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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, November 1, 1989

The Commission met in open session, pursuant to notice, at 2:30 p.m., Thomas M. Roberts, Commissioner, presiding.

COMMISSIONERS PRESENT:

THOMAS M. ROBERTS, Commissioner
KENNETH C. ROGERS, Commissioner
JAMES R. CURTISS, Commissioner

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

CARLO CASO, General Manager, Nuclear and Advanced Technology Division, Westinghouse

BRIAN McINTYRE, Manager, Advanced Plant Safety and Licensing, Westinghouse

BILL JOHNSON, Manager, Nuclear Safety Department, Westinghouse

BOB WIESEMANN, Manager, Regulatory and Legislative Affairs, Westinghouse

P-R-O-C-E-E-D-I-N-G-S

2:31 a.m.

COMMISSIONER ROBERTS: Good afternoon, ladies and gentlemen. This is our third meeting of the day, hearing from vendors about advanced light water reactors. We're happy today to welcome this afternoon Westinghouse.

Let me quickly say, Chairman Carr is involved in an exercise that involves simulated event and he wants me to assure you that his absence in no way reflects his lack of interest in your presentation and he -- the staff is well represented and he will review the transcript.

Any opening remarks?

Please proceed.

MR. CASO: (Slide) Thank you very much and good afternoon. I'm Carlo Caso, the General Manager of the Nuclear and Advanced Technology Division of Westinghouse Electric Corporation. On my right is Bob Wiesemann, who is the Manager of Regulatory and Legislative Affairs, and on my left is Bill Johnson, Manager of Nuclear Safety and farther to the left is Mr. Brian McIntyre, who is the Manager of Advanced Plant Safety and Licensing Design.

I have the responsibility within

Westinghouse for developing and licensing the technology for the new evolutionary and advanced plants for tomorrow as well for plants operating today. I'm here to describe to you as well the Westinghouse advanced plant program with an emphasis on the SP/90, which is our evolutionary design, that is currently under NRC review. The other model, the 600 megawatt passive plant, the AP600 as we call it, will be discussed only insofar as the AP600 design certification program overlaps the SP/90 program.

I will also discuss our view on the role of the EPRI utility requirements document and the impact of this document on the licensing process, both for the evolutionary and the passive plant. Also, very importantly, I will discuss where we believe the staff should place their emphasis.

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The return of the nuclear power market in the United States requires predictability in the licensing process. The vendor needs certainties that the plant he designs will be licensable or no utility will buy it. The design certification process provides certainty for the vendor by having the NRC review and approve the plant design prior to construction.

The utility needs certainty that the plant will be allowed to operate once construction is complete. The recently issued standardization rule is a significant step toward providing the required predictability by authorizing early site permits, standard design approvals, and combined construction operating licensing for essentially complete power plant design. There is, of course, still the need to eliminate the opportunity of a hearing prior to operation that has been and is being debated in this and other arenas.

The NRC needs certainty that the plant, as constructed, will be safe to operate. The new Part 52 provides this certainty by requiring a set of inspection, test, analyses and acceptance criteria to be submitted, reviewed and approved as part of the certified design and the COL. Performing the tests, inspections and analyses and meeting the acceptance criteria provides assurance that the plant, which incorporates the certified design, has been built and will operate in accordance with the design certification and the COL.

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The Electric Power Research Institute, with the associated Utility Steering Committee, is

currently developing a comprehensive set of technical design requirements for advanced light water reactors. These design requirements are in the form of a requirements document which defines the technical basis for improved and standardized future light water reactor designs. The ALWR requirements are essentially a consensus of the industry as to which feature should be sought in the next generation of nuclear plants.

In addition to identify design needs, this program will provide a stabilized regulatory basis for future LWRs by resolving outstanding licensing issues, defining any necessary change to regulatory requirement and specifying guidelines for design which provide acceptable severe accident prevention and mitigation.

The requirements document for the evolutionary plant is near completion and is being reviewed by the NRC. Completion of the staff review and issuance of a safety evaluation report will provide certainty that the needs of the power generation industry and the regulatory authorities are compatible.

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I would like to focus for a few minutes on

where the staff needs to place an emphasis. While the industry is moving toward certification of several reactor designs, there are several issues that the staff needs to complete to actually implement the new Part 52. The first item clearly in our mind relates to the inspections, tests, analyses and acceptance criteria.

Determining in advance the acceptance criteria and related tests, inspections and analysis has never been required or accomplished before. Substantial efforts are underway by NUMARC to develop what will be required.

A matching effort will be needed by the NRC regulatory staff to review the industry proposal so that agreement can be reached on how to detail the ITAAC. This matter is critical to the effort to eliminate a hearing at the post-construction, pre-operational stage. If the ITAAC cannot properly detail as part of the design certification or COL process, an amendment to the COL would be needed and such an amendment would require an opportunity for hearing.

The next issue is a need to resolve environmental impact issues. The court decision in a recent Limerick case means that the NRC must consider

design alternatives in connection with the NRC consideration of environmental matters under NEPA, even if these design alternatives do not need to be considered under the Atomic Energy Act. The intent of Part 52 was to preclude design considerations after a design has been certified. In light of the Limerick case, it will be necessary to consider environmental impact of the design certification stage in order to accomplish this intent. However, as presently written, the NRC does not require this. Thus, as presently written, the NEPA review at the COL stage could lead to design changes, even though the plant has a certified design approval.

This matter is currently being discussed by industry lawyers with the NRC staff lawyers in the context of the litigation challenge in Part 52 which has been brought by the environmentalists.

The third item is the need to work out emergency plan revisions. Part 52 complicates emergency planning. The rule requires either certification of an emergency plan from a state or an adequate utility plan, even though the certifications are not binding on a state and may be rescinded by a new state administration. The requirement for certification is an unnecessary new requirement.

Due to the requirement of an emergency plan exercise prior to operation and the court-imposed requirement that there must be a hearing on the exercise, the way is open for a post-construction, pre-operational hearing on emergency planning, the very thing that helped bring down Shoreham and threatens Seabrook. There is language in the court case that suggests that if the NRC had criteria for accepting emergency plans and judging their adequacy, such a hearing may not be needed. Changes are needed in the NRC regulations on emergency planning, or in Part 52, to allow for the use of ITAAC in connection with emergency plans and to eliminate language now interpreted to require a hearing on the emergency planning exercise.

In addition to these items, there are a number of other issues, such as how to consolidate contentions, how to handle proprietary information, definition of the former content of the application and the rule that need to be resolved in the design certification rulemaking and the NRC should address these items.

Finally, Part 52 requires the standard design certification to set forth the interface requirements to be met by those portions of the plant

for which the application does not seek certification. Part 52 also requires that an application for a COL referencing a certified design demonstrate compliance with such interface requirements. NRC regulatory guidance is needed on what will be required for the interface requirement and what will be necessary to demonstrate that the interface requirement has been satisfactorily met.

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The EPRI utility requirements document for evolutionary plants is now being reviewed by the staff. Methods for resolving a number of generic issues, including severe accidents, can best be developed through review of the requirements document. Completing the safety evaluation report on the evolutionary utility requirements document in the very near future will smooth the design certification process by providing a standard approach to resolving the generic issues facing the industry. Additionally, the review and safety evaluation report for the evolutionary requirements document will provide insight for the development of the passive plant requirements document.

Emphasis should be placed on those plants that support the major trends in the market so as to

have available certified designs of the type desired in the market place by the time plants are needed. We believe the market will require such reviews to be completed no later than the mid-'90s. It will be possible to complete these reviews and the certification of passive plants within that time, provided that the NRC puts resources in this area. Since we believe passive plants are what the domestic market will want, the emphasis should be placed on review of the passive plants.

The work accomplished to date on evolutionary plant design needs to be captured and preserved to avoid wasting the effort expended to date and to provide support for U.S. vendors in the international market.

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From a Westinghouse perspective, we believe that the design programs for evolutionary plants are well in hand. The plant models are either in the preliminary or final design stages. Standard design approvals, either PDAs or FDAs, have either been issued or are expected to be issued in the very near future.

Of course, the evolutionary plant design certification, when needed, will be subject to

resolution of the Part 52 implementation aspects and of the generic technical issues which we plan to address through the EPRI utility requirements document.

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The passive plant programs, the AP600, have been through the conceptual design process and the final design is on an accelerated schedule. We consider it essential to address all technical issues related to the plant design as early as possible in the design program so that the resolution can be engineered into the design rather than added on. The licensing review basis document, to be prepared in mid-'90, will serve this purpose.

We believe that there will be a market for the passive plant in the United States within the next ten years, and this view is supported by the recent Department of Energy awards for design certification to be completed by the end of 1994.

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A timely review of the EPRI evolutionary plant requirements document and a speedy issuance of the SER will benefit both the evolutionary and the passive plant programs through the resolution of generic issues and common requirements. This will lay

the groundwork for the staff review of the passive plant requirements document which is expected to begin in mid-1990. By establishing these methods of resolution and requirements now, they can be engineered into plant designs rather than added at a later date.

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Westinghouse has two plants in our standardization program. The first is a 1300 megawatt evolutionary design, the RESAR SP/90, that has been under NRC review since 1983. It was designed and submitted for review prior to the EPRI utility requirements document. In fact, many of the items in the utility requirements were developed from features in the SP/90. For issues such as severe accident that have developed since the SP/90 was submitted for review, Westinghouse intends to meet the EPRI utility requirements document.

The NRC review has progressed to the point that we believe the preliminary design approval can be issued to Westinghouse in April of 1990. I will talk more about the PDA and the SP/90 in a few minutes.

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The first module of the SP/90 Reference Safety Analysis Report was submitted for NRC review in

1983. Since that time, we have submitted the remaining safety analysis report modules, including two PRA modules in 1987. We have since responded to a number of requests for additional information and have updated the RESAR in response to staff comments. We have met with the ACRS subcommittee five times and we will meet with them again the day after tomorrow to discuss open issues. We have made one presentation to the full ACRS and in December 1987 we briefed you on the design features of the SP/90. The NRC has issued three draft safety evaluation reports.

We believe that with few exceptions all technical issues related to the SP/90 design have been resolved and that we are in a position to receive the PDA for the SP/90 in April of 1990 using the process that I will describe later.

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The second plant in the Westinghouse standardization program is a 600 megawatt passive design, the AP600, that is being co-funded by the Department of Energy. The conceptual design for this plant is complete and the final design effort will commence on January 1, 1990. The final design of this plant will be developed in concert with the EPRI utility requirements for passive plants.

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This schedule reflects the overlap of the remaining SP/90 PDA effort with the program we have committed to as part of our AP600 DOE contract.

The first AP600 submittal the NRC will receive from us will be the licensing review basis document in mid-1990. We expect the LRB to be approved by October 1990. It is imperative that the LRB be approved early in the program to establish the basis of subsequent design and safety analysis efforts.

The Standard Safety Analysis Report, ITAAC and PRA reports will be submitted in mid-1992.

We feel that the successful conclusion of the SP/90 review early in 1990 will make available necessary staff resources for the work to be accomplished on the AP600. The AP600 final design approval is targeted for the end of 1993 and the design certification for the end of 1994.

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The SP/90 intermediate design is complete. The SP/90 was developed as a part of a contract that included over $150 million in development costs shared by five Japanese utilities, the Japanese government, the MITI organization, Mitsubishi Heavy Industries and

Westinghouse. The design work for a total plant, including verification testing of major components, was completed as of March 1987. Since the SP/90 design was considered when the EPRI evolutionary plant requirements document was developed, the SP/90 meets most of the requirements, such as the items listed on the overhead. Specifically, increased margins, dedicated safety systems, use of PRA and reduced dependence on operator actions.

The SP/90 is an evolutionary plant that builds directly on present day plant design, with enhancements in safety, improvements in plant performance and reduced generating costs. No additional development efforts are required. We believe that the primary market for large evolutionary plants like the SP/90 will be in the international arena.

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We have received three draft safety evaluation reports on the SP/90. We expect the draft SER on the PRA next month. We have responded to requests for additional information on the PRA and have met with the staff and their contractor to discuss the PRA results.

It is anticipated that no additional major

items will be identified in the PRA draft SER beyond the severe accident issues already known. The only remaining draft SER is our approach to the unresolved safety issues and generic safety issues. At this time, we expect to receive that report early in 1990.

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There have been a total of 107 open issues in the three draft SERs that we have received to date. Of these, we consider that we have closed 87 by either revising the safety analysis report or providing additional clarifying information. That leaves 20 issues remaining. These can be categorized as requiring additional effort to resolve, use of new methodologies not yet reviewed by the staff and issues where the NRC review is not complete. A selected few of the severe accident issues that have not been resolved fall into this group.

This is a sufficiently small number of open issues to give us confidence that we will be able to resolve them without serious disruption. Based on what we know, we do not expect a large number of additional open issues from either the backend PRA or USI/GSI draft SERs.

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We were asked by the staff to provide our

perspective of a preliminary design approval. Given the changes that have occurred in standard plant licensing since we originally applied for the SP/90 PDA in 1983, the staff questions what value it would have. After some careful thought, we came up with four items that we believe a PDA addresses.

First, it documents the review that has been completed and is specific about what needs to be completed to receive the final design approval. In the case of the SP/90, considerable effort has been expended in getting this far. Westinghouse has spent over 400 man months. Without formalizing what has been done so far, we will have to spend considerable duplicate time and effort for the FDA.

The PDA also provides us with a preliminary evaluation by the staff of the SP/90 safety analysis and design features.

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In the severe accident area, the EPRI utility requirements document is still being reviewed by the staff. We believe that the best approach is for us to wait until the EPRI utility requirements document SER is issued and take advantage of the effort and insight that is provided for the SP/90.

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We also see four benefits to issuing the PDA. As mentioned previously, two of the benefits are the preservation of the effort we have both expended in the SP/90 review and the formalization of those items which have been agreed on.

Additional benefits are: the PDA supports the present market for large evolutionary plants in the international arena. Evidence of licensibility of design in the country of origin is essential in the international market. We plan to reference the PDA and seek country-specific solutions to the open issues for opportunities offshore.

Finally, the successful completion of the SP/90 PDA will make available additional resources, both on the part of the staff as well as Westinghouse, to work on the procedures and processes necessary to implement Part 52 and to proceed with the design and certification effort for the smaller passive designs.

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We believe it is practical to have the SP/90 PDA issued by April 1990. The necessary ACRS reviews can be completed by that time. We believe that no more than two subcommittee meetings should be required and one of those is scheduled for the day after tomorrow. One full committee meeting should be able

to be held by March. We are meeting with the staff tomorrow to discuss our approach to the open items and completing the RESAR review.

The few severe accident issues that are still not resolved, in particular the need for containment venting, would be deferred until the FDA application. By that time, the EPRI utility requirements document SER will be issued and we can take advantage of the effort expended in developing industry-wide standard approaches to the severe accident issues.

In the draft SER, the open issues which cannot be resolved on a timely basis should also be addressed at the FDA stage. There is no benefit that we can see to closing each of these issues at the PDA stage.

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In the longer term, we would like to be able to incorporate the benefit of the EPRI utility requirements document in the FDA application. The SP/90 was submitted for review prior to the EPRI documents being developed. While many of the SP/90 features have been incorporated into the document, there may be features in the final document that receives the SER that are worthwhile going back to

incorporate in the final SP/90 design.

We will submit the SP/90 for a final design approval when we believe the market conditions are appropriate.

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In summary, the standardization of nuclear plant design is necessary for the return of the nuclear options in the United States. The new 10 CFR Part 52 has features required to put standardization into practice, although certain changes are needed. In addition, significant effort is required to implement Part 52. We believe that developing the implementation processes should be given a top priority by the staff.

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Westinghouse has standard design programs that are responsive to what we see that market needing over the next decade. The SP/90 meets the need for large plants, which we see as being offshore. We believe that the SP/90 PDA review should be wrapped up by April 1990. For the domestic market, the AP600 provides a plant responsive to utility needs, targeted for certification by 1994.

We fully support the ongoing development of the EPRI ALWR utility requirements document as it

impacts both the evolutionary and passive plant designs.

We believe that the EPRI utility requirements document is the appropriate vehicle to develop resolution between the utilities, designers and regulators of generic issues, such as severe accidents, facing the industry today. As such, we urge the staff to place an emphasis on completing the SER on the evolutionary plant document and to review the passive plant document in a timely manner.

I appreciate this opportunity to provide the Westinghouse viewpoint on advanced plant directions and would be pleased to respond to any questions you may have.

COMMISSIONER ROBERTS: Ken?

COMMISSIONER ROGERS: Are you in a position to provide any data on core damage frequency and conditional containment failure probabilities on the SP/90?

MR. CASO: The analysis that was done did result in evaluation of the core frequency and releases from the SP/90 which are in excess or smaller than the requirements specified by the EPRI document by about an order of magnitude. We have not completed the evaluation of external event, waiting for the

evaluation that is being done generic by the NRC. I think Bill Johnson can expand on the specifics.

MR. JOHNSON: Right. The analyses that has been presented in the RESAR SP/90 application determine a core damage frequency of approximately 1.3×10^{-6} and the probability of severe release, frequency of severe, significant release of 3×10^{-7}.

Those are substantial improvements relative to those that are typical for current plants and resulted from a number of the improved design features that had been evolved in the development of the SP/90 from its inception in 1983, primarily coming from reduction in reliance on operator actions, reduced core linear power heating, the placement of the core lower in the overall system to reduce the effect of LOCAs, core uncovery, improved reliabilities of emergency feedwater systems and approved reliabilities in additional systems for air to coolant pump support systems.

COMMISSIONER ROGERS: Now, those evaluations were done only for internal events though, I take it?

MR. JOHNSON: That's correct. They were done --

COMMISSIONER ROGERS: While awaiting the--

MR. JOHNSON: That's right.

COMMISSIONER ROGERS: Did you do a conditional containment failure probability?

MR. JOHNSON: We did not particularly do a conditional containment failure probability. We have taken an approach to primarily work toward the safety goal philosophies in terms of core damage frequency and frequency of severe release. We have prioritized our work on absolute probability, if you will.

Similar to what you heard somewhat earlier, in terms of conditional containment failure probabilities, they, by nature, have to exclude some sequences of particularly low probability and therefore we have primarily adopted an approach targeted towards the safety goal type criteria.

COMMISSIONER ROGERS: Can you say something about the reduced operator actions requirement of the SP/90 design problem?

MR. JOHNSON: Yes. One of the keys, for example, in that regard is the elimination of switch over during a large break loss of coolant from injection to recirculation by virtue of the inside containment storage tank which eliminates one of the areas which PRA had shown as being one of the higher demands on operator action requirements, one of the key areas.

COMMISSIONER ROGERS: To what extent is this a totally manually operated reactor? To what extent do you rely on automatic controls?

MR. JOHNSON: For the most part, the reactor is manually operated. The control systems, however, as most of the advanced control systems, has an integrated protection system and is microprocessor based, and does involve a substantial amount of control features which reduce the burden on the operator. But from a fundamental standpoint, it is a manually driven machine.

COMMISSIONER ROGERS: Coming back to the EPRI design requirements document, do I understand correctly that your design will -- that you view your completion of your design submissions to follow the EPRI design requirements document?

MR. CASO: In large amount, yes. I think it does follow significantly the --

COMMISSIONER ROGERS: I mean sequentially follow.

MR. CASO: No. We -- sequentially in time?

COMMISSIONER ROGERS: Yes.

MR. CASO: No. This model was developed before the EPRI requirements document was generated.

COMMISSIONER ROGERS: I understand that, but

then you are prepared to respond to that though, I take it.

MR. CASO: Yes. We definitely will have to look at the design that we have, vis-a-vis the EPRI design document. So far, we identify no major discrepancies between the requirements document and the plant as we have it. Definitely, we have not identified issues in terms of the safety criteria. There may be some operating parameters that may end up to be slightly different from the recommended EPRI requirements, but no problems. And, of course, as we indicated, we still have to factor in the severe accident considerations.

COMMISSIONER ROGERS: Yes. What is your strategy with respect to deferring severe accident and open SER issues to the final design approval? How are you dealing with that? Isn't that postponing something a little bit late?

MR. CASO: Well, at this point in time, we have completed the design of the plant and there is no specific need being identified from any utility to build such a plant. We plan to proceed and to complete a design and the application for the FDA for the final design approval at the time when an interest is going to be expressed. The nearest opportunity for

application of this plant is for a plant in Japan which yield to site difficulties and so on, is not something that has matured as fast as we would have expected.

So at this point in time, we believe that we will benefit by having the generic discussion of the severe accident through the EPRI requirements document and then backfit and evaluate the changes which we may introduce.

COMMISSIONER ROGERS: Thank you.

COMMISSIONER ROBERTS: Jim?

COMMISSIONER CURTISS: I have a number of things I want to cover. I'll begin with what I think your message is, if I could distill it.

What you're looking on the SP/90 for us to do is to issue the PDA by April of '90, and to complete the work on the evolutionary requirements document that EPRI has underway to approve that.

At the same time, I take it from what you've said that you view the market for the SP/90 or any reactor of that class to be almost exclusively foreign. In fact, of the three presenters today, I guess you've made the strongest statement, that you see the market for those reactors existing not in the United States but in foreign countries. And in turn,

you said that the question of priorities and our focus on the requirements document in the passive area ought to be driven by what I think you said were the domestic expressions of interest that we see emerge.

I guess the question that I have is, in view of those various statements, what's the rationale for asking the Agency to do anything on the SP/90, including issuance of the PDA, and to go forward with completion of the EPRI requirements document from your perspective -- I realize there are others that have an interest in that -- but to complete the evolutionary requirements document, if in fact we take as a given your statement that the interest is almost exclusively international in that arena?

MR. CASO: Okay. As I indicated, the work for the SP/90 is for all practical purposes completed. We have been working on this since 1983. "We" means Westinghouse and the NRC and the staff have been working since 1983. And being only a few months away from the completion, I feel that it is appropriate to put a ribbon around all the effort that has been done and not waste all the effort that has been spent in the last several years.

So we are not requesting to dedicate a very high level of effort, but we believe that we can

complete this under the assumption that I described previously and which will be discussed with the staff in the next few days. We can complete this effort reasonably quickly and get to the situation where we have at least closed in the proper binder and the proper situation the effort that has been expended to date.

As I indicated, while there are countries internationally that do not specifically require a stamp of approval from the regulatory entities in the United States, there are definitely other countries that do not intend to develop their own specific processes and criteria and they rely heavily on the United States' approval. And therefore, to have a design approval will benefit in that process. Given the fact that we are such a short distance away from that process, I think it makes sense to do it.

The other thing is that a lot of work has been done to complete several discussions and items. And if we don't, if we're not to complete this effort, this will potentially come up again in the future discussion. So I think it is of benefit for us to complete this.

Relative to the requirements document for evolutionary plant presented by EPRI, as you are well

aware the evolutionary requirements document has been for all practical purposes submitted for review, except for one volume, the MMI, while the submission of the documents for the passive plant has not happened yet.

Second thing, it is our understanding that a significant portion of the evolutionary requirements document is going to be utilized for the passive document. All the major principle introduction and several of the chapters that are not directly affected by the different safety concepts will be the same.

Therefore, for these reasons, we believe that there is a significant advantage to proceed right away on an expeditious basis in order not to waste any time to reach the completion of the LWR.

The basic point behind the summary that you presented summarizing our presentation, the basic point is that I strongly feel that the success that we have had in nuclear area in other countries versus some of the problems that we've experienced in this country is because other countries had more homogenous approach because of their institutional arrangements which allowed them to have a much more standardized process.

I believe strongly that in order to have a

successful return of nuclear power, we must move in the direction of having a standardized process. I do not see how we can have a standardized process if we build only one or two plants because we will go back exactly where we were before, where we have a combination and permutation of four vendors and 18 AEs and so many utilities.

I think we have to arrive to the point where we use a plan to design a set of requirements and documents that are going to be used for many plants, to the point many being definitely more than three or four -- hopefully we're going to make many more than that -- that will allow really to use the concept of a standard design. It is for these reasons that I really believe we have to work on the passive reactor and it's for this reason that I really strongly feel we should accelerate the effort to reach that goal.

The completion of the SP/90 and the evaluation of the evolutionary model is a step that allows us to make quick progresses in the direction of evaluating the passive requirements document.

COMMISSIONER CURTISS: Well, as I say, you've taken a much stronger stand than the other two vendors that made presentations today that the market in the States will be for the passive generation of

plants, the smaller, more modular plants that you and others are working on and not the evolutionary class of plants. I guess I'm just curious in view of the difference between your position and the others. Could you expand upon what's led you to that conclusion in a much stronger way than the others have set forth?

MR. CASO: Yes. Well, I hope because my crystal ball is shinier than the other ones. But independently of this capability to predict the future, I think it's essentially the need for standardization, Commissioner. I really believe that if we have to get the benefit of standardization, we have to use a model of plant design that is going to be utilized by several utilities, by many utilities.

I have difficulties to see the evolutionary plant as being able to provide the same benefits in terms of general acceptability by the different utilities and standardization that the passive plant will have.

So, if you look at some utilities, they may decide that they did not need standardization, they have enough standardization within themselves to be able to take a design and internalize it and use the processes for maintenance of operation, for training

and whatever is needed for operating the plant and achieve benefits within their own operation even though the designs are different.

But if you want to integrate and reach a standardization that is a broader application, I think you have to get to the point where you have a model that has acceptance not only by a few utilities but many utilities. And in this context, I think the passive reactor offers characteristics that are more generally acceptable.

COMMISSIONER CURTISS: Is that an attractiveness that is a function of the size of the reactor, in your judgment, or the prefabricated aspect or the modular aspect of these plants or their passive features or a combination of those?

MR. CASO: Well, I would take almost all the items you said without the pass -- in my mind, the passive intervenes because of the need to simplify the plant once you reduce the size. There is nothing that says that you cannot reach the same level of core melt frequency without using a passive, using active systems. We are designing a sizeable plant in the U.K. which has a similar level of core melt frequencies and releases, but it has been achieved with active components. So, you can reach the same

level without the components. So, the passive element comes in as the need for simplification.

I believe the items that lead to this conclusion are more the other items you mentioned. Given the fact that the return of nuclear power would probably entail a different relationship between the entities involved in the construction of the plant, between the vendor, the AE, the utilities, the bankers, the public utility commissions and so on, given the fact that the relation is going to be different, I think we must be in a situation where we can demonstrate the capability of the plant to operate properly, to be operated on an economic manner which means not only constructed at low price, low cost, in which case intervene with modularization and the cost certain and schedule certain. But also that it has a low value for operating and maintenance, which involves simplification. So, all these items tend to be tied together.

Now, when you look at the capabilities some smaller utilities may have or the capability to collect money on the street, at Wall Street, you see that the responsibility relative to the risk for the construction, for the operation, for the efficiency is going to be distributed on a different basis.

I believe the return on nuclear power is going to require the vendors to take a different and higher level of responsibility. I don't think we-- it is not going to be sufficient to do what was done in the '70s, where the vendors supplied the plant and basically relinquished their responsibility. The risk would be much more closely allocated to those that can control the risk. And to the extent that the supplier can control the schedule and the cost, we will have to be probably called to support that.

To the extent that the availability is going to be a condition in order to be able to collect money from Wall Street, then somebody will have to be responsible. The user will be required to guarantee some kind of reliability.

Now, all of this requires a greater level of standardization and a greater level of knowledge and capability to control.

COMMISSIONER CURTISS: Let me shift to one final topic. You've had a greater list of suggestions than the other two vendors had about the Part 52 process. I asked each of them if they had any suggestions or thoughts about the Part 52 procedures now that they're on the books and they've had an opportunity to take a look at them. Early on in your

presentation you gave us a list of areas where either the industry or the Commission or the both of us need to devote some additional attention.

There are two on that list that I guess I'd like to ask you about, the inspections, tests and analyses and the acceptance criteria. You mentioned that NUMARC is working on that issue. Do you see the challenge there as one that rests primarily with the industry in determining how to come up with the inspections, tests and analyses that the rule requires or is it a question of some need for clarification in more detail than the rule sets forth as to exactly what level of inspections, tests and analyses we will require?

MR. CASO: It cannot be the industry by itself. That's clear. There is no way the industry by itself can resolve the problem. There is going to be a need to reach a consensus between the NRC and the industry on what is really needed. There is no --

COMMISSIONER CURTISS: I guess I thought the rule was clear on that point.

MR. CASO: Yes.

COMMISSIONER CURTISS: I don't have Part 52 with me, but I gather it said something to the effect that we'd like to see, up front, all the inspections,

tests and analyses necessary together with the design --

MR. CASO: That's right.

COMMISSIONER CURTISS: -- necessary to demonstrate the acceptability of the plant. Is there something that's unclear about that?

MR. CASO: No, no. It is not a matter of the rule.

COMMISSIONER CURTISS: Okay.

MR. CASO: I apologize. But I was just going to specifically say that we don't see the need to change the rule, we see the need to have a significant amount of work to define what is going to be included in this inspection, test and acceptance criteria. We don't see those issues, those criteria to be limited to the design process by itself. For example, one of the issues that could be included is the emergency plan. What are the criteria that one would have to satisfy in order for the emergency plan to be approved once the plant is built? So, we have to define all this. The only reason to raise it is not to say, "Change the rule." The reason to raise it is there is a significant amount of work that needs to be done and we'd better get on with it --

COMMISSIONER CURTISS: Okay.

MR. CASO: -- if we want to achieve the result by 1994.

There is another item where I said that I think there is a need for -- maybe there's going to be a need for a change in the rule and that is related to the second hearing where we have to define what exactly the second hearing is, whether that is going to be achieved with or without the change in the rule.

COMMISSIONER CURTISS: Actually, the second area that I was interested in had to do with the emergency plan provisions. In your presentation you suggested that we take a look at the feasibility of applying the inspections, tests and analyses approach to emergency planning. So, I gather from what you say that the acceptability of the emergency plan could not only be presented on paper, but demonstrated in some way through a set of inspections, tests and analyses up front and litigated at the COL stage.

I guess the question that I have is isn't that what, in effect, an exercise is today? It is a test of sorts of the emergency plan. I'm curious to know if you have any thoughts at this point that go beyond what kind of inspection, tests and analysis that we do today.

MR. WIESEMANN: I think the problem is that

there is no standard at the present time. The court was unable to find a standard for accepting an emergency plan. Basically, I think the staff or the Commission took the position that the purpose of the test was to determine whether the plan was acceptable or not. So, it was sort of, "You do it, we'll look at it and we'll tell you what needs to be fixed."

The approach that the court left the door open for us was that, "If you could come up in advance with what are the requirements for an acceptable emergency plan." We think that there have been enough of them prepared it should be possible to identify what are the elements of a successful emergency plan. Once you've identified those elements, to identify what it is that needs to be done to demonstrate that each of those elements are in place, and what are the acceptance criteria by which you're going to judge whether or not they are adequate or not, and once that's done, then what the -- you still may want to do the exercise because you don't want people to enter into this program for the first time when it's really needed. But the plan then serves a different purpose. Instead of being there to determine whether the plan is acceptable or not, it's there to determine whether or not the people are -- to demonstrate that the

people are knowledgeable about the plan and can perform the functions --

COMMISSIONER CURTISS: What you essentially have to do is come up with a test that permits some sort of objective evaluation.

MR. WIESEMANN: Right.

COMMISSIONER CURTISS: If you come up with an exercise that requires some kind of subjective evaluation, I gather the court was saying that's not the kind of inspection, test and analyses that we normally think of when you go out and run your diesels for 100 hours or do the kinds of inspections, tests and analyses that we typically thought of.

I don't want to pursue it here any further, but I'd be interested, I guess, at some point, to hear the thoughts of anybody on the subject of whether it's possible to come up with the kind of inspections, tests and analyses in the emergency planning context that do lend themselves to objective verification.

That's all I have, Tom.

COMMISSIONER ROBERTS: Well, we thank you for coming and thank you for a very interesting presentation. We'll adjourn.

(Whereupon, at 3:25 p.m., the above-entitled matter was adjourned.)

CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING BY WESTINGHOUSE ON ADVANCED PWR PROGRAM

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: NOVEMBER 1, 1989

were transcribed by me. I further certify that said transcription is accurate and complete, to the best of my ability, and that the transcript is a true and accurate record of the foregoing events.

Reporter's name: Peter Lynch

11/1/89

SCHEDULING NOTES

Title: Briefing by Westinghouse on Advanced PWR Program

Scheduled: 2:30 p.m., Wednesday, November 1, 1989 (OPEN)

Duration: Approx 1 hr

Participants: Westinghouse 60 mins

- Carlo Caso, General Manager
  Nuclear and Advanced
  Technology Divisions
  - Industry Perspective
  - Westinghouse Perspective
  - SP/90 Status

- Brian McIntyre, Manager
  Advanced Plant Safety and Licensing

- Bill Johnson, Manager
  Nuclear Safety Department

WESTINGHOUSE ELECTRIC CORPORATION

A PRESENTATION TO THE

NUCLEAR REGULATORY COMMISSION
ON THE

WESTINGHOUSE ELECTRIC CORPORATION

ADVANCED PWR PROGRAMS

ROCKVILLE, MD

NOVEMBER 1, 1989

WESTINGHOUSE ELECTRIC CORPORATION

NUCLEAR REGULATORY COMMISSION BRIEFING

ADVANCED PWR PROGRAMS

NOVEMBER 1, 1989

CARLO CASO, GENERAL MANAGER,
NUCLEAR AND ADVANCED TECHNOLOGY DIVISION

I. INTRODUCTION
   - A. INDUSTRY PERSPECTIVE
   - B. WESTINGHOUSE PERSPECTIVE
   - C. WESTINGHOUSE PLANT PROGRAM SUMMARY

II. SP/90 STATUS
   - A. DESIGN
   - B. NRC REVIEW
   - C. DIRECTIONS

III. SUMMARY

A PRESENTATION TO THE NUCLEAR REGULATORY COMMISSION ON THE

WESTINGHOUSE ELECTRIC CORPORATION ADVANCED PWR PROGRAMS

ROCKVILLE, MARYLAND
NOVEMBER 1, 1989

LICENSING CERTAINTY

- REQUIRED BY DOMESTIC NUCLEAR MARKET
- DESIGN CERTIFICATION
  - LICENSABILITY OF DESIGN
- STANDARDIZATION RULEMAKING
  - IMPLEMENTATION OF DESIGN - ITAAC
  - LICENSABLE AFTER CONSTRUCTION

LICENSING CERTAINTY (CONT')

- EPRI UTILITY REQUIREMENTS
  - UTILITY CONSENSUS OF DESIGN NEEDS
  - RESOLUTION OF GENERIC ISSUES

EMPHASIS NEEDED

- STAFF IMPLEMENTATION OF PART 52
  - ITAAC
  - ENVIRONMENTAL IMPACT ISSUES
  - EMERGENCY PLAN PROVISIONS
  - CERTIFICATION RULEMAKING PROCEDURES
  - PROPRIETARY INFORMATION
  - FORMAT & CONTENT OF D.C. APPLICATION
  - FORMAT & CONTENT OF D.C. RULE
  - INTERFACE WITH NON-CERTIFIED DESIGN ASPECTS

EMPHASIS NEEDED (CONT')

- REGULATORY REVIEWS FOR STANDARD PLANT DESIGNS
- EPRI/UTILITY REQUIREMENTS DOCUMENT FOR GENERIC ISSUES

WESTINGHOUSE PERSPECTIVE

- EVOLUTIONARY PLANT PROGRAMS
  - MODELS DEFINED
  - DESIGN APPROVALS NEAR COMPLETION
  - DESIGN CERTIFICATION UPON COMPLETION OF:
    1. PROCEDURES FOR IMPLEMENTATION
    2. RESOLUTION OF TECHNICAL ISSUES (EPRI REQ DOC)

WESTINGHOUSE PERSPECTIVE (CONT')

- PASSIVE PLANT PROGRAMS
  - CONCEPTS DEFINED
  - CERTIFICATION PROCESS INITIATED
  - APPLICATION OF EVOLUTIONARY REQUIREMENTS
  - EARLY ISSUE RESOLUTION
  - MARKET READY WITHIN NEXT DECADE

WESTINGHOUSE PERSPECTIVE (CONT')

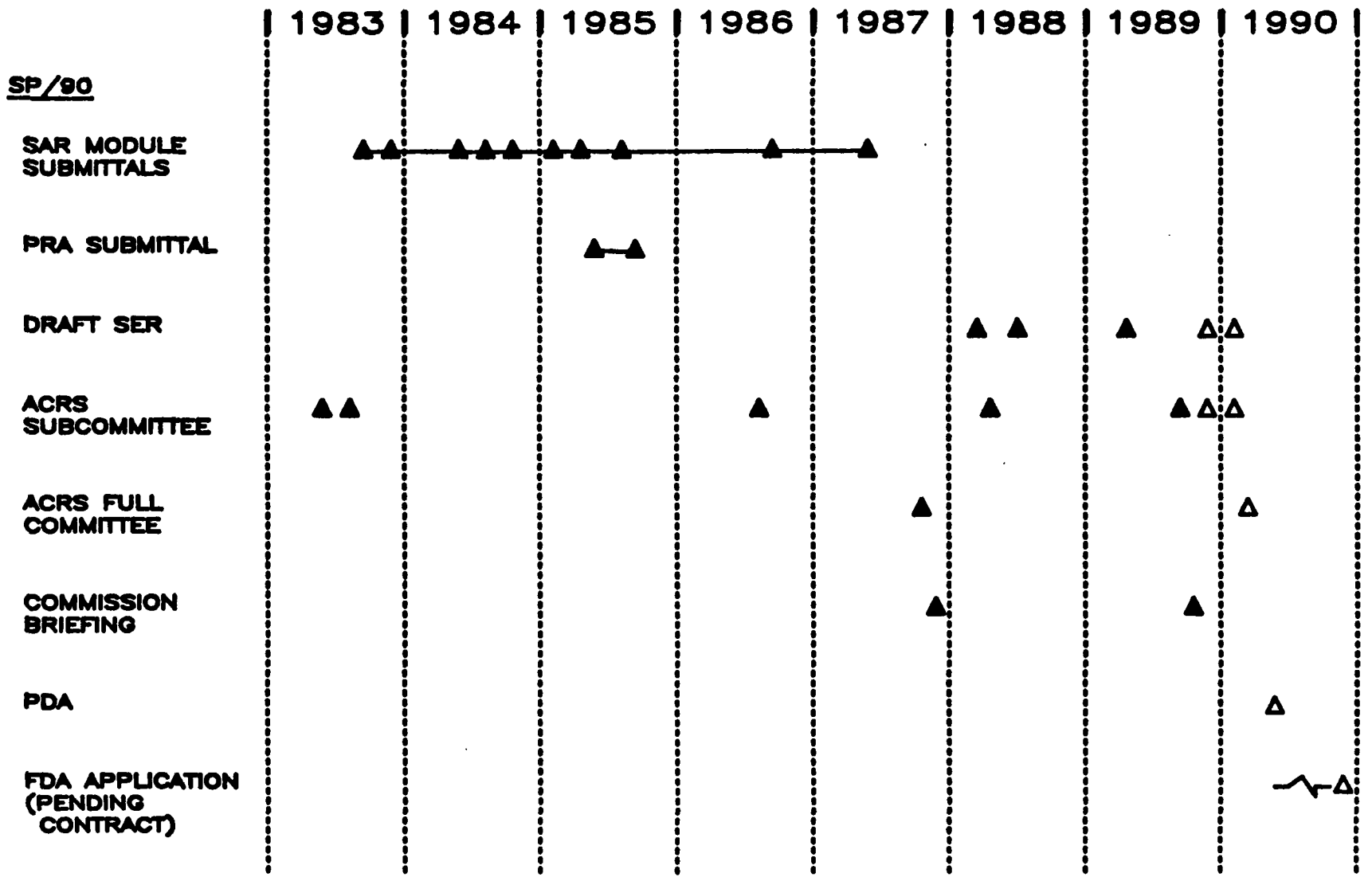
- EPRI ALWR REQUIREMENTS PROGRAM
  - RESOLUTION OF GENERIC ISSUES
  - COMMON REQUIREMENTS

WESTINGHOUSE STANDARDIZATION PROGRAMS

SP/90

- o EVOLUTIONARY ALWR
- o 1300 MWe
- o RESPONSIVE TO EPRI/UTILITY REQUIREMENTS
- o NRC REVIEW FOR PDA NEAR COMPLETION

WESTINGHOUSE SP/90 PROGRAM SUMMARY



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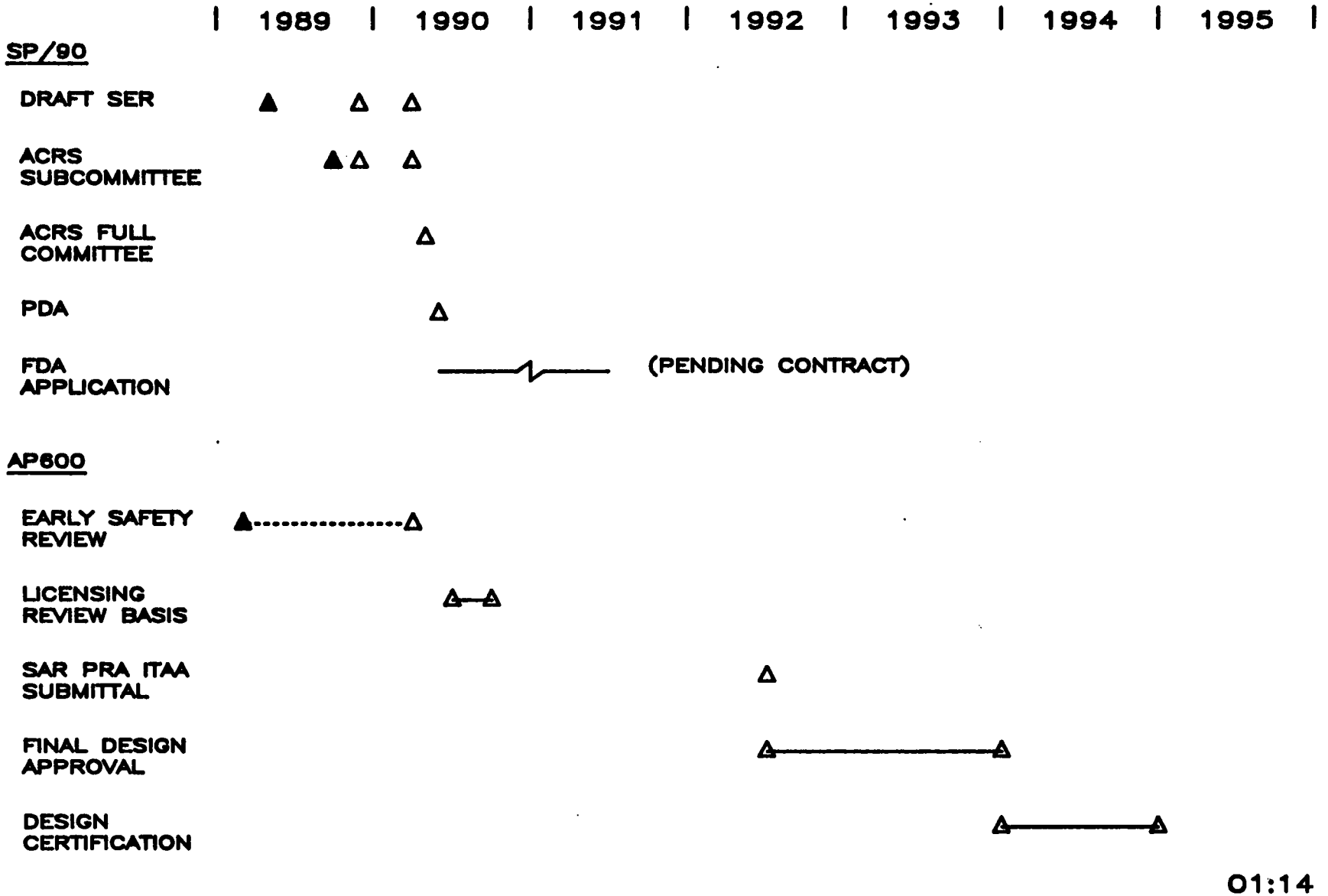
WESTINGHOUSE STANDARDIZATION PROGRAMS

AP600

- o PASSIVE ALWR
- o 600 MW_E
- o BEING DEVELOPED IN CONCERT WITH EPRI/UTILITY REQUIREMENTS
- o DETAILED DESIGN/DESIGN CERTIFICATION PROCESS INITIATED

WESTINGHOUSE ADVANCED PWR PROGRAM SUMMARY



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SP/90 INTERMEDIATE DESIGN IS COMPLETE

- INTERNATIONAL PARTICIPATION
- HIGHER RATED OUTPUT
- PRA BASED DESIGN
- CONVENTIONAL SAFETY SYSTEM CONCEPTS
- DEDICATED SAFETY SYSTEMS
- INCREASED MARGIN

SP/90 INTERMEDIATE DESIGN IS COMPLETE

- STATE-OF-THE-ART DIGITAL CONTROL AND PROTECTION SYSTEMS
- REDUCED OPERATOR ACTIONS
- NO FURTHER TESTING OR DEVELOPMENT
- AVAILABLE IN VERY NEAR FUTURE
- INTERNATIONAL MARKET FOR ADVANCEMENT OF PROVEN LWR DESIGN

SP/90 REVIEW STATUS

PRA FRONT END	DRAFT SER 3/21/88
AUXILIARY REVIEW	DRAFT SER 6/10/88
SYSTEMS REVIEW	DRAFT SER 3/9/89
PRA BACK END	DRAFT SER EXPECTED 11/89
USI/GSI RESOLUTIONS, & REG CONFORMANCE	DRAFT SER EXPECTED EARLY 1990

RESOLUTION OF DRAFT SER OPEN ISSUES

CLARIFICATION PROVIDED BY W	59	
RESAR REVISED	28	
ISSUES CONSIDERED CLOSED		87
NRC REVIEW NOT COMPLETE	12	
NEW METHODS NOT REVIEWED BY NRC	3	
REQUIRE ADDITIONAL EFFORT	5	
ISSUES REMAINING		20
TOTAL DRAFT SER ISSUES RECEIVED		107

WESTINGHOUSE PERSPECTIVE OF PDA FOR RESAR SP/90

- DOCUMENTS THE REVIEW THAT HAS BEEN COMPLETED WITH A CLEAR INDICATION OF WHAT ACTIONS NEED TO BE COMPLETED FOR FDA/DC

- "PRELIMINARY" NRC STAFF SAFETY EVALUATION OF DESIGN FEATURES

WESTINGHOUSE PERSPECTIVE OF PDA FOR RESAR SP/90 (CONT')

- "PRELIMINARY" NRC STAFF SAFETY EVALUATION OF SAFETY ANALYSES
- PROVIDES FOR RESOLUTION OF "SEVERE ACCIDENT ISSUES" AFTER EPRI UTILITY REQUIREMENTS DOCUMENT SAFETY EVALUATION

BENEFITS OF SP/90 PDA COMPLETION

- PRESERVES EXPENDITURE OF EFFORT INVESTED
- FORMALIZES AGREEMENTS REACHED TO DATE
- SUPPORTS MARKET FOR LARGE PLANTS, OFFSHORE
- ALLOWS STAFF TO FOCUS ON PART 52 IMPLEMENTATION

SP/90 PROGRAM

- NEAR TERM OBJECTIVE
  - ISSUE SP/90 PDA BY APRIL, 1990
- STRATEGY
  - COMPLETE ACRS REVIEWS
  - DEFER SEVERE ACCIDENT TO FDA
  - DEFER OPEN DSER ISSUES TO FDA

SP/90 PROGRAM (CONT')

- LONG-TERM OBJECTIVES
  - INCORPORATE BENEFITS OF EPRI UTILITY REQUIREMENTS IN FDA
  - FDA/DC PROGRAM BASED ON MARKET NEEDS

SUMMARY

DESIGN STANDARDIZATION PROCESS IS CRITICAL TO NUCLEAR RENAISSANCE

- 10 CFR 52 IMPLEMENTATION IS KEY

SUMMARY (CONT')

WESTINGHOUSE STANDARD DESIGN PROGRAMS ARE RESPONSIVE TO INDUSTRY NEEDS

- SP/90 PROVIDES FOR NEAR-TERM NEED FOR LARGE PLANTS, PRIMARILY INTERNATIONAL
- AP600 PROVIDES FOR U.S. MARKET FOR SMALLER, SIMPLER PLANT
- EPRI/UTILITY REQUIREMENTS PROGRAM WILL ESTABLISH RESOLUTION TO GENERIC ISSUES