determine the adequacy of Standard Safety Analysis Report (SSAR) information for assuring construction conforms with the design. A definition and discussion of this subject is provided in Block 2. It is the industry's intent that ALWR plant designs being submitted for design certification include the level of detail necessary to demonstrate conformance to the design safety limits and criteria, and the level necessary for the preparation of procurement, construction and installation

specifications. Part 52 recognizes that design certification will precede actual procurement and construction and that much of the detailed design documentation is not necessary for the Commission to reach its safety conclusions. Part 52 also recognizes that level of detail for design certification will vary based on the safety significance of the system. The SSAR documentation will define all critical design specifications and criteria, plant general arrangements, equipment location, P&IDs, one line electrical drawings, major pipe and cable routing, and quality assurance requirements. Definitions will be provided for related Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) that are necessary to demonstrate that the nuclear power facility is built according to its licensing bases.

This certification effort is currently funded in the $100 to 200 million range. This amount is generally in line with industry and DOE interpretation of the level of detail required for design certification by Part 52. This effort will be completed in accordance with Block 4, NRC Design Certification.

Level of Design Detail for Application for Combined Operating License (COL)

This level of engineering detail would be identical to the level of design detail for design certification, plus certain site-specific systems descriptions required by 10 CFR Part 52, such as service water intake structure and ultimate heat sink.

Level of Design Detail for First-of-a-Kind Engineering

This area is not as well defined as the two categories above. FOAK engineering is generally beyond the design certification scope but can commence prior to completion of certification. The NPOC-proposed approach to first-of-a-kind engineering envisages a two-phase approach as follows:

- Design Level for Commercial Standardization--This is the level of first-of-a-kind engineering which can be performed generically and applied directly to all plants of the same design. Detailed engineering could proceed up to the point where further design would require identifying specific equipment vendors, which would limit competitive bidding. Procurement, construction, and installation specifications in terms of form, fit, and function for those components would then be prepared. Engineering performed in this phase would include piping stress analyses and preparation of piping isometric drawings based on generic equipment data. It would also include cable routing drawings. Architectural and structural design can be completed for the nuclear and turbine islands.

  Recognizing the need for flexibility for contingencies, first-of-a-kind engineering must consider specific hardware details and defer any engineering that would have to be redone for each plant if the equipment supplier changed. Most construction drawings will be essentially complete, except

for those features which are site-unique, such as the cooling water structures.

- Design Level for Construction--Prior to beginning of construction, some additional amount of engineering must be completed to account for site-specific and project-specific items. This includes engineering detail for the site-specific system descriptions required for a COL by Part 52, plus site-specific engineering that depends on local topography. Design level for construction would include procurement, interface engineering as needed to implement form, fit and function specifications, etc. Essentially all remaining construction drawings would now be completed, including those features which are site-unique, such as the cooling water structures. After purchase of equipment for a particular plant, the piping analyses would be reviewed to ensure that the detailed design meets all of the design requirements with the selected equipment. Additional analysis would be performed for the small connecting piping and the pipe supports would be engineered.

FOAK engineering can proceed beyond the level of detail required for design certification in parallel with design certification rulemaking. However, care must be taken not to complete FOAK engineering too early, since FOAK engineering changes driven by design changes occurring early in the certification effort would result in major reengineering of the details and a significant increase in the overall cost of the plant. In the past, such iterative designing in parallel with the licensing has been a significant factor in making the engineering costs for nuclear power stations excessively high. In view of these considerations, some of the effort in FOAK engineering should await an FDA of the design. Work related to major component design, balance-of-plant, and module construction/assembly can be completed prior to the issuance of the FDA.

Definition of Standardization--Having discussed standardization concepts in the context of the design and construction sequences, the following presents standardization from a functional viewpoint.

Standardization as applied to advanced light water reactors is a life-cycle commitment to the maximum economically practical uniformity in the design, construction, and operation of a family of nuclear power plants. Rigorous implementation of standardization is expected to help ensure high levels of safety, and to help achieve efficiency and economy typically associated with increases in scale or breakthroughs in technology.

NPOC proposes four stages of standardization in advanced light water reactors. The first stage is that standardization established by the ALWR Utility Requirements Document. The ALWR Utility Requirements Document specifies engineering requirements at a functional level. Therefore, for safety-significant areas (within the scope of NRC regulations), the Requirements Document may be less

detailed than design certification submittals. However for areas outside the scope of NRC regulations, such as layout, availability goals, balance-of-plant design, etc., it may specify more detail than will be included in design certification submittals to NRC.

The second stage is the standardization required in the application for NRC design certification. This certification level includes requirements--design criteria and bases, functional descriptions, and performance requirements for systems to assure plant safety. The level of detail will vary based on the safety significance of the system. The certification level of standardization includes the detailed design information sufficient for NRC to make final safety determinations. NRC review of design information beyond that point for the sole purpose of encouraging standardization is not necessary. The Commission should press for standardization of safety regulations but not for reviews of engineering detail beyond the regulations. Such reviews have the potential to result in major delays in achieving certification. The industry has taken the position that design certification reviews should be limited to the safety determinations required by regulation. The level of detail needed to achieve standardization within the scope of NRC's regulations is being resolved in Block 2 and impacts the level of detail included in Block 4.

The third stage of standardization, in addition to that required for design certification, is that which will enable the industry to achieve the efficiency and economy of commercial standardization. As such, it addresses design decisions beyond regulations. It includes all of the first-of-a-kind engineering needed to complete the nonrecurring engineering for a family of plants. Since the level of detail required above for design certification will vary based on the safety significance of the system, it follows that the starting point for commercial standardization will also vary by system.

The level of detail that will enable the industry to achieve the economic benefits of full design standardization beyond the regulations will be accomplished within FOAK engineering, and determines the relationship between the commercial standardization and the construction phases defined above. Industry commitment to achieve those economic benefits, in combination with modern techniques such as computer-aided drawing (CAD), will permit an economically optimum attainment of commercial standardization.

Standardization as defined above would be achieved in a phased manner as the design develops and the first-of-a-kind (FOAK) engineering is completed. The greater the level of FOAK engineering completion, the greater the level of standardization. As FOAK engineering commences, utility commitment to standardization needs to be formalized by establishing the ground rules and organizational entities that would control and maintain, within antitrust limitations, standardization in areas outside the regulations.

The fourth stage of standardization is enhanced standardization beyond design. This area, addressed by Block 7, includes the creation of the ground rules and organizational entities that would control and maintain standardization outside the regulations over the life of the plants. Commitment to such ground rules and organizational entities will ensure the economical and technical benefits of standardization could be achieved and maintained.

A utility group comprised of all potential owners of a series of plants using a given ALWR design could commit to utilize that design and work with the plant designer. That group might consider the specific suppliers who would provide the components for all plants in the series, or might consider which plant modifications should be made to all plants in a series. This utility group approach is being considered by the industry. The lead plant would typically represent the standard for the series of plants in this group. The concept of an ALWR plant design owners group also supports maintaining the design as a standard by allowing the benefits of shared spare parts, operator training, maintenance training and operating experience. These benefits of standardization beyond design are addressed in Block 7.

III. Milestones

6M1	Develop funding plan--Prospective funding sources identified to support the FOAK effort. Action: Plant Designers/DOE/EPRI	1/91
6M2	Identification of customer(s)--Identification of customer(s) ensures site-specific issues will be addressed early and FOAK engineering effort will be initiated. Action: Utilities/Plant Designers/DOE/EPRI	1/92
6M3	Initiate FOAK engineering--FOAK engineering can begin in parallel with the design certification process. Action: Plant Designers	1991*
6M4	Completion of FOAK engineering. Action: Plant Designers	12/94*

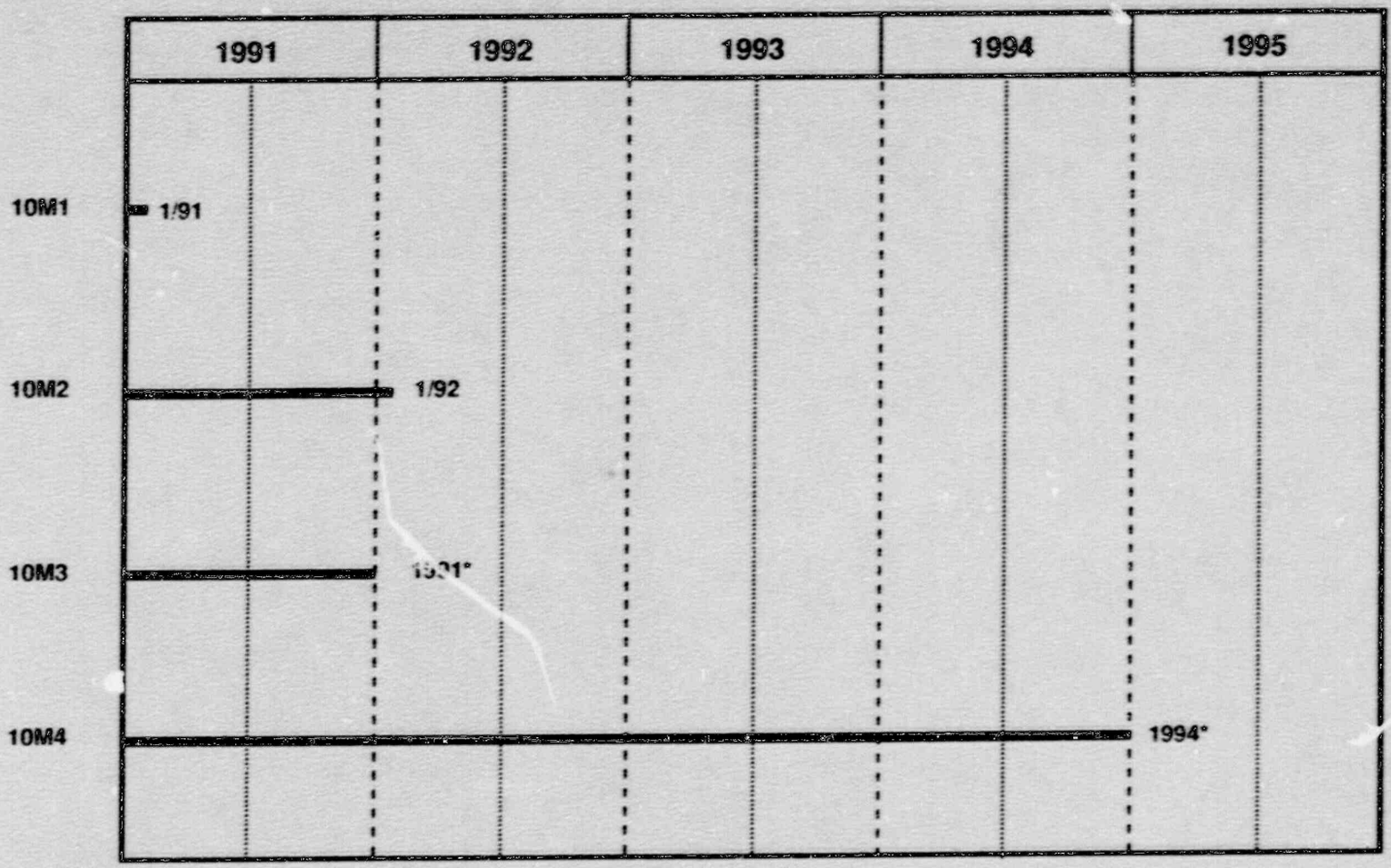
IV. Tie-Ins

6T1	From Block 2--Level of design detail. Closure needed on level of detail issue to allow definition of the format and content of the SSAR.	11/90

* Milestone date will vary with specific designs.

6T2	From Block 3--EPRI design requirements. ALWR Utility Requirements Document provides plant designers with design requirements for ALWR FOAK effort.	9/90
6T3	From Block 3--Final NRC-approved utility design requirements. Final ALWR Utility Requirements Documents will be used to check FOAK work completed since 6T2 and guide to the designers to complete FOAK engineering.	3/91 (EP) 2/92 (PP)
6T4	From Block 4--Description of the certified design. Certified designs from Block 4 provide the basic input to FOAK engineering effort. Dates vary by design.	Vary by design
6T5	From Block 5--Site identification, site parameters and timing of actions. Site identification will allow site-specific issues to be addressed during the FOAK engineering effort. Parameters for site selected in Block 5 will be reviewed as part of FOAK effort to ensure site compatibility.	Vary by design
6T6	From/to Block 7--Standardization beyond design. Requirements from Block 7 factored into FOAK engineering; FOAK to provide design basis for standardization beyond design.	12/90
6T7	To Block 7--Input on O&M Costs. FOAK engineering will provide sufficient design detail to define O&M costs for plant with increased certainty.	12/9[illegible]
6T8	To Block 9--Provide cost estimates for lead customer financing needs.	6/92
6T9	To Block 10 --Increased certainty of construction schedules and budgets. Level of construction certainty must be defined and factored into FOAK engineering.	12/91
6T10	From/to Block 13--Integration of fuel and plant. Coordinate special design features on fuel requirements. FOAK engineering must consider relationship between fuel design, availability a: d plant design.	6/92

Schedule Display for Block 6



*Milestone date will vary with specific designs.

ACTION PLAN FOR BUILDING BLOCK #7: ENHANCED STANDARDIZATION BEYOND DESIGN

I. Goals and Responsibilities

Goal:

Develop enhanced standardization concepts and cooperative arrangements as a means to increase the predictability of construction cost and schedules, and to improve operational reliability and cost.

Responsibilities:

Industry Lead	NUMARC
Primary	Plant Designers/AEs/Utilities
Industry Supporting	INPO/EPRI-USC/EEI
Others	DOE/NRC

II. Summary Action Plan

The objective of this building block is to review and evaluate options for, and the applicability of, standardization beyond that required by 10 CFR Part 52. The output from this phase of the plan will extend the benefits of standardization beyond design into construction and operation, by developing action plans, policies, working practices and procedures to expand standardization to gain the maximum efficiencies associated with the operations and management of a family of standardized commercial nuclear plants.

An industry working group has already been formed within NUMARC, the Standardization Oversight Working Group, to coordinate industry activities in regard to standardization. The ALWR Utility Requirements Document provides the initial input from which the working practices and methodologies for "enhanced standardization" will be developed.

A range of standardization alternatives will be assessed. The options to be considered will likely range from identical physical, functional, and performance characteristics of all structures, systems and components except for site-specific characteristics. Whereas, the other end of the range will be equivalent to the level of detail required by the specific design certification rulemaking. The industry believes that the economic benefits will result in a much higher level of standardization than that dictated solely for the benefit of safety through the specific rulemaking for a particular design certification.

The organizations associated with this building block will also investigate issues such as the applicability and the relevance of the 10 CFR 50.59 process to standardized facilities. Alternative change control procedures will be investigated

and developed based upon existing working practices to assure a degree of control and maintenance of standardization from COL approval to the end of plant life. The change control process will be tailored to assure that the competitive options available to the individual owner are not jeopardized by the restrictions that standardization might impose.

Other areas to be investigated will be standardized modification and design criteria, procedures, institutional issues as well as interutility cooperation in areas such as quality assurance, licensing, maintenance, technical inspection (ISI, etc.), spare parts, craft- and personnel-related issues associated with training and outages. A predictable licensing process coupled with utilities working in unison to resolve deficiencies and implement common modifications in standardized facilities should assist in reducing the operation and maintenance (O&M) costs of individual plants. A reduction in O&M costs from present operating plant trends will be necessary if the target operating costs shown in the Utility Requirements Document are to be achieved.

III. Milestones

7M1	Review the SOWG's charter in regard to standardization.	11/90
7M2	Define standardization beyond design pertaining to construction, startup, operations and maintenance, and change practices.	1/91
7M3	Assess the experience with standardization issues in current plants.	1/91
7M4	Assess the impact and the benefits accrued from the implementation of standardization practices in other countries.	3/91
7M5	Assess the standardization definitions in terms of cost, predictability and qualification of equipment suppliers.	6/91

IV. Tie-Ins

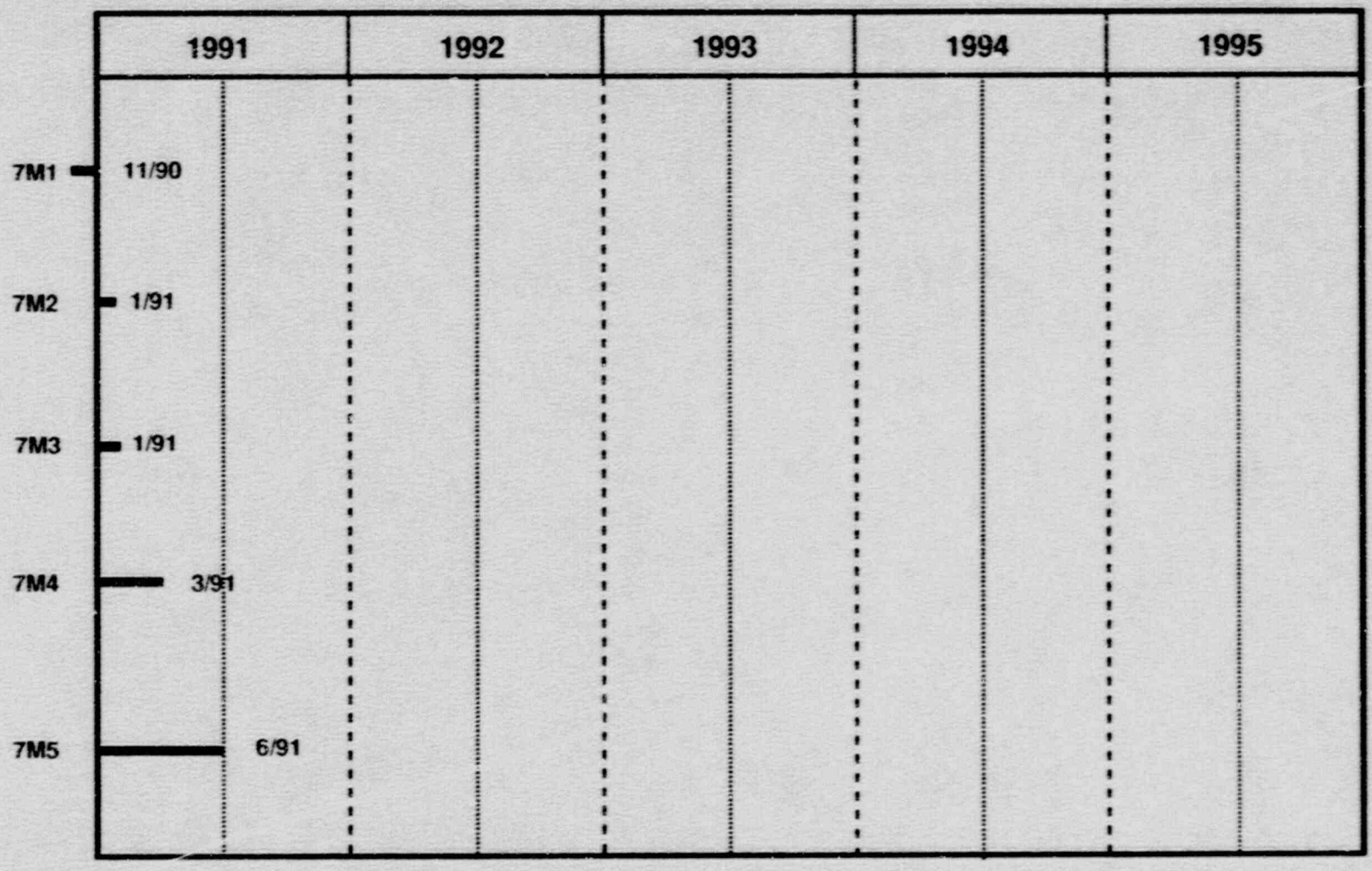
7T1 From Block 1--Provide input from current plant O&M cost analysis.

7T2 To Blocks 2, 3, 4--Provide input into the ITAAC process.

7T3 From Blocks 2, 3, 4--Technical basis and input into the processes, general working practices and philosophies of standardized activities beyond design.

7T4 From/to Blocks 9 and 10--Enhance the evaluation and the assessment of the financial issues and concerns.

Schedule Display for Block 7



ACTION PLAN FOR BUILDING BLOCK #8: ENHANCED PUBLIC ACCEPTANCE

I. Goals and Responsibilities

Goal:

1. Achieve broad U.S. public acceptance of nuclear power.
2. Achieve local public attitudes, at potential plant sites, which are conducive to plant construction and operation.

Responsibilities:

Industry Lead	USCEA
Primary	U.S. Nuclear Industry/DOE/NRC/ Congress/USCEA
Industry Supporting	ANEC/EEI/APPA/NRECA/NUMARC
Regulatory	NRC/State Regulatory Agencies

II. Summary Action Plan

The U.S. Council for Energy Awareness (USCEA) will achieve its goal in the strategic industry effort to build new nuclear energy plants by providing accurate and timely energy information with particular emphasis on commercial nuclear power, leading to sound public policy decisions.

The fundamental USCEA approach is to broaden public recognition that nuclear energy is a vital part of America's energy future. Major messages include:

- enhancing U.S. energy independence from imported oil from unstable regions;
- producing the electricity necessary for economic growth and international competitiveness; and
- protecting the environment and domestic natural resources.

USCEA communicates these messages in a coordinated effort that includes:

- advertising;
- conducting a broad range of media programs;
- providing communications support for the industry's regulatory and legislative initiatives;

- tracking public attitudes, through national opinion surveys, attitude research, and ad testing; and

- working with individual companies to advise on and assist in their regional and local communications efforts.

III. Milestones

8M1	Continue national communications on the benefits of and need for additional nuclear energy plants. Ongoing communications on nuclear energy's role in energy independence and on nuclear energy's environmental benefits.	
8M2	Complete communications efforts encouraging a high priority for nuclear energy in DOE's National Energy Strategy (NES).	12/90
8M3	Provide communications support for the industry's legislative and regulatory goals, including licensing reform, standardization, privatization of DOE enrichment facilities, etc.	
8M4	Help achieve significant progress toward establishing a high-level waste repository.	
8M5	Assist applicants for early site permits or combined construction/operating licenses with local communications programs, when potential sites for new plants are identified, to build understanding and acceptance prior to construction decisions.	
8M6	Achieve heightened awareness of the need for financial risk/reward balancing by state utility regulators.	
8M7	Inform the financial community of the need for, and financial viability of, additional nuclear energy plants. Financial analysts and financial media receive USCEA information as appropriate.	
8M8	Provide the technical basis for communications, legislative efforts, and policy development, in areas not covered by other industry organizations, including energy use and supply trends, economic aspects of electricity generation, the nuclear fuel cycle, insurance, international policy,	

radionuclides/pharmaceuticals, nuclear plant status, and advanced nuclear energy plants.

8M9 Monitor public acceptance of nuclear energy.

8M10 Enhance communications programs on the improvements in future advanced nuclear energy plants.

8M11 Provide information to the media on radiation issues.

8M12 Communication of performance status of U.S. operating plants.

The data from Block 1, Current Nuclear Plant Performance, on plant safety and reliability and from industry statistics on O&M and capital modifications costs will be summarized and reported publicly. Improved trends in this area are important in achieving public confidence in nuclear power.

IV. Tie-Ins

8T1 General--Information input to this block is required from all other blocks.

8T2 To Block 2--Predictable licensing and stable regulation.
Provide communications support to NUMARC and ANEC in support of respective regulatory and legislative initiatives.

8T3 To Block 5--Site identification.
Monitor candidate sites, when known; assist local efforts for increasing public understanding of need for/value of new nuclear energy plants.

8T4 To Block 9--Clarification of ownership and financing.
As appropriate, communicate with relevant audiences on ownership/financing options for new plants and on the competitiveness of new nuclear plants.

8T5 To Block 10--State economic and regulatory issues.
Support industry lead of EEI with relevant technical information and appropriate media support.

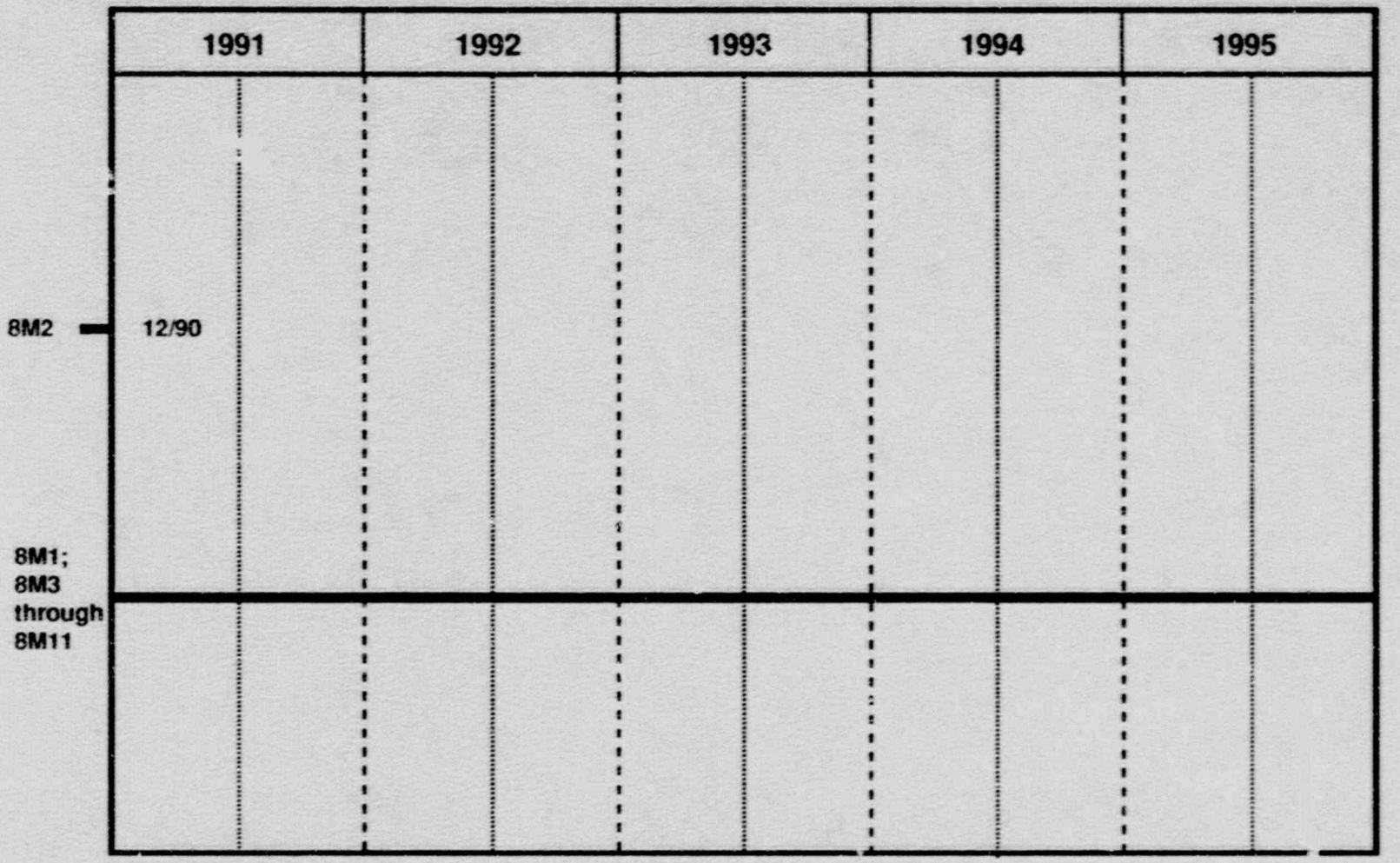
8T6 To Block 11--High-level radioactive waste.
Coordinate with ACORD-EEI on communications concerning the need and safety of a permanent repos.tory, on the safety/viability of existing utility storage of waste, on communications in Nevada supporting Yucca

Mountain characterization; coordinate actions in Nevada with ANEC; and on MRS.

8T7 To Block 12--Low-level radioactive waste.
Provide communications tools regarding low-level waste as disposal sites are opened under state compact process.

8T8 To Block 14--Enhanced governmental support
Serve as the communications arm for industry efforts to secure strong recognition for nuclear in government policies, including the National Energy Strategy; adequate funding for advanced reactor R&D and design certification; and legislation that strengthens NRC's licensing rule, etc.

Schedule Display for Block 8



ACTION PLAN FOR BUILDING BLOCK #9: CLARIFICATION OF OWNERSHIP AND FINANCING

I. Goals and Responsibilities

Goal:

Develop a structure for financing, ownership, and operation of nuclear plants which reasonably compensates investors/lenders for associated risks.

Responsibilities:

Industry Lead	EEI
Primary	FERC/SEC/Congress
Industry Supporting	ANEC/USCEA/Plant Designers
Regulatory	FERC/SEC

II. Summary Action Plan

In today's competitive environment and with the regulatory emphasis on least cost planning, the cost of power to the consumer from a nuclear plant will be a very important factor in determining whether or not such a plant will be built. Because nuclear plants are capital intensive, the form of ownership is an important determinant of costs.

Investors demand a return (reward) commensurate with the risk they undertake. The issue in seeking viable scenarios for nuclear plant construction is balancing risks and rewards.

Historically, nuclear plants have either been built by individual utilities under the traditional rate base approach or through some form of joint venture. Other forms of ownership may be appropriate to allow appropriate returns and to reduce risks as well as costs. Alternate forms of ownership may also allow for flexible, competitive pricing. Two recently cited examples which will be relevant are turnkey projects and independent power producers. The inclusion of non-utility owners is another, as is partial government financing.

Each of these options will be characterized and reviewed with regard to their influence on financing, construction, risk mitigation, and regulatory impact. An effort will be made to identify new, innovative approaches to removing perceived barriers. To some significant extent, this also involves changing the regulatory process to provide greater certainty, flexibility, and predictability. It also may involve removing perceived obstacles to innovative financing/ownership arrangements.

Important to owners/investors is insurance as a risk reduction method. Coverage of property, liability, and worker claims, as well as protection against plant outages, will be determined.

Because risk reduction leads to cost reduction, it is imperative in a highly competitive environment that potential risks be identified and addressed in all areas of the project, e.g., engineering, project management, and scheduling.

III. Milestones

9M1	Identify and summarize alternative forms of power plant ownership.	3/91
9M2	Obtain financial model.	6/91
9M3	Evaluate impact of current and potential ownership forms on site selection, financing/construction alternatives, cost and schedule.	12/91
9M4	Identify and attempt to quantify nuclear insurance-related risks and potential liabilities.	6/91
9M5	Review and identify perceived legislative, legal and regulatory constraints to implementation of the various forms of ownership.	9/91
9M6	Identify and evaluate options to formulate contracts for the sale of electricity, if made necessary by the form of ownership, in order to allow for flexible pricing of power and cost recovery.	3/92
9M7	Prepare written report.	6/92

IV. Tie-Ins

9T1 From/to Block 2--Predictable licensing and stable regulation
Review legislative, legal and regulatory constraints to implementation of the various forms of ownership.

9T2 From/to Block 5--Siting
Evaluate impact of current and potential ownership forms on siting, financing/construction alternatives, cost, and schedule.

9T3 From/to Block 6--First-of-a-kind engineering
Evaluate the level of confidence achieved in costs and schedules from the completion of first-of-a-kind engineering on risk allocation and its impact on current and potential ownership forms.

9T4 From/to Block 10--State economic regulatory issues
Review legislative, legal and regulatory constraints to implementation of the various forms of ownership.

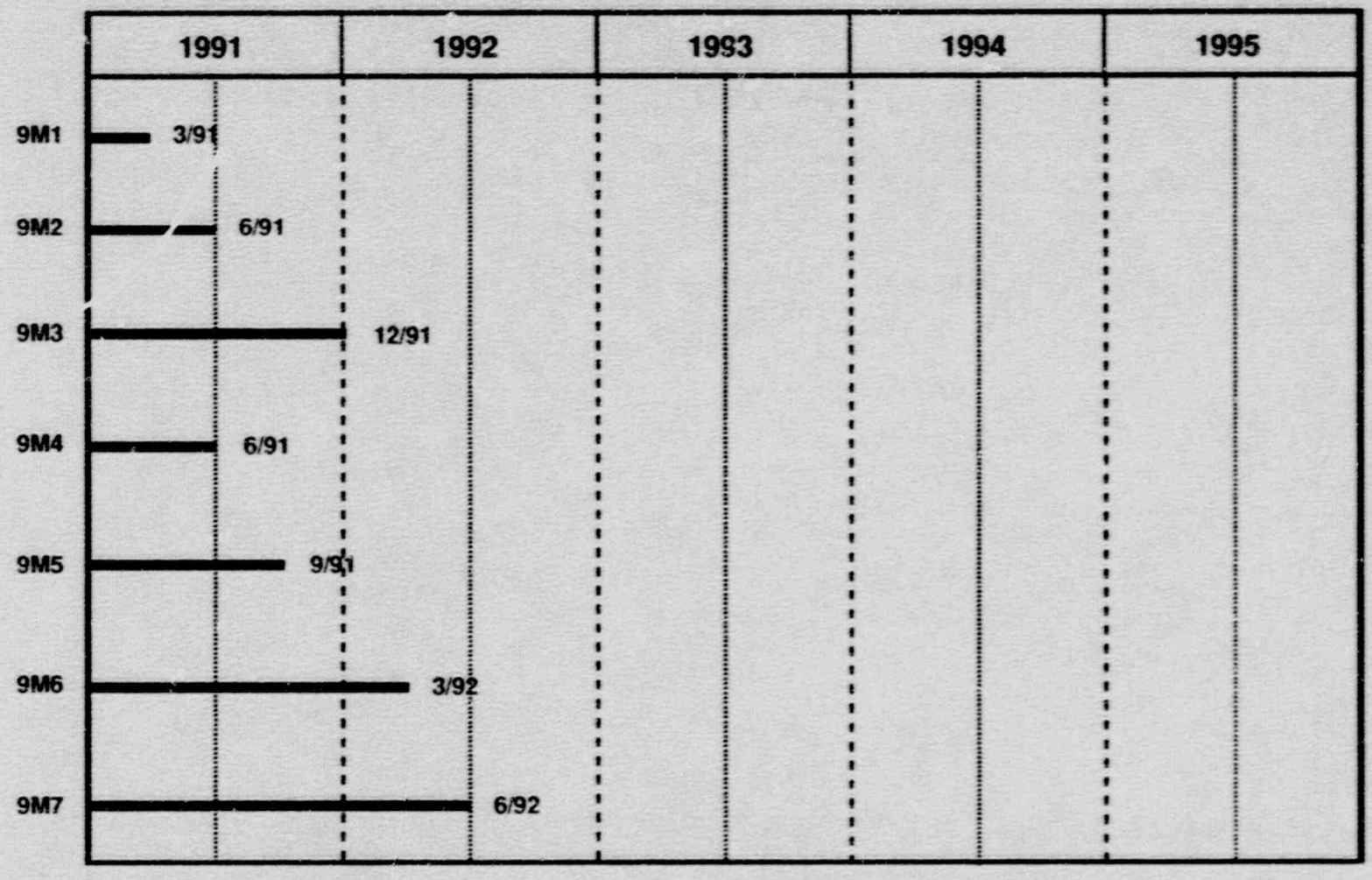
9T5 From/to Block 11--High-level radioactive waste
Identify and attempt to quantify nuclear insurance-related risks and potential liabilities.

9T6 From/to Block 12--Low-level radioactive waste
Identify and attempt to quantify nuclear insurance-related risks and potential liabilities.

9T7 From/to Block 13--Adequate, economic fuel supply
Obtain financial model (to assist in evaluating impact of fuel prices).

9T8 From/to Block 14--Enhanced governmental support
Review legislative, legal and regulatory constraints to the implementation of the various forms of ownership.

Schedule Display for Block 9



ACTION PLAN FOR BUILDING BLOCK #10: STATE ECONOMIC REGULATORY ISSUES

I. Goals and Responsibiiities

Goal:

Achieve support by state regulatory agencies for predictable and stable handling of permitting and financial matters.

Responsibilities:

Industry Lead	EEI
Primary	NARUC
Industry Supporting	USCEA/ANEC/NUMARC/APPA/ NRECA
Government Supporting	Regional states groups (e.g. Southern States Energy Board)
Regulatory	Individual State Regulatory Agencies

II. Summary Action Plan

The strategy for achieving Block 10 goals involves three principal elements. These are:

- Facilitating the adoption of "rolling prudence" or similar cost recovery procedures by state regulatory commissions to reduce the risk of new capital projects, including nuclear projects. ("Rolling prudence" implies a regulatory process that provides for periodic review of the cost and schedule performance of major capital projects).

- Developing generic cost recovery mechanisms which explicitly share risks among utility ratepayers, shareholders, and other investors, and do so appropriately and equitably. These mechanisms would be available for adaptation/modification by parties negotiating "preapproval" contracts.

- Facilitating the adoption of integrated resource planning procedures which allow nuclear projects to compete fairly with other resource options.

The first element of the strategy (milestone 10M1) reflects an assumption that rolling prudence procedures can reduce the large financial risks associated with "hindsight prudence" (i.e., regulatory disallowances based on after-the-fact, outcomes-oriented prudence reviews). It focuses on the adoption of regulatory policies affirming rolling prudence. 10M1 also focuses on the development of model planning procedures (10M1.4) which utilities can use as guidance in pro-

posing situation-specific procedures to implement some form of rolling prudence.

The second element (milestone 10M2) incorporates requirements involving construction work in progress (CWIP), and the need for flexibility to build nuclear units both within and outside of rate base regulation (e.g., as return-deregulated IPPs). This element assumes that regulators may be reluctant to approve nuclear projects which leave ratepayers exposed to open-ended financial risks (e.g., associated with construction overruns, O&M escalation, decommissioning, waste disposal); equally, that investors will be reluctant to participate without increased certainty concerning rate treatment.

This element seeks to adapt the concept of "preapproval contracting" to meet the needs of nuclear projects. It will develop generic risk-sharing mechanisms which will be adjusted and used to negotiate contracts in specific situations. This element will not specify standard contract terms; rather, it will develop (variable) mechanisms which can be adjusted/calibrated to specific circumstances. Mechanisms will be developed for two types of contracts: one involving traditional rate-based plants, the other for IPP-type projects. The mechanisms will specify the manner and timing of rate recovery for costs incurred at each stage of the plant's life cycle. They will incorporate performance-based incentives and will be designed to be consistent with policies reflecting full, partial, or no CWIP.

The third element (milestone 10M3) incorporates requirements involving the manner in which future capacity needs are established. It assumes that capacity needs will be established in an integrated resource planning (IRP) context, and that regulatory approval for the construction of a nuclear plant will be achieved only upon a showing that the project represents part of the "least-cost" resource mix. This element focuses on regulatory policies needed to ensure that planning is unbiased with respect to the evaluation of supply (including nuclear) resources. It will focus on the specification of model planning procedures that can be used by utilities to facilitate implementation of unbiased forms of IRP.

A fourth element would encompass activities associated with overall project management and review.

III. Milestones

10M1: Protocols regarding rolling prudence

10M1.1	Concept paper describing the attributes of "rolling prudence," identifying examples and discussing pros and cons of rolling prudence.	12/90
10M1.2	Discussion of the concept of rolling prudence with utilities and regulators.	12/90

10M1.3 Encouragement for the adoption of rolling prudence procedures by state regulatory commissions. 6/91

10M1.4 Development of a model rolling prudence procedure for use by utilities, and implementation assistance in a selected state or region. (Coordinate with model procedure for IRP (10M3.5). 3/92

10M2: Preapproval contracting

10M2.1 identification and development of preapproval contracting mechanisms which define the timing and rate treatment to be accorded costs incurred in all stages of the life cycle of the next-generation nuclear plant. This treatment will assume traditional utility ownership (i.e., a rate based asset), and will allow for full or partial CWIP. It will also incorporate performance-based incentive mechanisms, and will provide for explicit sharing of financial risks between ratepayers and shareholders. 12/91

10M2.2 Identification and development of preapproval contracting elements comparable to those developed in 10M2.1, but assuming nontraditional ownership (e.g., a project-financed IPP developed and owned by a limited partnership). 9/92

10M3: Protocols regarding integrated resource planning

10M3.1 Competitive analysis of next generation nuclear plant. This analysis will evaluate the expected benefit/cost characteristics of next generation nuclear technology in comparison to ratios typical of other competitive resource options (e.g., demand-side management projects, natural gas-fired plants). (NOTE: This task assumes inputs from Blocks 1 and 6 regarding engineering cost estimates for next generation nuclear plants). 9/91

10M3.2 Definition of integrated resource planning (IRP) policies and procedures which allow nuclear projects to compete on an equal basis with other resource options. 12/91

10M3.3 Discussion of desirable aspects of IRP procedures with utilities and with NARUC leadership. 3/92

10M3.4 Encouragement for adoption of desirable IRP procedures and/or policies. 9/92

10M3.5 Development of a model planning procedure on IRP. (Coordinate with model procedures for rolling prudence (10M1.4).) 3/93

10M4 Project management

10M4.1 Quarterly internal project review. Periodic briefing for NPOC on the status of Block 10 activities, addressing progress since the last briefing, and activities planned. 12/90

IV. Tie-Ins

10T1 To Block 2--Predictable licensing and stable regulation
Coordination with stable and predictable safety regulatory approach.

10T2 To Block 6--First-of-a-kind engineering
Engineering cost estimates to support competitive analysis.

10T3 To Block 7--Enhanced standardization beyond design
To enhance the assessment of financial risk.

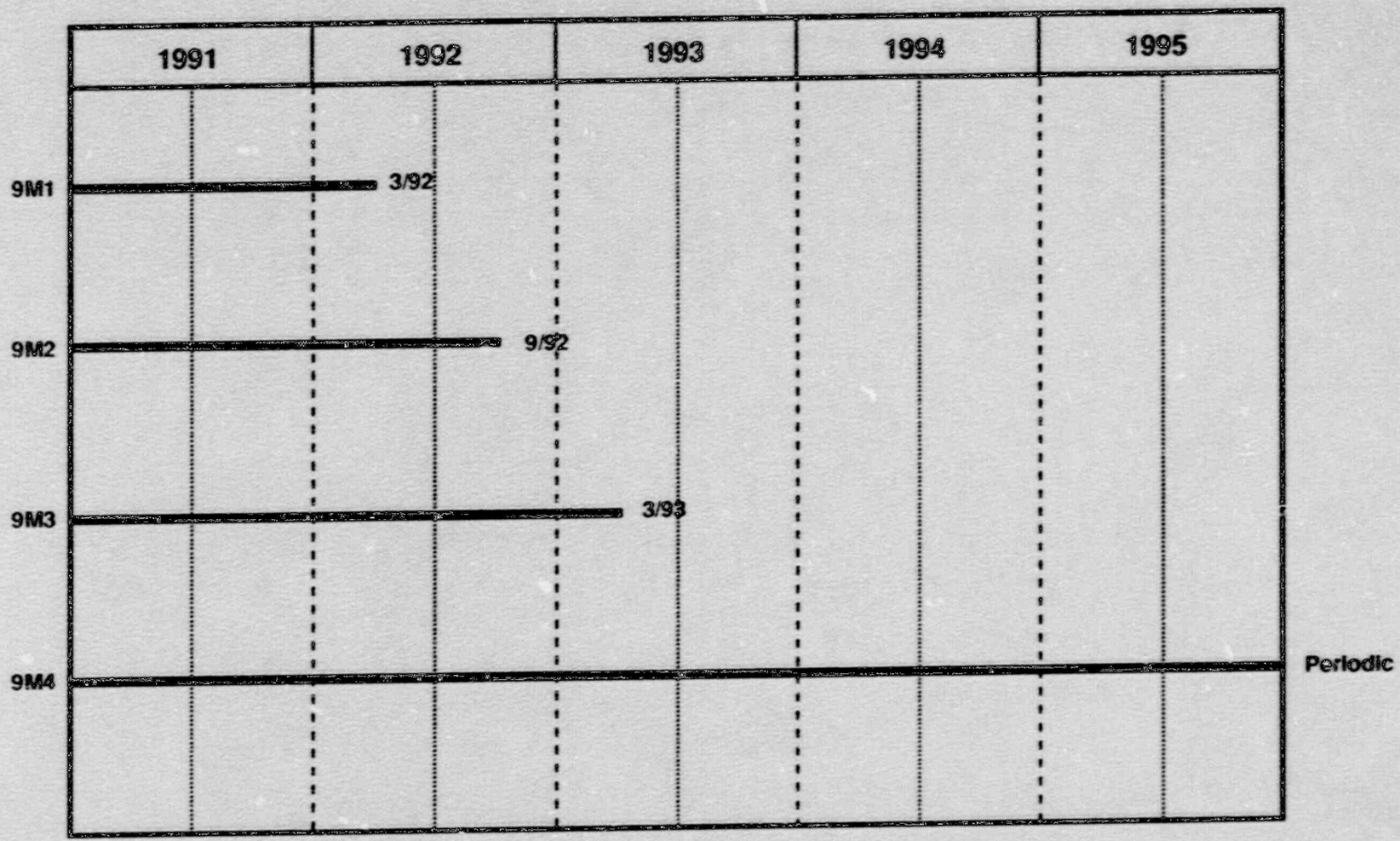
10T4 To Block 8--Enhanced public acceptance
To recognize the full benefits of nuclear energy.

10T5 To Block 9--Clarification of ownership and financing
To open up ownership and financing opportunities.

10T6 To Block 11--High-level radioactive waste
To increase investor/PUC confidence.

10T7 To Block 14--Enhanced governmental support
Coordination with legislative activities and governmental support.

Schedule Display for Block 10



ACTION PLAN FOR BUILDING BLOCK #11: HIGH-LEVEL RADIOACTIVE WASTE

I. Goals and Responsibilities

Goal:

Achieve progress with the high-level waste (spent fuel) disposal system that includes a permanent repository and a temporary monitored retrievable storage (MRS) facility.

Responsibilities:

Industry Lead	EEI-ACORD
Primary	DOE
Industry Supporting	UWASTE/USCEA/NUMARC/EPRI/ANEC
Regulatory	NRC/EPA/DOT/DOE

II. Summary Action Plan

Progress towards an operational high-level radioactive waste (spent fuel) disposal system is needed. The Nuclear Waste Policy Act (NWPA) of 1982, as amended, provides a Congressional mandate for the U.S. Department of Energy (DOE) to develop the high-level waste (spent fuel) disposal system. Progress towards developing a high-level waste disposal system is important if the nation is to have the confidence to make use of nuclear energy in the future.

For the purposes of this plan, progress towards an operational high-level waste disposal system is defined as a series of events within the overall high-level waste system development. It is important to recognize that the goal is to develop the high-level waste disposal system--not just the repository.

DOE must start site characterization work at the Yucca Mountain site in earnest. This requires settling the dispute with the State of Nevada. DOE should conduct the characterization effort in such a way as to identify early any disqualifying features. Environmental Protection Agency (EPA) standards must be finalized, along with implementing rules for the NRC requirements. DOE must proceed with sinking the exploratory shafts for underground examinations, because the question of suitability cannot be answered solely by surface-based testing. A stable DOE management structure for the waste program must be established, along with a qualified quality assurance program.

A site for a monitored retrievable storage (MRS) facility must be located by the Nuclear Waste Negotiator at a volunteer location, which requires the identification of potential sites, and the development of an effective benefits package and reasonable linkages to a repository.

The availability of expanded nuclear energy plant on-site storage must be assured, which requires continuing technology development and NRC licensing actions.

The milestones listed below are the responsibility of DOE except for 11M1, nuclear energy plant on-site spent fuel storage, which is an industry, DOE and NRC responsibility. Electric utility industry actions are directed to assisting DOE in achieving its milestones.

III. Milestones

11M1	Ensure continuing viability of nuclear energy plant on-site storage.		Ongoing
	11M1.1	Technology demonstrations.	Ongoing
	11M1.2	NRC licensing actions.	As needed
11M2	Reorganization of DOE Office of Civilian Radioactive Waste Management.		10/90
11M3	Management and operations (M&O) contractor established.		12/90
11M4	Complete the characterization of the Yucca Mountain site.		1/2001
	11M4.1	Finalize and implement a satisfactory quality assurance program.	3/91
	11M4.2	Gain access to initiate on-site characterization at Yucca Mountain.	1/92
	11M4.2.1	Resolve DOE-Nevada dispute for site access.	1/92
	11M4.3	Initiate construction of exploratory shaft.	11/92
	11M4.4	Determine as early as possible, the likely outcome of continued site characterization of the Yucca Mountain site.	1/95
11M5	Provide an MRS facility.		1/98
	11M5.1	Identify and negotiate an acceptable MRS site.	12/92
	11M5.2	Submit license application for MRS facility.	7/95
	11M5.3	Begin construction of an MRS facility.	1/97
	11M5.4	Begin limited operation of the MRS facility.	1/98
	11M5.5	Begin full operation of the MRS facility.	7/2000
11M6	If Yucca Mountain is found to be suitable for development as the nation's first high-level nuclear waste repository, begin licensing process.		10/97
	11M6.1	Yucca Mountain site recommended to the President for development as the nation's first nuclear waste geologic repository.	4/2001

11M6.2	Submit license application for Yucca Mountain repository.	10/2001
11M7	Start construction of repository at Yucca Mountain.	10/2004
11M8	Begin acceptance of spent fuel at repository.	1/2010

IV. Tie-Ins

11T1 To Block 1--Expanded nuclear energy plant on-site spent fuel storage will be needed in some instances.

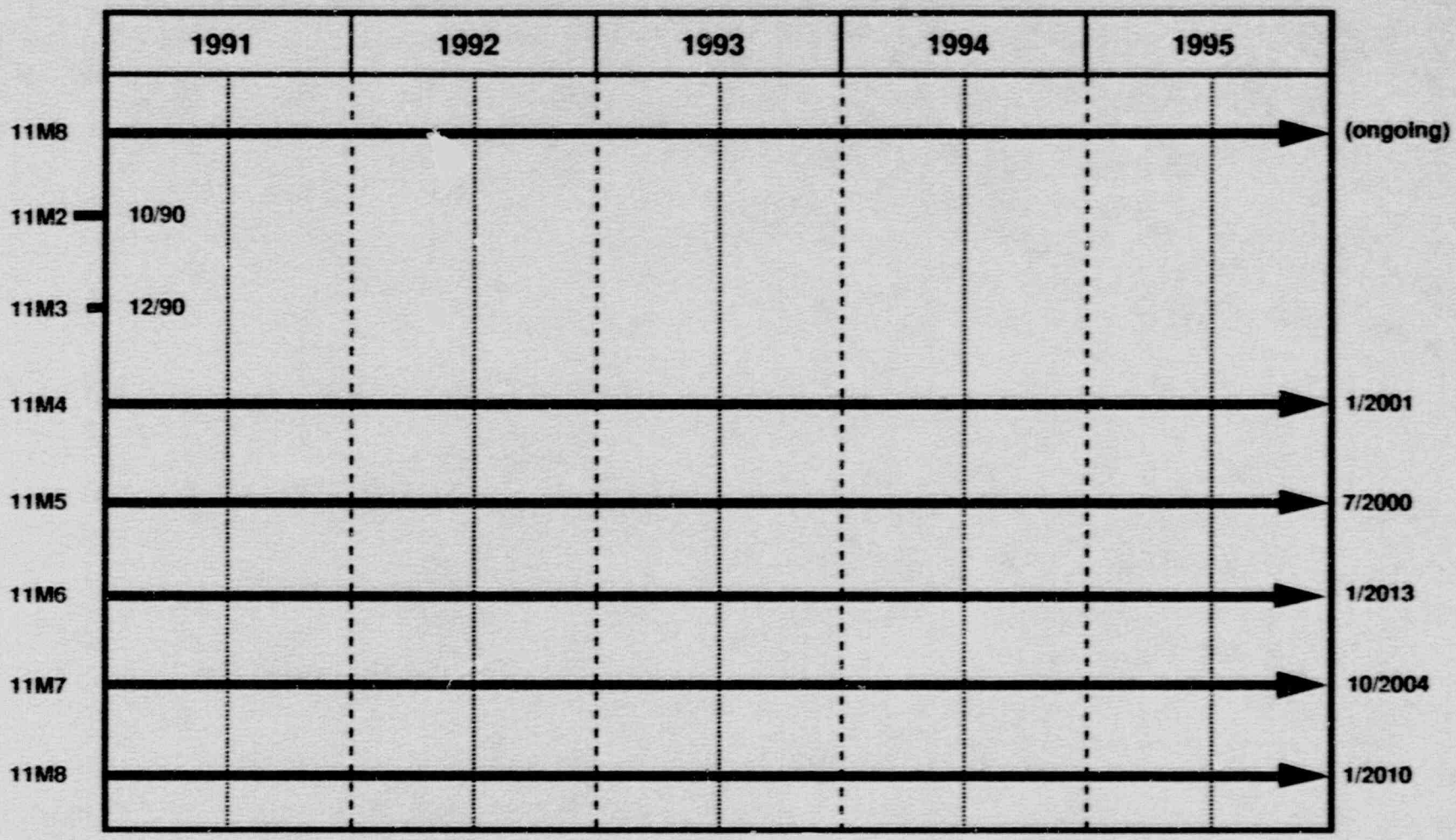
11T2 To Block 8--To enhance the nation's confidence that it can rely on nuclear energy, by achieving the progress in high-level radioactive waste management.

11T3 To Block 9--To enhance investor confidence in nuclear energy by achieving the progress in high-level radioactive waste management.

11T4 To Block 10--To enhance PUC confidence in nuclear energy by achieving the progress in high-level radioactive waste management.

11T5 To Block 14--To enhance governmental confidence in nuclear energy by achieving the progress in high-level radioactive waste management.

Schedule Display for Block 11



ACTION PLAN FOR BUILDING BLOCK #12: LOW-LEVEL RADIOACTIVE WASTE

I. Goals and Responsibilities

Goal:

Assure availability of low-level nuclear plant waste disposal capacity.

Responsibilities:

Industry Lead	EEI-ACCORD
Primary	States
Industry Supporting	UWASTE/USCEA/ANEC/NUMARC/EPRI
Regulatory	NRC/EPA

II. Summary Action Plan

The Low-Level Waste Act and Amendments provide that the states are primarily responsible for the development of new disposal capacity. The states have formed nine regional compacts; four states will "go it alone." Thirteen new disposal sites are being developed. These states and compacts are in the process of identifying sites and preparing license applications. Applications will generally be submitted by January 1, 1992, and the sites are expected to start operating in the 1993 to 1995 time frame.

The milestones shown in Section III are the responsibility of the states, NRC and DOE. Electric utility industry actions are directed at assisting the states and the federal agencies in achieving their milestones. Industry involvement will be to monitor site development, become involved in appropriate rulemakings, and provide useful supporting information. Individual utilities, depending upon their unique circumstances, may become involved in developing the facilities.

III. Milestones

12M1	Opening of new state and compact low-level waste disposal sites.		
	12M1.1	DOE issues mixed waste disposal facility strategic plan.	7/90
	12M1.2	DOE Annual Report on siting activities.	6/91 & 6/92
	12M1.3	EPA and NRC develop mixed waste guidance.	12/92
	12M1.4	States and compacts submit license applications.	12/92
	12M1.5	NRC or states determine if license applications are complete.	2/92
	12M1.6	Barnwell and Beatty sites scheduled to close.	1/93

12M1.7	States must dispose of waste, or else surcharges are returned to generators.	1/93
12M1.8	DOE refunds surcharges pursuant to 1/1/93 date.	2/93
12M1.9	NRC acts on license applications received.	4/93
12M1.10	States operate disposal facilities, or else take title, possession, and liability for waste.	1/96

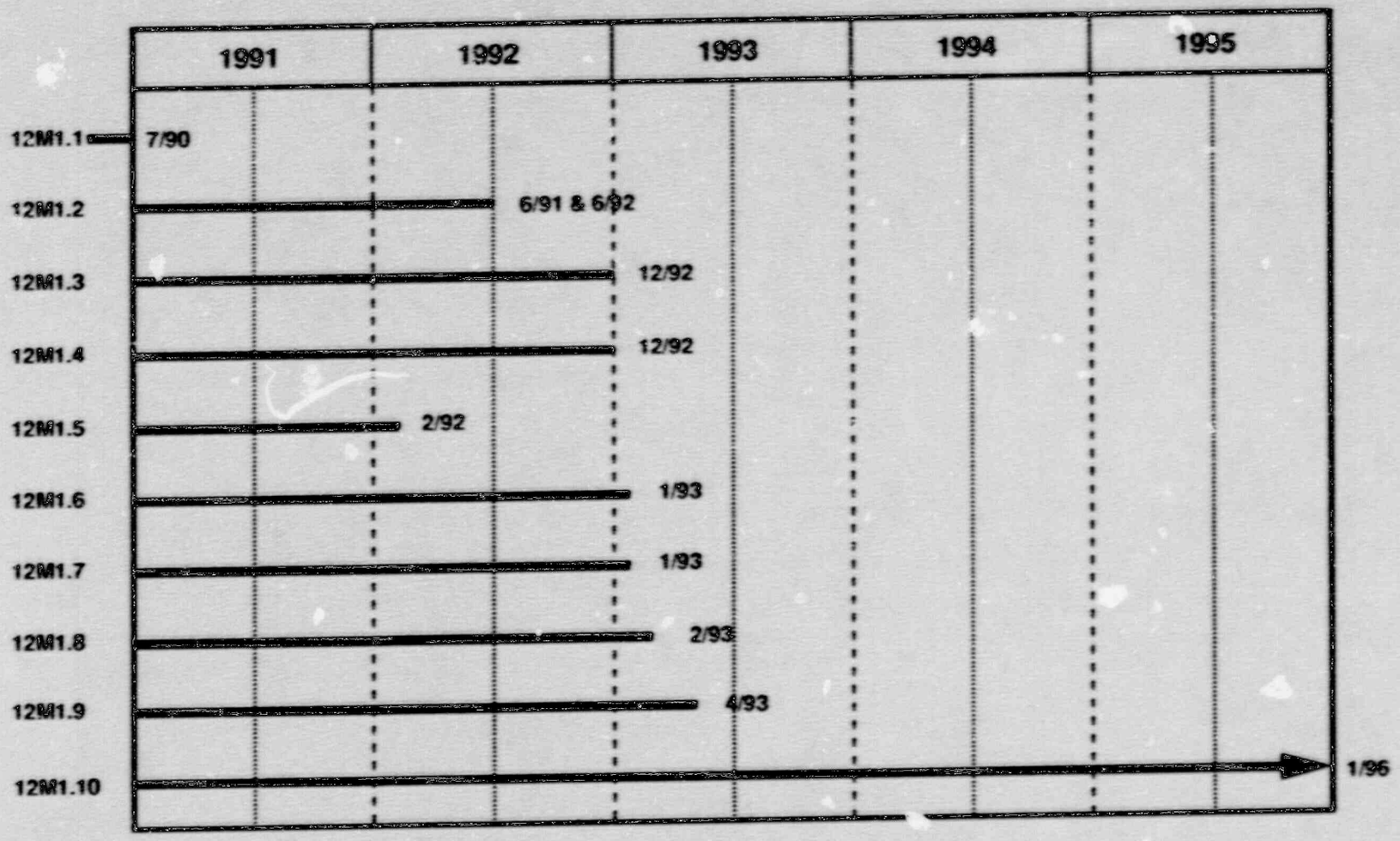
IV. Tie-Ins

12T1 To Block 1--To promote continued safe nuclear plant operation to ensure minimization of low-level waste volumes.

12T2 To Block 8--To enhance the nation's confidence that it can rely on nuclear energy by communicating the progress in low-level radioactive waste management.

12T3 To Block 14--To enhance governmental confidence in nuclear energy by achieving the progress in low-level radioactive waste management.

Schedule Display for Block 12



ACTION PLAN FOR BUILDING BLOCK #13: ADEQUATE, ECONOMIC FUEL SUPPLY

I. Goals and Responsibilities

Goal:

Assure a continuing stable and economic supply of nuclear fuel.

Responsibilities:

Industry Lead	EEI
Primary	DOE/Private Sector Uranium and Uranium Enrichment
Suppliers/Converters/Utilities	
Industry Supporting	ANEC/USCEA
Regulatory	NRC

II. Summary Action Plan

The action plan pertaining to adequate, economic fuel supply for new nuclear energy plants will be directed toward maintaining the open free market conditions for uranium and enrichment that our industry has achieved to date, while at the same time working to achieve improvements in domestic enrichment supply and additional flexibility for utilities in all aspects of the fuel cycle.

Significant progress has been made in the predictability of supply of nuclear fuel since private ownership of uranium was first authorized. There was concern about the availability and price of enriched uranium fuel, and a critical step in the nuclear fuel preparation process, enrichment, was classified and only available from the federal government.

Today, low-priced uranium is readily available on the spot market, multiple suppliers with substantial capacity of enrichment services provide competition for the electric utilities' business, and large reserves of uranium, mostly in Canada, appear to be available at a reasonable price.

As new reactor orders again begin to be placed, the challenge for the industry in the fuel supply area will be to assure that economical production capacity will be added to satisfy the increased demand for nuclear fuel. Historically, predicted demand for nuclear fuel that did not materialize caused major price swings and resulted in long-term contracts with prices quite different from those of the current market. Plentiful supplies of both uranium and enrichment have stabilized the market, but this has been a source of considerable debate regarding the need for legislative protection for both the U.S. uranium miners and for the DOE uranium enrichment enterprise.

Currently our industry is seeking improvements for the DOE Uranium Enrichment Enterprise to assure that it will operate in a competitive manner.

We will continue to encourage private sector initiatives to construct and offer enrichment services. A diversity of supply will help stabilize the enrichment market and provide maximum flexibility and efficiency in a maturing fuel market.

III. Milestones

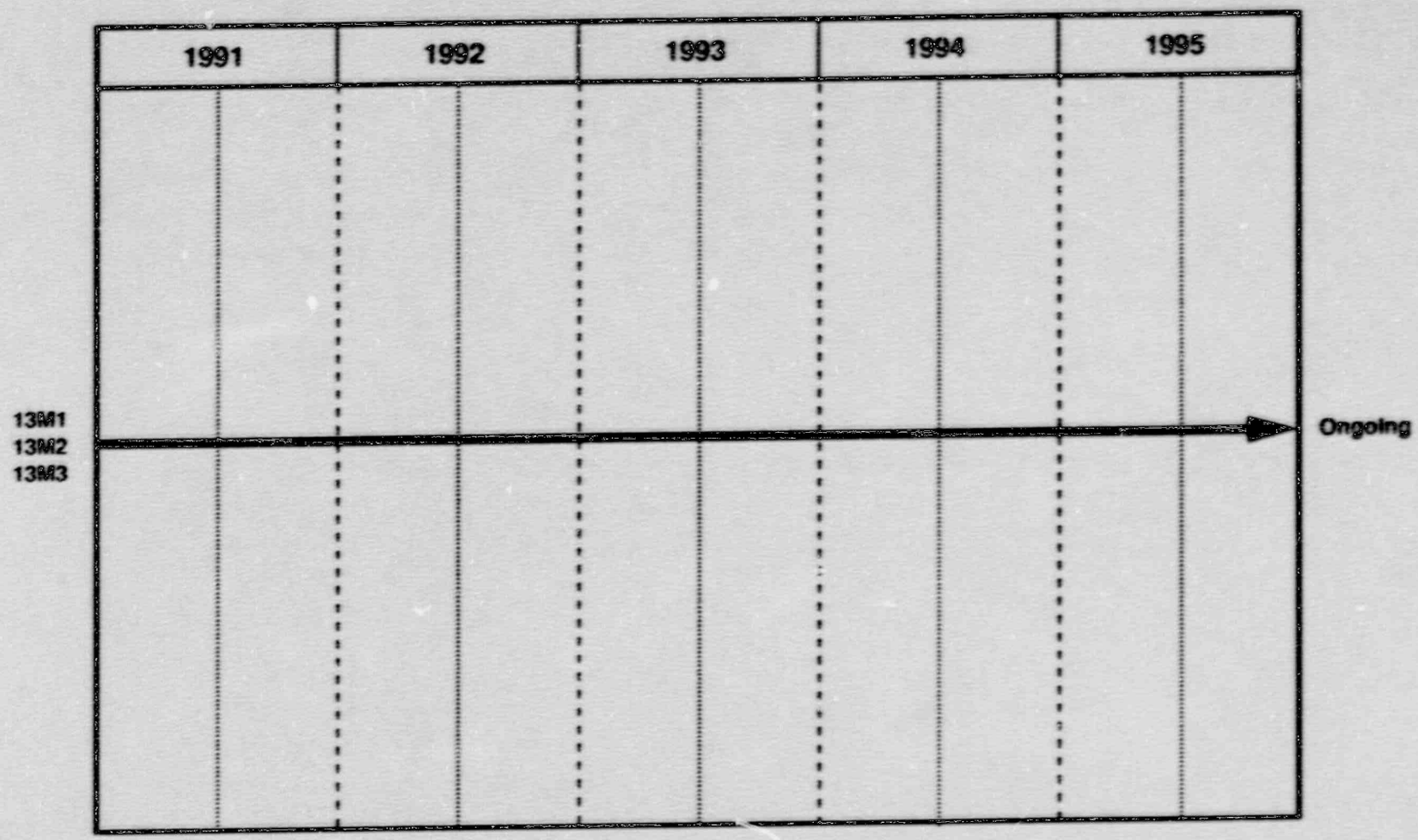
13M1	Continue dependable, economical, and reliable nuclear fuel supply by maintaining unrestricted access to uranium supply, conversion and enrichment services, and fuel fabrication on an internationally competitive basis.	Ongoing
13M2	Seek passage of equitable legislation to make the U.S. DOE uranium enrichment enterprise a separate corporation.	Ongoing
13M3	Improve the availability of domestic enrichment services at competitive prices by encouraging private enrichment in the United States	Ongoing
13M3.1	Support legislation that would authorize NRC to license a private enrichment facility under the current 10 CFR Part 70.	12/90 or 102nd Congress

IV. Tie-Ins

13T1 To Blocks 9 and 14--During activities to complete verification of ownership and financing, an assessment of the adequacy of economic nuclear fuel will be an important part of the final decision to go forward with the reactor order.

13T2 To Blocks 8, 10, and 14--To gain support for predictable fuel supply.

Schedule Display for Block 13



ACTION PLAN FOR BUILDING BLOCK #14: ENHANCED GOVERNMENTAL SUPPORT

I. Goals and Responsibilities

Goal:

Enhance governmental support for the necessary institutional framework, including laws, regulations and programs, that encourage the construction and operation of new nuclear plants.

Responsibilities:

Industry Lead	ANEC
Primary	Congress/States/DOE
Industry Supporting	EEI/APPA/USCEA/NUMARC/ U.S. Industry

II. Summary Action Plan

a. Enhance governmental support of nuclear energy with Congress by disseminating information on utility progress on operating performance; promote understanding of radiation, safety and waste issues with federal and state government officials.

b. Encourage a strong recognition of nuclear energy's role included in the National Energy Strategy.

c. Encourage adequate Congressional appropriations for DOE and NRC activities in support of advanced reactor programs needed to implement the Strategic Plan.

d. Secure passage of favorable legislation in support of advanced reactors R&D program.

e. Secure Congressional enactment of legislation to codify and strengthen NRC's combined licensing process.

f. Clarify regulatory authorities and responsibilities among NRC, EPA, and states on safety and environmental issues.

g. Encourage state rate reform to provide adequate and predictable rate of return for nuclear power plant projects.

h. Seek passage of legislation to restructure the DOE uranium enrichment enterprise (UEE) to operate in a more business-like manner in order to provide competitively priced uranium enrichment services.

i. Encourage progress on the high-level waste disposal system.

III. Milestones

14M1	Provide periodic progress reports on performance by utilities to Congress.	Ongoing
14M2	National Energy Strategy.	Ongoing
14M3	DOE and NRC budget and appropriations.	Ongoing
14M4	Advanced Reactor R&D legislation.	Ongoing
14M5	Congressional enactment of legislation to codify and strengthen NRC's combined licensing process.	Ongoing
14M6	Clarify regulatory responsibilities among NRC, EPA, and states.	Ongoing
14M7	Obtain state legislation to assure adequate economic return for nuclear energy projects.	Ongoing
14M8	Passage of Uranium Enrichment Enterprise (UEE) restructuring legislation.	Ongoing
14M9	Obtain necessary legislation to assure continued progress on high-level radioactive waste facilities and achieve enhanced acceptance within the State of Nevada.	Ongoing
14M10	Low-level radioactive waste issues.	Ongoing

IV. Tie-Ins

14T1 From Block 1--Provide progress reports on performance improvements.

14T2 To Block 2--Achieve legislation reinforcement of predictable licensing.

14T3 To Block 4--Encourage adequate appropriations legislation for certification activities.

14T4 To Block 5--Assure continuing support of the siting program by DOE and Congress.

14T5 To Block 6--Encourage continuing Congressional support for first-of-a-kind engineering.

14T6 From Block 8--Assist and support efforts to enhance public acceptance.

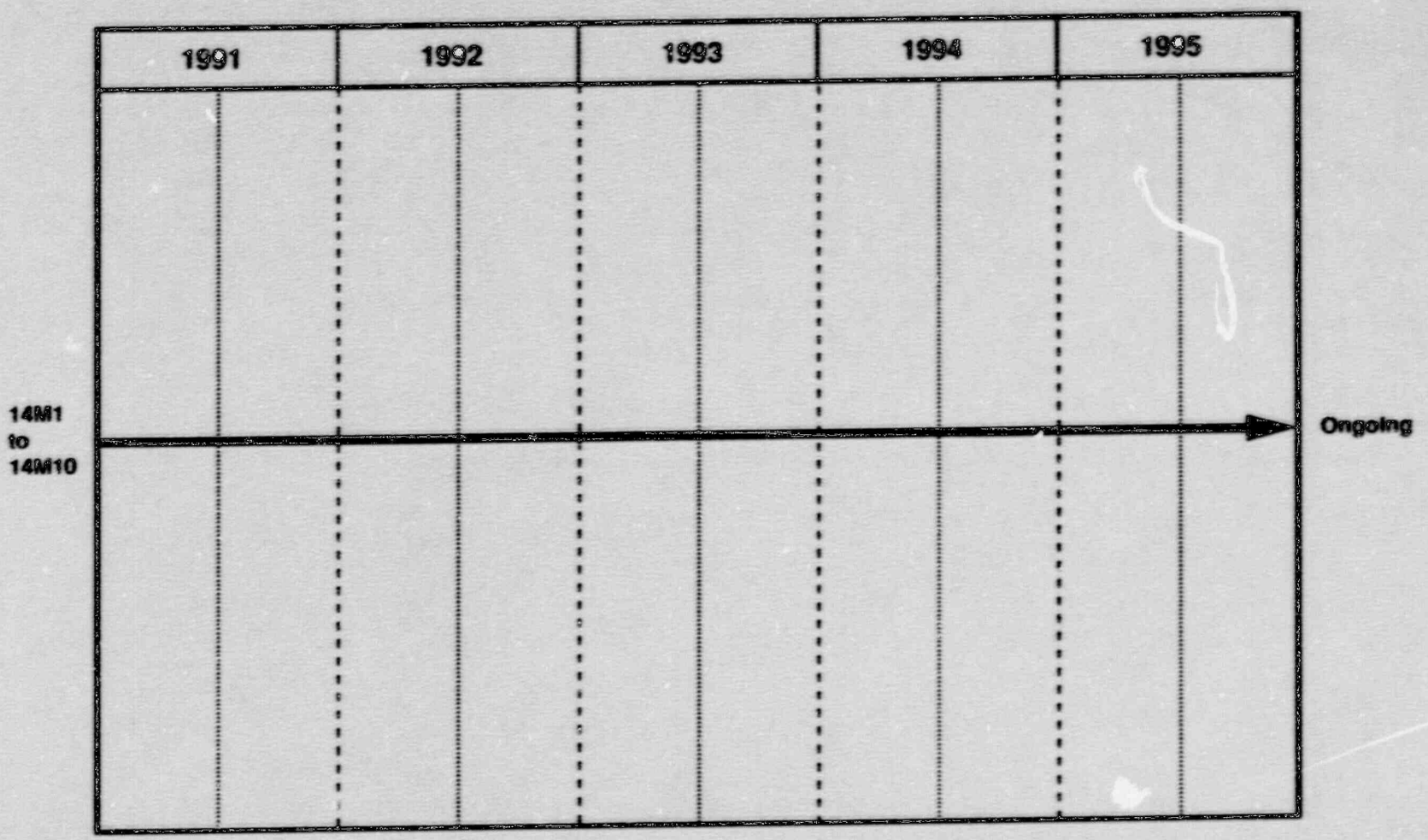
14T7 To Block 10--Enhance confidence in the financial prudence review through state rate reform legislation.

14T8 To Block 11--Achieve enhanced acceptance of the HLW program in Nevada.

14T9 To Block 12--Monitor and coordinate Congressional activities for favorable resolution of LLW issues.

14T10 To Block 13--Secure passage of Uranium Enrichment Enterprise (UEE) restructuring legislation.

Schedule Display for Block 14



APPENDIX A

GLOSSARY

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ABWR	Advanced Boiling Water Reactor (GE evolutionary design)
ACRS	Advisory Committee on Reactor Safeguards (part of NRC)
AE	Architect-Engineer
ALWR	Advanced Light Water Reactor
AP 600	Advanced Passive 600 (Westinghouse passive design)
APWR	Advanced Pressurized Water Reactor
BWR	Boiling Water Reactor
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
COL	Combined Operating License
COO	Chief Operating Officer
CWIP	Construction Work in Progress
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FDA	Final Design Approval
FEMA	U.S. Federal Emergency Management Agency
FERC	U.S. Federal Energy Regulatory Commission
FOAK	First-of-a-Kind (Engineering)
FSAR	Final Safety Analysis Report
HLW	High-Level Waste
IPP	Independent Power Producer
IRP	Integrated Resource Planning
ISI	In-Service Inspection
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
LLW	Low-Level Waste
LWR	Light Water Reactor
MRS	Monitored Retrievable Storage
MWe	Megawatt (electric)
NEPA	National Environmental Policy Act
NES	National Energy Strategy (prepared by DOE)

NRC	U.S. Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NWPA	Nuclear Waste Policy Act
O&M	Operations and Maintenance
PRA	Probabilistic Risk Assessment
PSC	Public Service Commission
PUC	Public Utility Commission
PWR	Pressurized Water Reactor
QA	Quality Assurance
RCS	Reactor Coolant System
RFQ	Request for Quotation
SBWR	Simplified Boiling Water Reactor (GE passive design)
SEC	U.S. Securities and Exchange Commission
SECY	NRC Staff Document to NRC Commissioners
SEE-IN	Significant Event Evaluation and Information Network
SER	Safety Evaluation Report
SSAR	Standard Safety Analysis Report
System 80+	Combustion Engineering evolutionary design
TMI	Three Mile Island
UEE	Uranium Enrichment Enterprise

APPENDIX B

IDENTIFICATION OF INDUSTRY ORGANIZATIONS

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NPOC	Nuclear Power Oversight Committee

NPOC is composed of senior executives representing the following utility organizations, plus at-large representatives of reactor supplier, architect-engineer, and utility companies:

ANEC	American Nuclear Energy Council
APPA	American Public Power Association
EEI	Edison Electric Institute
EPRI	Electric Power Research Institute
INPO	Institute of Nuclear Power Operations
NRECA	National Rural Electric Cooperative Association
NUMARC	Nuclear Management and Resources Council
USCEA	The U. S. Council for Energy Awareness

Other industry organizations or committees referred to in the NPOC Strategic Plan:

ACORD	American Committee on Radwaste Disposal (subcommittee to NPOC, staff support by EEI)
SOWG	Standardization Oversight Working Group (oversees NUMARC activities on standardization)
USC	Utility Steering Committee (oversees EPRI ALWR Program)
UWASTE	Utility Nuclear Waste and Transportation Program (administered by EEI)
WANO	World Association of Nuclear Operators