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NUCLEAR REGULATORY COMMISSION

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NUCLEAR REGULATORY COMMISSION

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BRIEFING BY ADVANCED REACTOR CORPORATION

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PUBLIC MEETING

Nuclear Regulatory Commission  
One White Flint North  
Rockville, Maryland

Friday, September 10, 1993

The Commission met in open session,  
pursuant to notice, at 10:30 a.m., Ivan Selin,  
Chairman, presiding.

COMMISSIONERS PRESENT:

IVAN SELIN, Chairman of the Commission  
KENNETH C. ROGERS, Commissioner  
FORREST J. REMICK, Commissioner  
E. GAIL de PLANQUE, Commissioner

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## STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

MARTIN G. MALSCH, Office of the General Counsel

LOUIS LONG, Chairman, ARC Utility Management Board

PAT McDONALD, Executive Director, ARC

JOHN TAYLOR, Vice President, EPRI

ZACK PATE, President, INPO

JOE COLVIN, President, NUMARC

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

10:30 a.m.

CHAIRMAN SELIN: Good morning, ladies and gentlemen.

The Commission welcomes representatives from the Advanced Reactor Corporation and from other related industry organizations, the Electric Power Research Institute, the Institute for Nuclear Power Operations, and the Nuclear Management and Resources Council, all of which are supporting the work of the Advanced Reactor Corporation on standardization of future nuclear plant designs.

As I'm sure you're aware, the Commission is considering these designs for certification based on a partial design. It's full in concept, but partial in detail, and then the function of the Advanced Reactor Corporation is to take two of these designs and carry them out into greater detail so that utilities, when and if prepared to order reactors, will have a more full design to consider when they make their decisions.

The Commission considers the licensing and standardization of future nuclear plant designs to be one of NRC's highest priorities and we are very pleased to hear today from our distinguished

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1 representatives on the status of industry efforts in  
2 support of this effort. Today we'll be briefed by  
3 these organizations on the status of first-of-a-kind  
4 engineering, siting, utility requirements document,  
5 design certification and life cycle standardization,  
6 and finally their views on predictable licensing and  
7 stable regulation. The "finally" is to say don't give  
8 us their views until you go through the other topics  
9 first. Otherwise, we'll never get to the other  
10 topics.

11 The Corporation last briefed the  
12 Commission on the status of first-of-a-kind  
13 engineering in June of 1992. We've been regularly  
14 kept abreast of the activities through written  
15 documents and staff presentations.

16 Copies of the slide presentation are  
17 available at the entrance to the meeting room.

18 Commissioner Rogers?

19 COMMISSIONER ROGERS: Nothing.

20 CHAIRMAN SELIN: Commissioner Remick?

21 COMMISSIONER REMICK: Just a few comments  
22 I'd like to make to hopefully put into perspective  
23 this meeting from my own viewpoint.

24 If we go back a few years ago, early on as  
25 a Commissioner for me, we had in-depth discussions

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1 with the industry on the question of depth of detail  
2 necessary for design certification. Within the Agency  
3 we had differences. There were some views that not  
4 only should the depth of detail presented be adequate  
5 to make the safety decisions that the Agency had to  
6 make, but that the design should be complete and  
7 complete so that the Agency could assure that there  
8 would be standardization of the plants throughout the  
9 life cycle of the plants. Industry at that time  
10 expressed a view, and I think rightfully so, that  
11 perhaps this was going beyond the authority and  
12 responsibility of the Agency.

13 I remember in one of those meetings I  
14 threw out the concept, just off the top of my head,  
15 perhaps we should have something like ASARA, A-S-A-R-  
16 A, as standard as reasonably achievable. Of course  
17 that idea kind of went with a lot of other good and  
18 naive ideas, but industry did begin to talk then about  
19 something called "commercial standardization" and how  
20 they would assure commercial standardization and how  
21 that was their responsibility and interest. People  
22 like Pat McDonald I know at that time were talking  
23 commercial standardization should go to standardized  
24 training programs and maintenance programs and things  
25 like that and I think that's now become called "life

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1 cycle standardization." And then something cropped up  
2 called "first-of-a-kind engineering" and I don't think  
3 I ever admitted outside my office staff I never quite  
4 fully understood what that was. I had some ideas, but  
5 I was never completely sure what it meant.

6 And then it was a pleasure for me to be  
7 asked several months ago to go to one of the early  
8 meetings of the ARC, Advanced Reactor Corporation, to  
9 give an after dinner talk. While there, I spent some  
10 hours sitting in and listening to the discussion. I  
11 think this was about the second official meeting. At  
12 least it was very soon, either the day or the day  
13 after Westinghouse and DOE signed the contract on  
14 first-of-a-kind engineering for the AP-600.

15 I came back and told my staff and some  
16 others, "I think I finally understand what these words  
17 mean," and I expressed to them, I said, "I now see  
18 design certification as a process to assure that the  
19 plants are designed to be alike, that commercial  
20 standardization is an effort to assure that the plants  
21 are built to be alike and life cycle standardization  
22 is a process to assure that they are maintained to be  
23 kept alike." And I thought, since the light had lit  
24 in my head, that perhaps others maybe were in the same  
25 way, that they didn't completely understand what

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1 first-of-a-kind engineering was, so I suggested this  
2 meeting.

3 Now one of the reasons that I think that  
4 I began to understand as a result of spending the day  
5 there listening to the vendors, the utilities, the DOE  
6 and the INPO personnel talk about this is they used  
7 specific examples. I began to realize that they were  
8 talking about minimizing the number of things like  
9 breakers and motor control centers, motor sizes and  
10 characteristics, pump sizes and characteristics, even  
11 pipe sizes and schedules and so forth. In other  
12 words, rather than allowing the designers for each  
13 system to custom design those systems, that it was  
14 possible to use a minimum set of approved, let's say,  
15 motors or pumps and so forth, that they would utilize  
16 those rather than going off in a custom area. This  
17 would have benefits, then, in writing the  
18 prescriptions for ordering in procurement, in stock-  
19 piling spare parts, warehousing and things like this.  
20 And then also, people talked about such things as  
21 standardization in maintenance programs, in training  
22 and security and things like that.

23 My only purpose in bringing up this to  
24 your point this morning, as I looked at your slides it  
25 looked like you were going to be discussing mostly

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1 organization and process and I would hope that as you  
2 go through that, if you can give us specific examples  
3 of the type of things that this will result in, I  
4 think it would be very helpful in also us seeing the  
5 overall picture of what this process amounts to.

6 MR. McDONALD: May I make a comment on  
7 that while your words are fresh? Because, that was a  
8 very good summary that the Commissioner gave.

9 Each of the two designs, as a part of the  
10 FOAKE contract, provides a standardization plan that  
11 provides the type of things you're talking about to  
12 assure that you won't have ten different models of  
13 valves where you could maybe get away with just three.

14 COMMISSIONER REMICK: Right.

15 MR. McDONALD: We are going to give you a  
16 broad overview, but I hope we pick up this thread  
17 through the presentation.

18 COMMISSIONER REMICK: Thank you.

19 CHAIRMAN SELIN: Commissioner de Planque?

20 Mr. Long?

21 MR. LONG: Okay. On behalf of the  
22 Advanced Reactor Corporation, it is a pleasure to come  
23 back and kind of give you an update of what's happened  
24 to us over the last year. Frankly, quite a lot has  
25 happened. As you may recognize, to begin with, we

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1 have a little different set of characters up here,  
2 partly due to the expanded scope of the Advanced  
3 Reactor Corporation.

4 Last year we talked about FOAKE, first-of-  
5 a-kind engineering, and that was our total emphasis at  
6 that time. We had a contract that we signed back in  
7 February of '92 with the Department of Energy to enter  
8 into a cooperative agreement to manage the first-of-a-  
9 kind engineering program, and so we've been proceeding  
10 along with that. But in addition to that, the NPOC  
11 has assigned us some additional responsibilities for  
12 coordinating some of the other building blocks that  
13 are in the NPOC plan and Pat McDonald is going to talk  
14 a little more in detail about that later on. So we've  
15 got an expanded scope and that's why you see some  
16 different people up here to reflect the kind of  
17 additional support we've gotten in the industry that's  
18 coming together under the Advanced Reactor  
19 Corporation.

20 I've included in the set of slides kind of  
21 a simplified chart. One of the things the Advanced  
22 Reactor Corporation did do was change our managing  
23 structure a little bit. We changed our title from a  
24 PMB to a Utility Management Board. I'm not sure  
25 exactly what the significance of that is, except that

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1 we just wanted to show that we changed and we've just  
2 got a more inclusive group of people on the Utility  
3 Management Board, whereas before we had kind of a  
4 small subset managing the activities.

5 We have hired a full-time Executive  
6 Director, Mr. Pat McDonald, to manage our program as  
7 opposed to a part-time executive. Pat, by virtue of  
8 his previous involvement and commitment to the  
9 advanced light water reactor program has just been an  
10 ideal fit to our organization.

11 We have instituted utility sponsor groups  
12 to oversee the design of both the Westinghouse AP-600  
13 and the GE ABWR.

14 We've developed project management staffs  
15 that are actually out at the office of the reactor  
16 vendors and that was kind of a major decision for us.  
17 We're going to have kind of a tight group in  
18 Washington, D.C. We're actually going to get out  
19 there where the work is being done and we decided to  
20 have our people out at the sites of the vendors so  
21 they can work with them hand in glove getting our  
22 input into their products as the products are being  
23 developed.

24 As you know, we have a fairly broad set of  
25 membership for the Advanced Reactor Corporation. Some

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1 15 utilities are contributing monies in times that are  
2 very, very tight out there. Even some people who have  
3 dropped out of EPRI have remained in this program and  
4 I think that reflects the commitment of the industry  
5 to the program and I think reflects on how important  
6 we see this as to the future of our industry. Some of  
7 this too, I think, reflects some of the results of a  
8 survey that was done back in 1992 that asked of those  
9 people who were considering baseload generation,  
10 "Would you consider nuclear?" Some 75 percent of  
11 those people said that they would consider the ALWR if  
12 the program goes forward as contemplated in the  
13 strategic plan.

14 We are also considering expanding this  
15 group and there's a solicitation to add others. Even  
16 some foreign utilities are expressing interest in  
17 joining our group.

18 It was decided by NPOC, since these people  
19 are the ones who are most interested in the advanced  
20 reactor program, that they ought to be the ones who  
21 manage these other building blocks, so that's kind  
22 of -- because of their interest in this program,  
23 that's why these utilities were assigned  
24 responsibility for coordinating the activities in the  
25 other building blocks.

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1 Just a quick reminder of the DOE and EPRI  
2 cooperative agreement. That was initially supposed to  
3 be a \$200 million program involving passive and  
4 evolutionary kind of designs. Because of the  
5 relatively limited funds that we had, we decided that  
6 rather than just spreading the money over the four  
7 designs, we would rather develop fully two of those  
8 designs, one large plant and one small plant, and get  
9 a good picture of what the cost of those plants would  
10 ultimately be, rather than, again, just spreading the  
11 money across all of them, and so we had a down-  
12 selection process and the ABWR and the AP-600 were  
13 selected.

14 As part of that, we expanded that \$200  
15 million program into a \$276 million program in order  
16 to get all of the first-of-a-kind engineering work  
17 done, and the vendors committed to an additional  
18 amount of support in order to get the total scope that  
19 we had anticipated getting done completed. We were  
20 very gratified to finish those negotiations and sign  
21 those contracts. The selection process was obviously  
22 a very complicated one and we had to be very careful  
23 about how we did that, but I think we were satisfied  
24 that the industry was satisfied with the selection  
25 that was made.

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1                   At this point, I'd like Pat McDonald, our  
2                   Executive Director, to go ahead and talk to you about  
3                   some of the details of our program.

4                   MR. McDONALD: Thank you, Lou.

5                   (Slide) First, I'd like to put on the  
6                   screen before you the assignment made by NPOC to the  
7                   ARC organization about the coordination of building  
8                   blocks 2, 3, and 4. That is significant and as we go  
9                   through I will try to talk about the management by ARC  
10                  vis a vis the coordination by ARC.

11                  The building blocks themselves are  
12                  grouped, as you will see from your handout, by two  
13                  that are generic in nature and then four that are  
14                  project-specific. In terms of the organization, I  
15                  have a busy organization and I'm going to break that  
16                  down, but I would like to call your attention to the  
17                  overall organization and the fact that there are dark  
18                  lines all through it. That's meaning the word  
19                  "coordination" and not necessarily the ARC  
20                  organization, because it will differ when you get down  
21                  to who is reporting to whom and the responsibilities.

22                  (Slide) So from that overall, I'll  
23                  proceed to the next chart which says "ARC FOAKE  
24                  Management. From that organization can be seen that  
25                  on the right flank and left flank the ARC ABWR utility

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1 sponsor group is a key group that is intended to be  
2 very active. Supporting that group, we have  
3 contingents of people at home corporate offices which  
4 would be participating in the reviews which we  
5 describe. Today's electronic networks make that type  
6 of thing real possible on a real time basis.

7 The project manager location which Lou  
8 talked about at each Pittsburgh and San Jose office  
9 does have on-site people. They're on the site there  
10 now and they are really, you might say, the direct  
11 responsibility chain of command for ARC carrying out  
12 its direct management of the FOAKE process. Now those  
13 are just mirror images, the same on both sides.

14 (Slide) So, to get on a little bit and  
15 talk about what the scope of work is, the first thing  
16 on the docket is called "detailed engineering that is  
17 not site-specific." Commissioner Remick mentioned  
18 that. Let me state that detailed engineering again.  
19 It's somewhat hard to get the words just right.

20 John Taylor is my automatic check speller  
21 on these things. Most of us use those in computers  
22 these days and they're very handy. Well, I'd like  
23 John to check on me on what I say.

24 But, first-of-a-kind engineering is  
25 intended to be all the generic detailed engineering

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1 that's necessary for a plant that's not site-specific  
2 and that leads up to a form, fit, or function  
3 identification at that point for the major components,  
4 there's about seven or eight including things like the  
5 pressure vessel, where the very detailed  
6 specifications are a part of the contract and the  
7 remainder of data for detailed specifications and the  
8 format and examples are provided. So, if we were to  
9 go any further, we would have to make some  
10 arrangements for procurement. So if we think of it as  
11 all the generic design that's required in terms of  
12 details before you have to make commitments for  
13 procurement, that's pretty right.

14 John, would you add anything to that?

15 DOCTOR TAYLOR: I'd just say our goal is  
16 to have done enough work that a cost and schedule  
17 estimate could be made with the appropriate  
18 construction sequencing that would be meaningful in  
19 terms of a sponsor coming forth willing to make the  
20 commitments for procurement.

21 MR. McDONALD: Yes, and we were very  
22 definite in that definition and in the detailed  
23 deliverables to assure that we had a very well-  
24 identified scope of work for people to look at and go  
25 forward with.

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1           There are other deliverables other than  
2           the detailed first-of-a-kind engineering details. In  
3           fact, the deliverables, there's some 10,000 individual  
4           line items of deliverables and they're divided into  
5           levels. The level 1 deliverable, which is somewhere  
6           in the neighborhood of 1,500, I think, requires a  
7           detailed review and approval by the ARC organization  
8           according to the contract.

9           There are other deliverables other than  
10          the strictly design deliverables. Of course, there's  
11          the QA program, things for spare parts, the  
12          standardization plan. The standardization plan, of  
13          course, goes hand in hand with the spare parts and  
14          with almost every aspect. There's an information  
15          management segment, and this is somewhat interesting  
16          and at the same time challenging.

17          We require each contractor to have an IMS  
18          system to show how he is doing -- he or she,  
19          Commissioner de Planque, excuse me -- how they are  
20          doing the design so we can follow what they're doing,  
21          but it has to be convertible to a neutral file so that  
22          it then can be taken up by a follow-on or some overall  
23          IMS system and turned into a complete project. Now  
24          I'll make some more comments about that later. That's  
25          one of the challenges we have downstream.

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1           There's also a construction plan and  
2 several other plans that are trying to round this out  
3 to provide a good complete package to look at when  
4 FOAKE is done to proceed on with further work where  
5 procurement is required.

6           The basic process for this as far as the  
7 management is really the deliverables. We have  
8 ourselves oriented around the deliverables. We have  
9 schedule for those deliverable. We have a review  
10 process where they're reviewed by the utility sponsor  
11 groups. They're reviewed by the ARC staff and of  
12 course by the extensions of those organizations at the  
13 home corporate offices of our members, and then the  
14 approvals are done by ARC officials.

15           The oversight is very important in this  
16 process. Its importance reaches beyond that of  
17 assuring the contract is properly carried out and  
18 approved. It goes into the participation which the  
19 various utilities have in it. We feel that only  
20 through a strong participation can we really find the  
21 niche and crannies that we need to dig out to develop  
22 things, can we develop the kind of attitude that will  
23 help us carry out the very strict standardization  
24 we're trying to achieve like in the standardization  
25 plans, so we've gone to great length to have a lot of

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1 industry involvement.

2 The utility sponsor groups have anywhere  
3 from up to 15 people on them and they meet about every  
4 other month. It's quite a task to get that many  
5 people together of those two organizations, in fact,  
6 with the Utility Management Board, together, but we  
7 have a lot of interchange that way.

8 I would also like to point out that on the  
9 FOAKE contract we share this responsibility with the  
10 Department of Energy, just like we also share a part  
11 of the responsibility for design certification, and I  
12 think that that understanding of our sharing with DOE  
13 is basically the management of this contract. We  
14 actually have a contract with DOE to manage this  
15 FOAKE, and so we're directly responsible just like in  
16 any business venture.

17 COMMISSIONER REMICK: So "USG oversight"  
18 doesn't stand for U.S. government oversight?

19 MR. McDONALD: No, no, no. I wish I could  
20 think of some quick come-back, but I can't.

21 COMMISSIONER ROGERS: To what extent are  
22 DOE people actually involved in things like reviewing,  
23 the reviewing process?

24 MR. McDONALD: They're pretty deeply  
25 involved and we work together quite closely. For

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1 example, in virtually all the meetings of the USG, the  
2 UMB, the Utilities Steering Committee we have DOE  
3 representatives attend. I don't remember one there  
4 hasn't been representatives there.

5 Now in addition to the direct management  
6 of the products, we look at other aspects of those,  
7 and that is we conduct conformance assessments -- you  
8 might call those audits, but they go further than an  
9 audit would -- of how the work is being carried out.  
10 Is it complying with the utilities requirement  
11 document? Is it complying with the submittals of the  
12 design certifications? It's a check. It's a check so  
13 that if we find a problem we can follow-up in more  
14 depth.

15 Design reviews, we conduct design reviews  
16 of items. If there's an area we don't quite  
17 understand -- and some of those areas have been  
18 involved, some of the passive features of the plants,  
19 some of the innovative applications which are proven  
20 technology but they haven't been used in this way  
21 before -- we will conduct design reviews of them and  
22 go into great detail and depth on those.

23 And of course we have schedular reviews at  
24 the same time, because that's part of the contract,  
25 part of the commitments made by the utilities we've

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1 contracted with for certain amounts of money over a  
2 period of time, and we have to fulfill those.

3 There are a great many other day to day  
4 actions between the on-site ARC staff and the design  
5 team and that's a very healthy part of managing that.

6 I could almost go on to more detail than  
7 you want to hear about the amount of activities we  
8 have. I would like to mention a few.

9 The testing progress. The testing  
10 programs are very important and we have a test  
11 committee set up which reviews the layout of those  
12 test programs and tracks the result as we go along.  
13 That is an important thing and we review the results  
14 with the vendor.

15 The standardization plans which we were  
16 just talking about.

17 The IMS systems.

18 Another one which I think most of you have  
19 asked about in one way or another is what happens with  
20 time when our utility requirement document changes.  
21 We expect that to be a living document as long as  
22 we're learning things and we will continue to learn  
23 things throughout the FOAKE process, so we will make  
24 changes to the utility requirements document as we  
25 feel are prudent, are prudent for the overall vision

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1 of how we started out, and that is to make  
2 requirements for plants which people will want to buy  
3 and which they feel like they can operate in a very  
4 safe and economical manner.

5 The utility sponsor group must have  
6 concurrence with any changes which we make and the --  
7 I can't stop this review process without talking about  
8 cost. We also review the cost effectiveness of the  
9 programs as we go along. We have those, as you might  
10 expect, in progress now in both of our projects.

11 (Slide) The coordination in this chart,  
12 I have dotted lines and hard lines and the dotted  
13 lines are coordination functions. I'm not going to  
14 say too much about this, because we have three other  
15 parties who will speak quite well to the activities  
16 going on. John Taylor will follow me and talk about  
17 the center block that EPRI has, and then Zack Pate  
18 will talk about life cycle standardization, and then  
19 Joe Colvin about the regulatory stabilization.

20 You will notice that the coordination  
21 blocks going to the design certification is a dashed  
22 line. That's because in our NPOC plan each of the two  
23 vendors there have responsibility for those blocks and  
24 then contractual-wise the contracts are not with ARC  
25 for that work. The contracts are -- there's a

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1 contract between EPRI and -- an agreement between EPRI  
2 and DOE and then a DOE contract for the work which  
3 John Taylor will talk about. But we nevertheless --  
4 those all have to be coordinated together.

5 There are two little blocks in the center  
6 there called "family standardization planning." They  
7 should have been in light ink. They're not really  
8 there yet. They're what we hope to have as a follow-  
9 on as we get along in FOAKE. We hope in a year or so  
10 to establish each one of those which will have some  
11 commercial interest and will be planning for the  
12 follow-on to the FOAKE and to the eventual building of  
13 a plant.

14 In terms of how do we coordinate these,  
15 first we need to know what the big picture is about  
16 the objective status and problems. Now this big  
17 picture about this overall program includes the SBWR  
18 and the System 80. Although they're not in FOAKE,  
19 they're very much in the LWR program and the full  
20 support in review and participation in those programs  
21 is ongoing and will continue to be ongoing, so we have  
22 to have each of these utility bodies and the people  
23 who are working in them to understand how these all  
24 fit together.

25 The interfaces and interactions among

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1 those building blocks are numerous. They're monitored  
2 and encouraged to be in a constructive manner, as are  
3 the schedules. Scheduling meetings between  
4 essentially four different oversight organizations and  
5 trying to keep the travel to a minimum and trying to  
6 keep the repetition to a minimum is our goal. Again,  
7 we share responsibilities with DOE on doing this and  
8 they're a part of this coordination as well.

9 The bottom item that we have, the  
10 integration of foreign and domestic utility one, has  
11 been perhaps one of the most interesting ones. I  
12 would like for you to come and visit one of our  
13 Utility Steering Committee meetings sometime where the  
14 foreign participants take part in it, because they are  
15 very interested. They give very good input and when  
16 you sit in a meeting like that there is enough of them  
17 and different personalities and the different depths  
18 and technical part that it is truly an international  
19 working group. Some of our very best support for the  
20 LWR program is coming from foreign utilities.

21 COMMISSIONER REMICK: Pat, a question that  
22 might be properly addressed to John Taylor. In the  
23 EPRI utility requirement document effort there was  
24 participation by foreign utilities and now in Europe  
25 there is a European requirements document being

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1 developed. Are any U.S. utilities or EPRI  
2 participating in that effort?

3 DOCTOR TAYLOR: Not directly, Forrest. We  
4 have made arrangements that they will be reviewing  
5 their work and will have a chance to comment, but  
6 we're not part of the working group that is developing  
7 that. We're generally aware of what they're doing at  
8 this point.

9 COMMISSIONER REMICK: I see. Okay.

10 MR. McDONALD: All right. Let's talk a  
11 minute about how we do this coordination. Well, it  
12 amounts to the exchange of information in most part,  
13 getting as many people as possible to understand  
14 what's going on and to each have their inputs into it.  
15 We have several of the individual group participants  
16 participate in more than one of those committees that  
17 we have. We have electronic networks.

18 And another thing we have is we have a  
19 series of reports. One of them which we've instituted  
20 is putting out a bi-monthly report from each of the  
21 parties involved. When you count all the parties down  
22 inside some of the blocks, there's a total of about 17  
23 of them, and so we've instituted this where we list  
24 our major problems on our schedule, progress on our  
25 schedules in long-range plans. Getting people to be

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1        forthright in framing their problems is an interesting  
2        challenge, but we're trying to do that, and each of  
3        those 17 people will make the reports to everyone else  
4        and so every one of those 17 parties will have at  
5        least 17 reports to see what's going on on a bi-  
6        monthly basis and then we update those at the meeting.

7                    CHAIRMAN SELIN:    Mr. McDonald?

8                    MR. McDONALD:    Yes?

9                    CHAIRMAN SELIN:    I'd like to go back to  
10       Commissioner Remick's opening remarks and in fact ask  
11       you to not go so heavily into how you manage the  
12       program and the process and talk a little bit more  
13       about what's going to come out of it.    What's the  
14       level of detail?    How does this interact with the  
15       product of the certification process?    Would you see  
16       that the certification of the AP-600 would be any  
17       different from the certification of the small boiling  
18       water reactor, given that one is contracted and one  
19       isn't?    In other words, are you interacting with the  
20       vendors now during the certification process?    How  
21       will you depend on the output of the testing  
22       processes?    Because, the designs are likely to change  
23       during the certification piece.

24                    MR. McDONALD:    May I continue for one more  
25       group and then answer that?

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1 CHAIRMAN SELIN: Of course.

2 MR. McDONALD: Okay. Among all of these  
3 people, I wanted to point out here a technical thing,  
4 that as Executive Director I'm double-hatted. That  
5 makes possible this coordination and I think this is  
6 important for your people to understand when I'm  
7 working with them where I'm coming from. I'm double-  
8 hatted as the Chairman of the Utilities Steering  
9 Committee of EPRI's group, so this makes me more in a  
10 position of a management with respect to the EPRI work  
11 associated with design and some of these other  
12 activities than a coordination hat under ARC, and I  
13 wanted to say that.

14 You have a great number of questions and  
15 let me tell you the topics of discussion. Perhaps  
16 you've reviewed the notes already, but I'd like to  
17 briefly mention them with you.

18 One topic that's talked about is we have  
19 got to get maximum safety and economy benefits out of  
20 the standardization of each design plan. That doesn't  
21 mean that we're trying to standardize the two  
22 different models together. There is some  
23 standardization, but we're counting most heavily upon  
24 the independent family standardization.

25 The second, we believe, and we're working

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1 with your people all the time, that plants in the  
2 standardized family should be more efficient to  
3 regulate and to be regulated. By that I mean they're  
4 not going -- not only should they be easier for you to  
5 manage, but they should be easier to be -- run a plant  
6 and be managed when it's in a family of plants, and  
7 that the plants in a family should be able to make  
8 economical use of cooperative or pooled common support  
9 to handle things that are standardized that don't need  
10 to be done on site, very important. What that means  
11 is it simplifies and can reduce and simplify the  
12 operation of a plant, which is a very challenging  
13 thing to do.

14 And of course we come up to what you  
15 suggested we might want to talk about and I'm only  
16 going to say that people talk about it, what  
17 constitutes predictable licensing and stability and  
18 can the efficiency of regulation be improved with the  
19 more robust plants. We talk about that a lot and work  
20 on it and we have a very good example going right now  
21 on trying to decide some of the issues on the URD.  
22 We've been working very closely together on that and  
23 I think we're doing well.

24 I would like to mention here that we do  
25 need more effective management of the scheduling

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1 interface between each ALWR design and its design  
2 applicant with NRC. I've talked about this with your  
3 staff. We're working on it. I think we can make  
4 great progress in that area. We need to think of that  
5 in some ways as you would think of a plant trying to  
6 run an outage and the outage planning where you have  
7 schedules. You have a certain amount of money and  
8 time and somehow we can manage that interface more  
9 effectively for the overall good.

10 CHAIRMAN SELIN: Are you talking about the  
11 planning of the certification process?

12 MR. McDONALD: No.

13 CHAIRMAN SELIN: Or what happens after  
14 we're finished with certification?

15 MR. McDONALD: Right now all I'm talking  
16 about is the simple interface between the NRC team and  
17 the vendor team who are going down the road toward  
18 certification.

19 CHAIRMAN SELIN: Okay.

20 MR. McDONALD: They each have a schedule  
21 and they have common milestones. In their progress or  
22 problems in meeting each one of those milestones they  
23 have a dialogue to manage those.

24 CHAIRMAN SELIN: Okay. At the expense of  
25 being unnecessarily blunt, what business is that of

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1 the Advanced Reactor Corporation? I mean, that's a  
2 step between the vendor and the NRC. As I understand  
3 it, the Corporation's job is to take the product of  
4 the certification process and carry it to the next  
5 stage of design.

6 MR. McDONALD: Well, that's not right.

7 CHAIRMAN SELIN: Okay.

8 MR. McDONALD: We have a contract with DOE  
9 on FOAKE. We have a contract, DOE, and in a memo of  
10 understanding with EPRI on design certification where  
11 we have money that we put into the design  
12 certification process to get it done. So we have a  
13 very big stake, the utilities do, on having these  
14 things move along in a predictable manner.

15 CHAIRMAN SELIN: The ARC is a funding  
16 mechanism for the certification as well as the --

17 MR. McDONALD: No, no.

18 CHAIRMAN SELIN: So who is "we"? Which  
19 "we" are you talking about?

20 DOCTOR TAYLOR: EPRI.

21 MR. McDONALD: The industry. The  
22 industry.

23 CHAIRMAN SELIN: You're really confusing  
24 me. You're wearing about five hats, not two.

25 DOCTOR TAYLOR: We have a memorandum of

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1 understanding with DOE, not a contract.

2 CHAIRMAN SELIN: Doctor Taylor, every "we"  
3 should be qualified. I was looking at this as an  
4 Advanced Reactor Corporation briefing. I think you're  
5 talking about different groups and I am confused.

6 MR. LONG: Well, remember the only  
7 contract ARC has is with DOE for FOAKE.

8 CHAIRMAN SELIN: Right.

9 MR. LONG: However, NPOC has assigned us  
10 coordination of the other activities even though EPRI  
11 has a contract with the vendors for design  
12 certification. ARC has a coordination activity with  
13 EPRI --

14 CHAIRMAN SELIN: On behalf of NPOC?

15 MR. LONG: Yes.

16 CHAIRMAN SELIN: But from the NRC's point  
17 of view, we see only the vendors. I mean, the vendor  
18 comes in. Whether the vendor is supported by the  
19 utilities or EPRI or DOE or anybody else, our business  
20 is with the vendor.

21 MR. McDONALD: That's right, and I was  
22 very careful in this thing to say that the better  
23 management between the ALWR design certification  
24 applicant and the NRC is needed. I was very careful  
25 to say that.

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1           Now we're interested because we have the  
2 design schedules interfaced. We have our resources  
3 going into those. We have the FOAKE on top of that.  
4 And so, whatever happens in those two-track designs,  
5 the vendors and NRC, affects the industry's overall  
6 plan to gain the end product and to do it with an  
7 identified amount of resources.

8           CHAIRMAN SELIN: Okay. I would like to  
9 make a point at this point. I'm not so much concerned  
10 about the evolutionary reactors because the  
11 certification process is pretty far along, even though  
12 ARC has a contract with the one and not the other.  
13 There are still some uncertainties, but I think those  
14 are measured in weeks, maybe months at the most. And  
15 in addition, the NRC work is based on design  
16 documents. But when you get to the passive reactors,  
17 the small reactors, there's an extensive test program.  
18 There's an extensive demonstration program.

19           I'll give you some friendly advice and  
20 then I'll make a statement on behalf of the  
21 Commission. The friendly advice is don't get too  
22 contingent on meeting any particular design objectives  
23 in either schedule or design, because both of those  
24 are likely to change. Presumably, all the money  
25 that's being spent on these tests, particularly for

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1 the AP-600 since that's less of an extrapolation and  
2 more some new work, it's going to change the design  
3 and it's going to change the certification.

4 And the policy statement, I'll just say  
5 very bluntly the NRC will not try to meet a DOE  
6 schedule, an ARC schedule or a vendor schedule. We're  
7 going to do the best we can to certify those small  
8 reactors based on the safety information that we have,  
9 but, if there are changes either because the designs  
10 are imperfect or because the experimental work turns  
11 up changes, we're going to change. It would be very  
12 foolish to either have a lot of money expended that  
13 turned out to have been spent prematurely because the  
14 design took a left turn or to try to "coordinate" with  
15 us to try to get us to meet some schedules that can't  
16 be met based on the facts.

17 MR. McDONALD: Mr. Chairman, you hit on a  
18 subject which you wanted to discuss. Let me respond  
19 to you.

20 We have a similar activity that goes on  
21 today once or twice a year for almost every company  
22 that runs a nuclear plant. It's called an outage,  
23 refueling outage. Each of those companies have a  
24 budget to meet. Your organization has requirements to  
25 monitor what's going on. They set out and they sit

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1 down and they do what's called an "optimum schedule"  
2 for how long it's going to take. They have numerous  
3 parties involved, many of the same people who are  
4 working here. They set out a timeframe and then they  
5 start trying to manage that overall project. They  
6 don't manage any organization except their own, but  
7 they coordinate the various vendors and other  
8 activities that go along with that, and they have to  
9 have some overall object to go to and they have to  
10 jointly work together on the schedule in order to ever  
11 have it contained.

12 What I am suggesting here on this whole  
13 effort, including the passive AP-600, is that we have  
14 to have our schedules, our individual organization  
15 resource schedules and the vendors, and we have to  
16 check the common milestones and we have to work to see  
17 how we can make those milestones.

18 You're advising us not to get too far  
19 ahead and that's good advice, because we too are  
20 following these test programs as I described before.  
21 We're checking the progress. We see where we have  
22 problems already, but we must try to contain this and  
23 have an end point and have general agreement to where  
24 we're going every step of the way or we will lose our  
25 backing in terms of financial support and we will lose

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1 the strength of the intention that we're going to get  
2 there. And so everything you say is well and good,  
3 but we must press on and we must have definitions that  
4 we're working for.

5 COMMISSIONER de PLANQUE: Pat, what do you  
6 see as the root of the problem here? Is it a  
7 communication problem or what's behind this?

8 MR. McDONALD: Well, I think I talked  
9 about the root of the problem. I don't think -- I  
10 think the words can be summed up right here in this  
11 one little word that I gave you, "more effective  
12 management schedule interface between each design."

13 I heard the -- you know, in an outage you  
14 work it day by day, but this is something we can  
15 probably work week by week. If two parties are  
16 generally working together and they're trying to match  
17 each of their resources and all of a sudden one of  
18 them comes up one day and says, "Hey, I've got to tell  
19 you I'm going to be two months late getting this to  
20 you," then you end up making inefficient resources on  
21 both sides of that scheduling interface. And that  
22 does not mean that one is trying to manage the other.  
23 It means that they are communicating as they go along.  
24 They're trying to manage the problems that each of  
25 them incur and the effect that it has on each other.

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1                   This is a more difficult one, because we  
2                   have four different vendors who are in this design  
3                   process and we have to realize some overall  
4                   coordination as well. So all I'm talking about is  
5                   maintaining individual management integrity and  
6                   command, but working on that interface on schedules,  
7                   and we do not have a pattern right now. We don't have  
8                   a concept of that close schedule interactions so that  
9                   we track real time with each other so each party can  
10                  monitor and adjust its resources.

11                 CHAIRMAN SELIN: Mr. McDonald, I need to  
12                 tell you two things. Number one is, I flat-out don't  
13                 agree with that paragraph.

14                 MR. McDONALD: I'm sorry, I didn't hear  
15                 you.

16                 CHAIRMAN SELIN: I flat-out do not agree  
17                 with that paragraph. In the case of the evolutionary  
18                 reactors, we have very good communication with one of  
19                 the vendors and we have very poor communications with  
20                 the other one of the vendors in terms of surprises, so  
21                 I just think that's too --

22                 MR. McDONALD: So this is a two-sided  
23                 fence and I agree with you entirely. This is not  
24                 aimed at NRC. It's aimed at both sides of that  
25                 interface.

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1 CHAIRMAN SELIN: But it's not that we do  
2 or don't need better communication. In one case, the  
3 communications are pretty good. There haven't been  
4 many surprises. In one case there have been a lot of  
5 surprises.

6 In terms of the small reactors, the so-  
7 called "passive reactors," it's really too early. I  
8 mean, there have been some miscommunications, but the  
9 big problem isn't what we know is going on and what  
10 the vendors know. It's very early in the  
11 certification process and there are going to be huge  
12 surprises. I mean, it's almost inevitable.

13 I'm not going to debate with you on these  
14 points. I'm saying some things. I hope you listen to  
15 them, because otherwise next year there could be some  
16 embarrassing miscommunications.

17 MR. McDONALD: Okay. What I'm trying to  
18 say now is we should have as our goal that we don't  
19 have any embarrassing miscommunications. And the only  
20 way we can do that with schedules is to have a  
21 management attention given to those schedules so we  
22 each know where we stand at any one time. We don't  
23 have that set up yet.

24 CHAIRMAN SELIN: I doubt very much that  
25 the Commission could spend any more attention on the

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1 schedules and still function. It's a question of the  
2 very highest priority.

3 MR. McDONALD: But the Commission isn't  
4 the one that needs to spend it. It's down through the  
5 organization at the working levels. It's our  
6 management responsibility and the vendors and ARC and  
7 everyone else to make sure that we have that  
8 infrastructure that's communicating on at least a  
9 weekly basis of where everybody is and where we're  
10 going and not to have any surprises come on either  
11 side of that interface.

12 CHAIRMAN SELIN: Why don't you continue  
13 with your presentation?

14 DOCTOR TAYLOR: I just had one point. The  
15 utilities I believe have the same interest you do in  
16 the sense of the testing program providing the full  
17 validation of these systems. They don't intend to get  
18 into a situation where the plant itself is going to be  
19 the test vehicle.

20 As an example, just last week, Pat,  
21 myself, DOE met with Westinghouse to discuss some  
22 expansion of their test program. Now we know there's  
23 potential schedule implications to that, but we'll  
24 accept that in the interest of getting a system which  
25 utilities are not holding the bag of a lot of

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1 technical uncertainties.

2 CHAIRMAN SELIN: We have nothing to say  
3 about the interaction between the various utility  
4 organizations and the vendors. That's truly your  
5 business. But when you start getting into something  
6 which I could crudely and probably somewhat unfairly  
7 characterize as trying to manage the NRC schedule,  
8 which is not what Mr. McDonald said, but close to it,  
9 then we do have an interest.

10 There are going to be some real surprises  
11 on the AP-600 and, you know, developing a reactor is  
12 a little more of a research activity than an outage,  
13 although not as much more as I would have thought  
14 before I got into this business.

15 MR. McDONALD: But, Mr. Chairman, you  
16 said, again, managing NRC's business. In no way, in  
17 no stretch of the imagination are we even suggesting  
18 that. All we're suggesting is the simple thing that  
19 happens between any two parties that are working  
20 together for common steps and goals. That's all.

21 CHAIRMAN SELIN: Okay. Fair enough.

22 Why don't you continue?

23 MR. McDONALD: Okay. Well we really got  
24 hung up on that, but I think it was a necessary  
25 exchange because we need to clear the air on this I

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1 think.

2 Let me go on a minute and point some other  
3 points here that in their time could be as significant  
4 as schedule.

5 We were wondering how we assure that the  
6 updated and sophisticated techniques used in  
7 construction by some of the Asian plants will be  
8 available to us in the United States. We're concerned  
9 about that because we don't have ongoing construction  
10 to exercise those.

11 We're also looking and working on the best  
12 approach for identifying the essence of models, the  
13 essence of something you call a standard or a model  
14 for the best processes, procedures and organizations  
15 and other functional standards which we need to adopt  
16 for standardizations, and Zack Pate will talk about  
17 that.

18 We need an adequate information management  
19 system for use through the entire scope of designs,  
20 construction, start-up, and operation. I only spoke  
21 this morning to a part of that, and that is the part  
22 that's used in the IMS part. We need a part that will  
23 continue through construction, the procurement,  
24 construction and operation, which we don't have that  
25 type of a recognized IMS system at this time.

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1 With that --

2 COMMISSIONER ROGERS: Are you talking  
3 there about engineering design information as well?  
4 I mean, are you talking about --

5 MR. McDONALD: Yes, that can capture all  
6 the data and all the processes in it.

7 COMMISSIONER ROGERS: -- detailed  
8 designs --

9 MR. McDONALD: Yes.

10 COMMISSIONER ROGERS: -- that can be  
11 exchanged electronically?

12 MR. McDONALD: Yes.

13 COMMISSIONER ROGERS: Where do you stand  
14 on that? How far are you?

15 MR. McDONALD: Okay. Now let me repeat  
16 what we have in the FOAKE. Part of the FOAKE program  
17 is to have each vendor have an adequate IMS system so  
18 that all that is captured, the design basis and all  
19 that, and then we require him by contract to be able  
20 to put that in a neutral file, a neutral file that  
21 doesn't have an IBM or some other label on it, so that  
22 we can then take it out of that file and it will be  
23 fully useable in a fully developed IMS system.

24 COMMISSIONER ROGERS: Now where does that  
25 stand? I mean, how far --

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1 MR. McDONALD: Well, we've reviewed the  
2 IMS program from both GE point of view and  
3 Westinghouse point of view and they seem to be in  
4 pretty good shape on both of those. For the overall  
5 long-term, that's a challenge still ahead of us.

6 COMMISSIONER ROGERS: Well, have they been  
7 able to create these neutral files?

8 MR. McDONALD: Both of them think and we  
9 think, and we had a contract to explore that, we had  
10 a contractor -- who was the contractor on that one,  
11 John? Was it Sergeant-Lundy?

12 DOCTOR TAYLOR: Yes.

13 MR. McDONALD: We had a contractor in  
14 phase two of our program. We had a contractor  
15 identify a neutral file capability for us.

16 COMMISSIONER ROGERS: And to what extent  
17 have the NRC staff been in the loop on being able to  
18 access that neutral file? After all, one of the  
19 purposes, I would think, would be to be able to  
20 communicate that kind of information to NRC as well,  
21 not simply back and forth within ARC.

22 MR. McDONALD: Well, this is a recognized  
23 type of a file that many different companies and  
24 organizations can access. That's why it's neutral.  
25 So if you have a system --

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1 COMMISSIONER ROGERS: No, I understand  
2 what the purpose of it is. My question now is where  
3 does NRC staff stand with respect to being capable,  
4 able to access that?

5 MR. McDONALD: I don't know. I'll find  
6 that out and let you know.

7 COMMISSIONER ROGERS: Is that part of your  
8 thinking here, that the NRC staff should be able to  
9 have access in some --

10 MR. McDONALD: I have to admit I have not  
11 heard that discussed.

12 DOCTOR TAYLOR: We have not approached  
13 that at this time.

14 One of the issues that will have to be  
15 worked out, and it can be, is that there will be a lot  
16 of proprietary data, one design versus another, and so  
17 arrangements would have to be made with NRC to  
18 recognize that.

19 COMMISSIONER ROGERS: Well, we deal  
20 with --

21 DOCTOR TAYLOR: You've done that before,  
22 so it can be worked out.

23 COMMISSIONER ROGERS: I mean, that's not  
24 brand new.

25 DOCTOR TAYLOR: But we have not yet

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1 addressed that, Commissioner.

2 COMMISSIONER ROGERS: That might be  
3 helpful in setting up such an interface. I don't  
4 know, but one would imagine that in the long run it  
5 certainly would. I don't know how important it is  
6 right now in being able to proceed, but I would think  
7 that that would be an important area for you to  
8 discuss with NRC staff, to what extent they can have  
9 access to files that might make it easier for them to  
10 proceed along with their work.

11 DOCTOR TAYLOR: Well, we'll undertake to  
12 open that discussion.

13 MR. McDONALD: John, would you continue?

14 DOCTOR TAYLOR: Yes, sir.

15 With the limited time, I'm going to go  
16 fast. I just wanted to remind ourselves of our  
17 initial vision, which was to create a foundation for  
18 better plans with real emphasis on simplicity, more  
19 rugged systems based on proven technology.

20 The outcome ten years ago of a detailed  
21 survey where we went from plant to plant and talked to  
22 the operators, what they thought about the future was,  
23 "This light water technology is okay, but these plants  
24 are harder to run and to maintain than they really  
25 should be. Please make them simpler and easier."

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1           So to make that happen we set out to  
2       establish utility requirements the designer would  
3       utilize in the design of the LWRs injecting 25 years  
4       of utility operating experience with utility people  
5       who had that experience, and we've come a long way in  
6       that respect. Of course, it's senseless to establish  
7       a bunch of requirements that in any way would conflict  
8       with NRC's regulations, needs, and perspectives, so  
9       from the beginning you were cooperative with us in  
10      setting up formal reviews of those requirements to  
11      assure that there would be no conflict.

12           Now we've often been at this table  
13      seemingly complaining about this or that and we've  
14      talked about schedule problems. I just want to, and  
15      I'm going to do it quickly, say we've made one hell of  
16      a lot of progress and we owe NRC staff compliments for  
17      the hard work they've done, the designers for the hard  
18      work they've done, and the utilities for the hard work  
19      they've done for that.

20           This program has expanded to cover a newer  
21      system, the passive reactors. The DOE has put  
22      tremendous support into it, more than we ever would  
23      have thought, and the international utilities, both  
24      finances and the key technical people with excellent  
25      experience.

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1                   And we've come a long way to resolve the  
2 regulatory issues, moved into design certification and  
3 first-of-a-kind engineering and you'll hear from  
4 NUMARC and INPO on their support in the  
5 standardization process where we look on the  
6 requirements as a first step in standardization in  
7 that the utilities are not individually asking for  
8 something different but have a common view on what  
9 they want. Then the Nuclear Power Oversight Committee  
10 brought this program to a large whole by developing a  
11 strategic plan which includes more than just this  
12 technical work we're doing.

13                   Well, specifically, the requirement  
14 documentation is in place now. The FSERs have been  
15 prepared by the NRC staff and we've been using them  
16 and of course continue to use them as a basis for the  
17 design certification of the first-of-a-kind  
18 engineering work. We have had the use of those  
19 requirements already in the Taipower bid spec. Many,  
20 many of those requirements have been incorporated in  
21 that spec, not all of them. And, as you mentioned  
22 earlier, Commissioner Remick, the Europeans have  
23 decided to develop their requirements. Certainly a  
24 large amount of what we've done they've been involved  
25 in will be utilized there.

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1                   We're happy that a lot of very contentious  
2                   and difficult issues have been closed where we've had  
3                   to change and I think NRC has listened to some of our  
4                   argumentation and they've made some changes too, so  
5                   it's been a fruitful closure.

6                   In spite of our concern about schedule,  
7                   we're still making substantial progress in design  
8                   certification. And, Chairman, in the EPRI element of  
9                   the program we're following all four designs, not just  
10                  the two that are in the first-of-a-kind engineering,  
11                  because those other two designs are still of potential  
12                  significant importance to the utilities. The reason  
13                  they're not being sponsored in first-of-a-kind  
14                  engineering is simple. It's the money, monies that  
15                  available.

16                  But we have a lot of work ahead. We are  
17                  following the design certification and the first-of-a-  
18                  kind engineering work to assure that we continue as we  
19                  get into detail maintained conformance with the  
20                  requirements. We have a few issues yet to close out  
21                  in finalizing the -- as NRC finalizes the FSERs, and  
22                  we must keep the URD up to date. These possible  
23                  changes, Chairman, you mention might reflect on some  
24                  inadequacy in the URD. When that shows up, we've got  
25                  to step up to the bar and make an appropriate change

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1 working with the staff so that they are fully  
2 satisfied with such a change.

3 And then of course the big goals ahead are  
4 getting that final design approval and the  
5 certification from NRC and completing the first-of-a-  
6 kind engineering.

7 CHAIRMAN SELIN: Would you stop for a  
8 second, Doctor Taylor?

9 DOCTOR TAYLOR: Yes, sir.

10 CHAIRMAN SELIN: The question I had  
11 originally asked could be rephrased as what  
12 constitutes the completion of first-of-a-kind  
13 engineering? In other words, what do you expect to  
14 have in reasonably concrete terms? "You" being as  
15 vague as I complained the "we" was.

16 DOCTOR TAYLOR: Well, we'll have a design  
17 of the entire plant. It includes all the balance of  
18 plant, the switch yard side, et cetera. That has to  
19 be done. It will be carried out up to the point that  
20 in order to get further detail you'd have to enter  
21 into a procurement contract, except for six or seven  
22 components such as the reactor vessel where you don't  
23 really know where you stand for sure until you've done  
24 that. That will entail additional funds, money being  
25 spent with prospective vessel manufacturers and so on

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1 to get that detail.

2 CHAIRMAN SELIN: I missed a point. At the  
3 end of the first-of-a-kind engineering, except for six  
4 or seven components, you'll meet the --

5 DOCTOR TAYLOR: We'll have the system  
6 designs completed.

7 CHAIRMAN SELIN: Right.

8 DOCTOR TAYLOR: We'll have form, function  
9 specifications for all the subsystem components with  
10 which a procurement step could be taken and, because  
11 we have the form, fit, function of those components,  
12 a reasonable basis for the cost which would be  
13 entailed in procuring them and the cost which would be  
14 entailed in installing them.

15 CHAIRMAN SELIN: Except for the pressure  
16 vessel, which will be in what status?

17 DOCTOR TAYLOR: We'd in effect be engaged  
18 in work with the manufacturer to get all the details  
19 of a specific pressure vessel design. It's so key --

20 CHAIRMAN SELIN: So that would be in more  
21 detail that produced at that point?

22 DOCTOR TAYLOR: Yes.

23 MR. LONG: Reactor coolant pumps,  
24 pressurizer, et cetera.

25 CHAIRMAN SELIN: Okay. And you said that

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1 you would be as far as you could get without having  
2 run a procurement, but --

3 DOCTOR TAYLOR: And without a specific  
4 site, which would entail adjustments where the envelop  
5 that we've established in the requirements document to  
6 cover as many sites as possible wasn't quite  
7 sufficient. There would have to be adjustments for  
8 that.

9 CHAIRMAN SELIN: Let me take a specific  
10 case. In the case of the large advanced boiling water  
11 reactor, would there be anything beyond paper? Would  
12 there be models or prototypes of anything? What would  
13 the form of this full design be? Is it entirely a  
14 paper design?

15 DOCTOR TAYLOR: Certainly there will be  
16 models. Now models in the more modern sense with the  
17 3-D graphic capability that exists, you can have the  
18 much better equivalent of a model. We'll have very  
19 great detail, layouts of piping systems, et cetera and  
20 so forth through that capability, something even  
21 today's models couldn't even do well.

22 CHAIRMAN SELIN: Would you expect any  
23 confirmatory testing as part of --

24 DOCTOR TAYLOR: Confirmatory testing on  
25 the passive safety features, absolutely essential.

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1 CHAIRMAN SELIN: I'm sorry. I'm still  
2 with the large boiling water reactor.

3 DOCTOR TAYLOR: The large boiling water  
4 reactors and the power package of the passive systems  
5 is of conventional known technology. In fact, in  
6 order to provide the thermal margins that the  
7 requirements documents pull out, it is less of a  
8 challenge to the existing technology than otherwise  
9 would occur. So we don't see the need for  
10 confirmatory testing on any of that portion of the  
11 system.

12 But the passive safety features, very  
13 essential to get that testing and make sure that the  
14 plant is designed from that standpoint in the proper  
15 way.

16 COMMISSIONER REMICK: Things like fine  
17 motion control rods, internal pumps would already have  
18 been tested.

19 DOCTOR TAYLOR: They've been tested, yes.  
20 They've been tested.

21 CHAIRMAN SELIN: As you are aware, the  
22 Commission is planning a certain amount of  
23 confirmatory testing on the AP-600. Is there any  
24 connection between what we're planning on doing and  
25 what you're planning as far as confirmatory testing?

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1 DOCTOR TAYLOR: There's no disagreement to  
2 my knowledge at all. In fact, as we pursue the  
3 program, we'll be finding additional things that need  
4 to be done and we'll be sharing that thinking with NRC  
5 and I'm sure they'll find some things they want to be  
6 done too.

7 CHAIRMAN SELIN: So you -- I'm not sure  
8 which "you" it is, whether it's ARC or EPRI, but  
9 somebody on the industry side will be running a  
10 parallel confirmatory testing program with ours?

11 DOCTOR TAYLOR: We are working closely  
12 with the vendors and, in many cases, our international  
13 associates to get that testing done. In many cases  
14 they are providing the funding through which the  
15 testing is done, but we have helped to arrange through  
16 the international participation we have to get that  
17 testing completed.

18 CHAIRMAN SELIN: I'll try to follow-up on  
19 this off-line. I'd be very interested in looking at  
20 a time line and saying, "On the AP-600, here's what  
21 the NRC plans to do for confirmatory testing. Here's  
22 what either the vendor or EPRI or some utility  
23 representative plans on doing." That would be a very  
24 interesting topic, but I won't take --

25 DOCTOR TAYLOR: We would be very pleased

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1 to provide that information to you, sir.

2 CHAIRMAN SELIN: Thank you.

3 DOCTOR TAYLOR: We're very pleased for the  
4 question too.

5 MR. LONG: One other thing too. You'd  
6 asked I think for some more concreteness on what's  
7 FOAKE. We do have a specific list of deliverables.  
8 We've taken the words that John has said about  
9 generally what it is to actually list out what we  
10 expect out of each one of the vendors and we'd be glad  
11 to share that also with you.

12 DOCTOR TAYLOR: We could furnish that to  
13 the Chairman too, if you wish.

14 CHAIRMAN SELIN: Thank you.

15 COMMISSIONER ROGERS: What about software  
16 reliability and issues relating to digital system  
17 instrumentation and controls? What kind of  
18 equivalents to testing to you contemplate there?

19 DOCTOR TAYLOR: Equivalent detection, did  
20 you say?

21 COMMISSIONER ROGERS: No, equivalents to  
22 testing. I'm not saying necessarily one has a piece  
23 of hardware that one tests, but what would be the  
24 verification and validation procedures that you  
25 contemplate for digital I&C systems and the control

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1 room?

2 DOCTOR TAYLOR: What we see with the I&C  
3 systems and control room systems is the utilization of  
4 highly proven technology so that components themselves  
5 in our judgement don't need the testing. What is  
6 needed is assurance that in the integrated form they  
7 operate as they should, which would involve simulator  
8 work which we were hoping will be carried out to  
9 verify the design. But the biggest challenge is the  
10 V&V of those systems.

11 COMMISSIONER ROGERS: Correct.

12 DOCTOR TAYLOR: A very, very thorough V&V  
13 program that assures that small bugs cannot upset the  
14 entire affair, and that's been a subject of intense  
15 discussion between ourselves and NRC.

16 COMMISSIONER ROGERS: Well, I know it has.  
17 I had just a question of where does it stand, in your  
18 view? To what extent do you feel you've come to or  
19 are at a meeting of the minds there?

20 DOCTOR TAYLOR: Well, we haven't reached  
21 a meeting of the minds, Commissioner, at this time,  
22 but through the dialogue that has occurred I think we  
23 see each other's viewpoints and I see some movement  
24 toward closure there.

25 CHAIRMAN SELIN: Doctor Taylor, I'd like

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1 to follow-up on Commissioner Rogers' excellent  
2 question. At the time of design certification, we  
3 don't expect a design of the software. We expect a  
4 detailed specification, a so-called -- you know, the  
5 functional specifications of the design acceptance  
6 criteria.

7 Would you expect any of the software to be  
8 written during the first-of-a-kind engineering phase  
9 or would that all be left to be written after an order  
10 were actually placed for the system?

11 MR. McDONALD: I don't know that. I don't  
12 know that, John.

13 DOCTOR TAYLOR: Well, I'm not an expert,  
14 so I can give you just a broad statement on that. The  
15 evolutionary designs have a vast amount of software  
16 completed. The question would be, are there some  
17 adaptations necessary because that work has been done  
18 in support of, say, the ABWR, the Japanese program at  
19 this time? There would probably have to be some  
20 modifications, but I don't consider them myself to be  
21 large ones.

22 CHAIRMAN SELIN: Actually, it's a very  
23 interesting process. What the vendors have done is  
24 they've taken their software, they've gone back and  
25 said "What are the specifications that would have led

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1 to this software?" In some cases they changed them.  
2 They submitted the specifications to us to see if they  
3 meet our objectives and they hope that the software  
4 will still meet those objectives, but those will have  
5 to be tested and proved, but not as part of the design  
6 certification process because we expect the software  
7 to be rewritten during the lifetime of the system  
8 without having to go back and change the  
9 certification.

10 My question is, in the next stage in your  
11 100 percent design, how do you expect to control the  
12 software? Do you expect, as part of accepting the  
13 first-of-a-kind engineering, to actually have code  
14 that can be tested? It's not necessarily a question  
15 that needs to be answered now, but it's an important  
16 part of what you're trying to --

17 DOCTOR TAYLOR: Yes. Again, I'll make a  
18 broader statement and then we can follow-up from  
19 there. The experience that has been achieved in the  
20 evolutionary design in heavy measure is and will be  
21 applied to the passive plants. To expect that they'll  
22 be at the same level of maturity at the same stage is  
23 probably asking for too much, so there will be a  
24 similar situation where there is provision for  
25 completion and adjustment as time goes on, but we

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1 certainly want to know enough that we can have a  
2 sensible, dependable cost estimate of this plant.

3 COMMISSIONER ROGERS: Well, I guess the  
4 question I was driving towards and the Chairman really  
5 got into it quite correctly is just one can visualize  
6 first-of-a-kind engineering when you're talking about  
7 hardware, and that's not hard to understand how you  
8 would do a certain level of engineering up to the  
9 point where the only way that to specify anything more  
10 precisely would be to actually get a bid back from a  
11 vendor and it's easy to see how that whole process  
12 might take place.

13 I find it a little bit more difficult when  
14 you're talking about software systems that may or may  
15 not be totally written. It seems to me that it's very  
16 likely a different kind of process that you have to  
17 contemplate when you're talking about first-of-a-kind  
18 engineering for software versus hardware and it's  
19 really what your thinking is on that question, whether  
20 you don't see a difference or whether you do see a  
21 significant difference.

22 DOCTOR TAYLOR: A difference --

23 COMMISSIONER ROGERS: Between how one  
24 would decide the end point of first-of-a-kind  
25 engineering for hardware versus software systems.

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1 DOCTOR TAYLOR: My own judgement is the  
2 software will have progressed further than the  
3 hardware, because the same issues of needing to get a  
4 contract for procurement are not as strong so that the  
5 software will progress further. There will be  
6 simulation work done to have a much better idea of  
7 what that software content will be in terms of the  
8 operation of these systems.

9 COMMISSIONER ROGERS: Well, I mean, my  
10 intuitive feeling, it would be just the opposite, but  
11 you may be absolutely right. So there's something I  
12 don't quite understand here, because to me the  
13 questions about software are much more subtle than the  
14 questions about what hardware is going to look -- you  
15 know, what the specs are going to be on a piece of  
16 hardware.

17 DOCTOR TAYLOR: Yes, and when you get to  
18 the V&V, as I said, that's the biggest challenge of  
19 all, of developing a system of V&V which can be  
20 utilized with what is defined and can be utilized  
21 further as changes are made and further developments  
22 occur and to be satisfactory to us and to you as an  
23 effective V&V method.

24 COMMISSIONER ROGERS: Well, I think I'll  
25 drop it now because I think it could lead us into too

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1 long a discussion for our meeting this morning, but I  
2 do see it as not the same, a qualitatively different  
3 kind of problem of software versus hardware.

4 DOCTOR TAYLOR: It is different. I'm  
5 suggesting perhaps that we will be at a greater level  
6 of definition in that area because of its importance.

7 COMMISSIONER ROGERS: Well, that would be  
8 nice if it comes out that way.

9 MR. COLVIN: May I just make one comment,  
10 Commissioner Rogers, perhaps to put this in a little  
11 different perspective and assist in the understanding?  
12 I think that, if we look at the design certification  
13 package and we split up the design certification into  
14 tier 1 and tier 2, then we have to develop the  
15 inspections, tests, analyses, and acceptance criteria  
16 that will come out of that design as in accordance  
17 with the rule. There are going to be elements of  
18 those ITAAC that affect the software, as you're  
19 indicating.

20 The next step in that process in  
21 completing the first-of-a-kind engineering would not  
22 necessarily lead to the completion of the software,  
23 because that would be something that would have to be  
24 completed in some cases at COL and in some cases  
25 through the construction and tested in accordance with

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1 the ITAAC. So I think what we're going to see is a  
2 mix, depending upon the system and the level of the  
3 detail and the level of significance of that software  
4 as it applies to the design.

5 CHAIRMAN SELIN: Thank you.

6 MR. McDONALD: Doctor Pate.

7 DOCTOR PATE: Mr. Chairman, Commissioners,  
8 I am Zack Pate, President and Chief Executive of the  
9 Institute of Nuclear Power Operations. I will briefly  
10 describe the industry's long-range strategy for life  
11 cycle standardization.

12 The strategic plan, the NPOC strategic  
13 plan, assigns primary responsibility for building  
14 block 7 to the utilities and the industry lead to  
15 INPO. A position paper on standardization was  
16 developed after the strategic plan was initially  
17 issued. The position paper represents a strong  
18 industry commitment to life cycle standardization and  
19 this position paper has now been made an integral part  
20 of the strategic plan.

21 What I'll do now is describe six  
22 underlying principles for standardization that are in  
23 the plan and INPO's role in assisting utilities in  
24 implementing these principles. The six principles are  
25 important enough to standardization that I think

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1 they're worth going through in some detail.

2           The first principle is that the ability to  
3 standardize practices related to operational  
4 performance, reliability and efficiency is dependant  
5 on a strict adherence to maintaining life cycle  
6 standardization among all plants in a family. We  
7 recognize that standardization among plants in a  
8 family cannot be allowed to erode or slip away.  
9 Indeed, those experienced in this area, such as  
10 Callaway and Wolf Creek or such as Byron or Braidwood  
11 and including Electricite de France, have told us  
12 repeatedly that once the elements of standardization  
13 are lost they are very difficult to restore.

14           The second principle is that the industry  
15 development source documents already exist that relate  
16 to standardized nuclear plant operation. Documents  
17 such as INPO performance objectives and criteria as  
18 well as many other selected industry guidelines  
19 provide an up to date framework for development of  
20 standardized approaches for new plants. These  
21 documents are in use today. The guidance in these  
22 publications contains a field tested basis for  
23 establishing many of the standardized practices for  
24 new plants.

25           The third principle is that the processes

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1 or practices important to operational performance, to  
2 plant configuration management, to efficiency and to  
3 economy of scale are consistent, that is standardized  
4 among all plants in a family. And by this we mean  
5 that all plants will have common procedures, practices  
6 and training and other such measures in every area  
7 important to achieving the benefits of  
8 standardization.

9 The fourth principle, changes to  
10 standardize elements of the organizational structure,  
11 administrative controls and operating practices and  
12 procedures or to the plant configuration that provide  
13 a clear benefit will be implemented uniformly at all  
14 plants in the family. Over the life of these plants,  
15 changes that will significantly enhance their  
16 performance will be needed. Once carefully reviewed  
17 and approved by all the owners, they will be  
18 implemented at all plants in the family to preserve  
19 standardization.

20 The fifth principle is that life cycle  
21 standardization will be implemented in such a way as  
22 to strengthen line management's ability to establish  
23 priorities and direct plant activities on matters  
24 affecting safety, operational performance, reliability  
25 and efficiency. Promptly selecting and implementing

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1 standard procedures will free line managers from  
2 burdensome administrative tasks and allow them to  
3 focus their attention on the more important management  
4 and operational issues.

5 And then the sixth and final principle is  
6 that life cycle standardization will accelerate the  
7 learning process through the sharing of operating  
8 experience, also the better identification of root  
9 causes. Standardized plants greatly enhance the  
10 ability to share operating experience and, unlike  
11 today where every plant is unique, the lessons learned  
12 at a standardized plant will clearly apply to all  
13 plants in the family.

14 INPO has several challenges important to  
15 the implementation of standardization and adherence to  
16 these principles and I'll briefly go through some of  
17 these key activities.

18 One, to coordinate interactions among  
19 utilities, suppliers and potential consortiums that  
20 may own new plants as these activities relate to  
21 standardization.

22 The second INPO role is to act as a  
23 catalyst to establish the necessary agreements among  
24 utilities or other entities that will own and operate  
25 a family of plants.

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1           A third role is to ensure that operational  
2           experience of current nuclear plants is incorporated  
3           into the new plant designs, training, operations and  
4           procedures.

5           The next role is to draft standard  
6           policies and procedures with utility input. Let me  
7           give two examples of how this will work. First, the  
8           operating procedures will be identical at each plant  
9           of a family. These cannot, of course, be the same for  
10          a different design or for different families, but, on  
11          the other hand, the procedures to safety isolate  
12          mechanical and electrical equipment for maintenance,  
13          the so called tag-out or clearance procedures, should  
14          be the same not only at each plant of a family but  
15          also for every new family.

16          As a final INPO role, since  
17          standardization enhances safety, we expect that INPO  
18          will perform appropriate monitoring, perhaps as part  
19          of our ongoing evaluation program, to see that  
20          standardization is indeed maintained as planned.

21          This has been a brief summary of long-  
22          range strategy and a summary of INPO's role, Mr.  
23          Chairman, and that concludes my remarks.

24                 CHAIRMAN SELIN: Mr. Pate, I know this is  
25          sort of speculative since it's, as I've tried to say

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1 before, quite far ahead, but would you see another  
2 element in your evaluations of reactors to be a  
3 standardization evaluation which of course goes beyond  
4 the particular reactor? In other words, when you look  
5 at reactors to see how are the operations going  
6 compared to what's expected at this particular plant,  
7 if you had half a dozen of a family, would you expect  
8 an evaluation of whether a given reactor at a given  
9 site was getting pretty far off the common model?  
10 Would you expect that the evaluation would include how  
11 standard it is kept as well as how safe and how  
12 efficient it is kept?

13 DOCTOR PATE: My own sense, Mr. Chairman,  
14 is that we will end up in exactly that role.

15 CHAIRMAN SELIN: That's very interesting.

16 COMMISSIONER ROGERS: Just with respect to  
17 the common operating procedures of standardization,  
18 would you actually envision sufficient standardization  
19 that an operator from one plant could simply walk into  
20 another plant and start to function without any  
21 additional training? This the same kind now. I mean  
22 the same family.

23 DOCTOR PATE: Yes. I think for a plant  
24 within the same family, my expectation would be that  
25 all the operator would need to learn or be trained on

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1 is site-specific differences that might result from  
2 one plant being on a river and another plant being on  
3 the ocean, that kind of thing.

4 CHAIRMAN SELIN: Mr. Colvin, you may think  
5 that these questions were designed to keep you from  
6 telling us what you expect of our regulatory  
7 environment, but that would be a completely unfair  
8 assumption.

9 MR. COLVIN: Yes, sir. I appreciate your  
10 kindness in that regard.

11 DOCTOR PATE: Excuse me one second, Joe.

12 Mr. Chairman, in a few minutes, probably  
13 before he finishes his presentation, may I be excused  
14 to make another commitment?

15 CHAIRMAN SELIN: Of course.

16 MR. COLVIN: In that regard, I will try to  
17 be extra brief.

18 Mr. Chairman, Commissioners, as you know,  
19 NUMARC has been addressing the generic regulatory  
20 matters associated with the building blocks within the  
21 NPOC strategic plan and in particular we're supporting  
22 the ARC activities on behalf of all the utilities as  
23 well as all the designs from the regulatory  
24 standpoint, because we are desirous of trying to  
25 capture the lessons learned from each of those

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1 activities and provide that benefit in the future  
2 designs.

3 (Slide) In particular, the activities  
4 that we're undertaking are shown on this viewgraph.  
5 One of those may be new to the Commission and that is  
6 that we're working very closely with INPO and EPRI and  
7 ARC on trying to figure out, out of the effort that  
8 INPO takes in designing what's desired by the  
9 utilities in the life cycle standardization area, how  
10 to bring that forth to the Commission on behalf of the  
11 industry in the area of regulatory credit for those  
12 activities.

13 Through the efforts with the Commission  
14 and with the staff, I think you've been aware that  
15 we've had a standardization oversight working group  
16 probably nigh on for seven or eight years working on  
17 this activity with the Commission with the primary  
18 focus of working on Part 52 and the various and sundry  
19 issues that surround that as well as the design  
20 certification.

21 We've now made a change in this activity  
22 and we've reconstituted this working group with a new  
23 focus, and that new focus is more on the combined  
24 operating license activities and the operational  
25 activities. We have Dave Rehn, who is the Vice

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1 President of Duke Power Company -- he and also happens  
2 to be Vice Chairman of the Utility Management Board --  
3 as an inter-tie with ARC in support of these  
4 activities. And the membership includes the  
5 utilities, the vendors, as well as the major players  
6 in this and the Department of Energy on this working  
7 group to again take those lessons learned from each of  
8 the designs from the design certification of all four  
9 designs and carry those forward on behalf of the  
10 industry.

11 The first near-term focus of that working  
12 group will be on coordinating the support and  
13 participation of the industry in the upcoming workshop  
14 on design certification form and content, and we're  
15 looking forward to that. We believe that's an  
16 extremely important activity on behalf of the industry  
17 and the Commission as we are close to finishing that  
18 first full complete design certification to ensure  
19 that all process issues are dealt with expeditiously  
20 so we don't slow down the progress in that area.

21 With that, Mr. Chairman and Commissioners,  
22 that concludes my remarks. I accomplished my goal.

23 CHAIRMAN SELIN: Well, actually, you know  
24 there is a very interesting topic. The staff has  
25 become very, very interested in understanding what's

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1 the secret of the Japanese construction processes and  
2 whether our regulatory environment will support such  
3 tight processes, encourage them or stand in the way of  
4 them. I don't know if I should ask whether you have  
5 views on this at this point or whether you've thought  
6 about working with us in trying to review our  
7 environment to make sure that we don't inadvertently  
8 preclude, not so much Japanese processes, but just  
9 good preplanned construction processes as opposed to  
10 a standardized design.

11 MR. COLVIN: Yes, sir, absolutely. I  
12 think through this, the ARC activities and a few of  
13 the points that Mr. McDonald made on those slides,  
14 we're trying to take into account the broader aspects  
15 of that as an industry to capture those lessons  
16 learned.

17 I think in the Japanese ABWR designs they  
18 have a competition between two major vendors or two  
19 major architect-engineers and we are involved as an  
20 industry, mainly through the EPRI process, to look at  
21 those lessons from that from the construction aspects.  
22 That is an integral part, also, of building block 7 on  
23 the life cycle standardization that INPO is supporting  
24 under the ARC activities.

25 COMMISSIONER ROGERS: Just on this subject

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1 of the COL, you noted that one of your activities is  
2 resolution of the COL implementation matters. Have  
3 you commented on the April draft paper, review process  
4 and COL form and content?

5 MR. COLVIN: Yes, sir. We supplied  
6 comments on May 25th to the Commission on SECY-287A,  
7 our comments in writing, and then have been supporting  
8 those through interactions with the staff.

9 COMMISSIONER ROGERS: No, I think it's not  
10 287A. I'm talking about the paper entitled, "10 CFR,  
11 Part 52, Combined License Review Process and COL Form  
12 and Content," and my understanding is --

13 MR. COLVIN: I believe the answer is yes,  
14 but let me defer -- the answer is no. I have a head  
15 shake from up above that the answer is no.

16 COMMISSIONER ROGERS: Last I'd heard, you  
17 hadn't. That's why I was asking you whether you had.

18 MR. COLVIN: I stand corrected, Mr.  
19 Commissioner.

20 COMMISSIONER ROGERS: Well, you didn't  
21 know that you hadn't made it, so you can't tell me  
22 when you will.

23 MR. COLVIN: I probably won't be able to  
24 answer your follow-on questions.

25 COMMISSIONER ROGERS: Well, I would hope

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1 that that would be forthcoming pretty soon, because I  
2 think that is -- if these implementation matters are  
3 going to be resolved, we've got to get your comments  
4 on that paper.

5 MR. COLVIN: Yes, sir. I'll look into  
6 that.

7 CHAIRMAN SELIN: Mr. Long, do you have any  
8 wrap-up comments?

9 MR. LONG: I have no -- I guess we have  
10 had a number of questions. I guess my only question  
11 now is -- you've posed a number of questions along the  
12 way having to do, it seems to me, with kind of a  
13 better definition of the various elements and I'm not  
14 sure we answered those in a very concise form.

15 CHAIRMAN SELIN: You said that you would  
16 send us material. There were three questions that  
17 came up that required or requested further  
18 information.

19 One is perhaps a clearer understanding of  
20 the deliverables that you will have at the end, you  
21 know, what constitutes the completion of the first-of-  
22 a-kind engineering phase.

23 The second is, at least in my case,  
24 perhaps the other Commissioners might want to broaden  
25 this, in the case of the AP-600, what kind of

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1 relationship is there likely to be between the testing  
2 that you -- in other words, ARC or EPRI -- will  
3 require, the confirmatory testing that you will  
4 require, and our own confirmatory testing that we're  
5 planning to do in Japan? In other words, I'm pretty  
6 clear what happens up to the point of the issuance of  
7 the safety evaluation report, but thereafter I'm not  
8 at all clear of the interaction because we'll still be  
9 doing things and you'll still be doing things.

10 And then the third is whatever thought  
11 there might have been on the status of software past  
12 the certification process, because we intend to  
13 certify not based on a design of software but based on  
14 a detailed specification since, first of all, it's  
15 very hard to test the design for safety. You have a  
16 specification you can look at and then you have the  
17 software. And second, we don't want to freeze the  
18 software. We want that to be allowed to be upgraded  
19 with some configuration control during the life of the  
20 certification.

21 And then there was sort of general  
22 discussion about what do you think about construction  
23 interaction, but not a request for any particular --  
24 at least, it might be a topic. I'm sure you'll follow  
25 that up with the staff anyway.

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1                   And then Commissioner Rogers' request of  
2                   the follow-up on the form and content, which maybe  
3                   you're planning on just doing at the conference, I  
4                   don't know how you plan to follow-up on that.

5                   MR. COLVIN:   We'll respond back on that  
6                   question, Mr. Chairman.

7                   COMMISSIONER ROGERS:    I think the  
8                   information management system relationship to NRC, the  
9                   access to your -- to the results of that, I think,  
10                  would be something that would be very interesting to  
11                  us.

12                  MR. McDONALD:   Yes.   We'll discuss with  
13                  your people that concept of the neutral filing.

14                  CHAIRMAN SELIN:   Do you care to make any  
15                  wrap-up comments?

16                  COMMISSIONER REMICK:   I just might say  
17                  that I had hoped for some more specific examples, kind  
18                  of like what Zack gave of what the end result will  
19                  actually mean.   Being an old mechanical engineer, I  
20                  always feel better when I have my hands on something  
21                  and so forth and I would have found that to be  
22                  somewhat more helpful to me.

23                  I agree fully with what John Taylor said,  
24                  that I think a tremendous amount has been accomplished  
25                  over the last couple years.   When you look back when

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1 we were starting with a new Part 52 with a lot of  
2 hope, didn't know if it would really work, I think it  
3 has definitely held up. When you think about the  
4 discussions we've had across this table on things like  
5 depth of design detail, tier 1, tier 2 matters, I  
6 don't think any of us knew exactly what an ITAAC was.  
7 From that we went into DAC and those things resolved  
8 and I think it's a real credit to our NRC staff and  
9 including the staff management of sitting down and  
10 working with the people from the various organizations  
11 from industry in getting us through those hurdles and  
12 seeing that Part 52 has held up to that, and there's  
13 no question about it.

14                   You referred to the fact that Taipower is  
15 using a large portion of the utility requirements  
16 document. That the European Community has found that  
17 that's a way to go and they tell me that fundamentally  
18 their document will not be greatly different than the  
19 EPRI requirement document I think indicates that the  
20 U.S. has taken a lead in this area and people are  
21 watching very closely. I'm very proud to have been a  
22 part of it and I hope that the Commission sitting on  
23 this side of the table has added some contribution to  
24 the process and not too much impedance from time to  
25 time. I think we do deserve some credit also, but

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1 it's a credit to everybody involved and I'm very  
2 pleased with the process and hope to see it completed  
3 to fruition.

4 I thank you very much for your  
5 presentation.

6 CHAIRMAN SELIN: Commissioner de Planque?

7 COMMISSIONER de PLANQUE: I would  
8 certainly associate myself with those comments as well  
9 and I have no further questions. I would just thank  
10 you for the briefing.

11 CHAIRMAN SELIN: I agree with everything  
12 Commissioner Remick said. I'm an information theory  
13 fellow. I've never had my hands on anything and I  
14 still feel unsatisfied that there wasn't enough --  
15 even coming from a very different background from  
16 Commissioner Remick, I share his observation that  
17 there just wasn't enough concrete feeling.

18 If you remember, Mr. Colvin, when I first  
19 went down to NUMARC to be briefed on your views on  
20 Part 52, the briefing was all legalistic. I said,  
21 "Look, let's forget the rule. Let's talk about what  
22 information is needed at what point to make us feel  
23 comfortable that it's safe and then we'll see how the  
24 rule fits that."

25 I would hope we could follow something

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1 more of that approach here, not so much about the  
2 procedures and the management, a little more about  
3 what kind of information and what kind of design you  
4 would expect at different points in the way the next  
5 time that we meet, and perhaps we don't have to wait  
6 six months or a year for the next presentation. We're  
7 very interested in your progress, subject to the  
8 caveats that I gave you earlier during the  
9 presentation, and we'd like to follow-up on that.

10 Thank you very much for your presentation.

11 MR. McDONALD: Thank you.

12 MR. LONG: Thank you.

13 MR. COLVIN: Thank you, sir.

14 (Whereupon, at 12:04 p.m., the above-  
15 entitled matter was adjourned.)  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

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PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: SEPTEMBER 10, 1993

were transcribed by me. I further certify that said transcription  
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# **Advanced Reactor Corporation**

## **Organization and Activities**

**Presented to  
Nuclear Regulatory Commission**

**10 September 1993**

**Louis Long, Chairman, ARC Utility Management Board  
Pat McDonald, Executive Director, ARC  
John Taylor, Vice President, EPRI  
Zack Pate, President, INPO  
Joe Colvin, President, NUMARC**

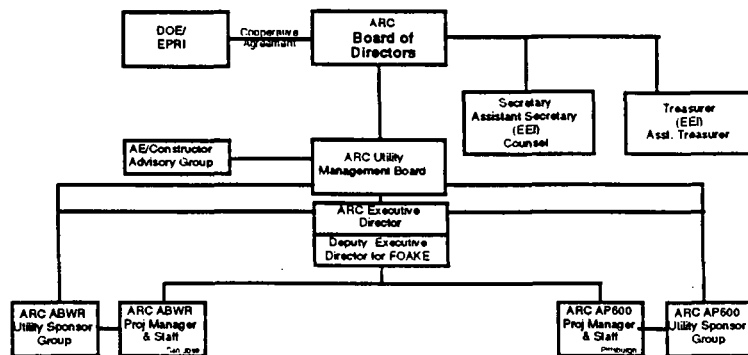
# ADVANCED REACTOR CORPORATION (ARC) ORGANIZATION

BY

LOUIS LONG  
CHAIRMAN, ARC UTILITY  
MANAGEMENT BOARD

SEPTEMBER 10, 1993

## ARC ORGANIZATION





## **ARC MEMBERSHIP (Class 1)**

- American Electric Power
- Commonwealth Edison Company
- Consolidated Edison Company
- Carolina Power & Light
- Duke Power Company
- Florida Power & Light
- GPU Nuclear
- Philadelphia Electric Company
- Pennsylvania Power & Light
- Public Service Electric & Gas
- Southern Nuclear
- Texas Utilities Electric
- Tennessee Valley Authority
- Union Electric
- Wisconsin Electric Power Company

3

## **ARC MILESTONES**

- **DOE/EPRI Cooperative Agreement**
  - Evolutionary and passive designs
  - \$200 million program
- **FOAKE Design Selection**
  - ABWR and AP600 selected
  - Westinghouse and GE Contracts finalized
  - \$276 million program

4

# **ARC MANAGEMENT AND COORDINATION**

**BY**

**PAT McDONALD  
EXECUTIVE DIRECTOR  
ADVANCED REACTOR CORPORATION**

**SEPTEMBER 10, 1993**

5

## **STRATEGIC PLAN FOR BUILDING NEW NUCLEAR POWER PLANTS OF NUCLEAR POWER OVERSIGHT COMMITTEE**

- "NPOC has asked ARC to undertake in the coming year the coordination of the safety regulation, utility requirements and project-specific Building Blocks 2, 3, 4, 5, 6 and 7.." reporting its assessments to the NPOC Ad Hoc Committee.

6

### Generic Safety/Environmental Regulation and Industry Standards

(3) ALWR Utility Requirements (EPRI-USC)

(4) NRC Design  
Certification  
(Plant Designers)

(5) Siting  
(EPRI/NUMARC)

(7) Life-Cycle  
Standardization (INPO)

7

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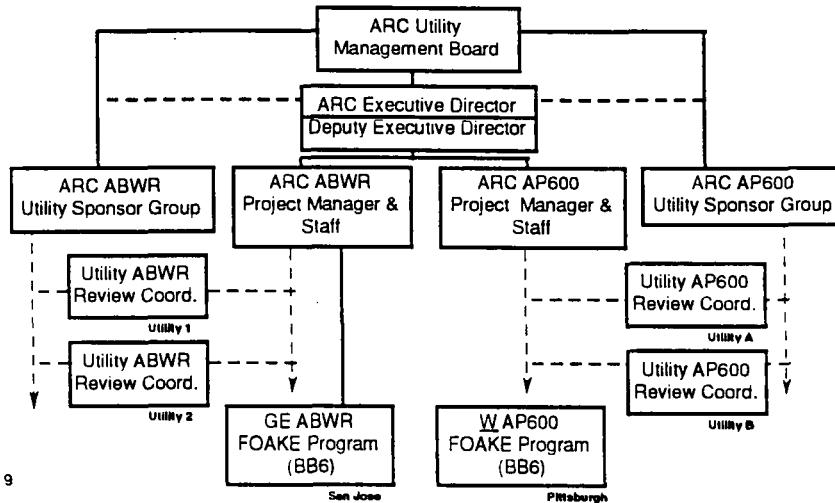
graph TD
    DOE[DOE/EPRI Cooperative Agreement] --- ARCBD[ARC Board of Directors]
    ARCBD --- Sec[Secretary Assistant Secretary (ED) Counsel]
    ARCBD --- Treas[Treasurer (ED) Asst. Treasurer]
    ARCBD --- AEC[AE/Constructor Advisory Group]
    ARCBD --- UMB[ARC Utility Management Board]
    UMB --- AED[ARC Executive Director  
Deputy Executive Director for FOAKE]
    AED --- JSG1[ARC ABWR Utility Sponsor Group]
    AED --- JSG2[ARC AP600 Utility Sponsor Group]
    AED --- Reg[Regulatory Stabilization (BS2) Siting (BS6) NUMARC]
    AED --- ALWR[ALWR Program Office URD (BS3) Siting (BS6) SBWR Design Cert. System 90+ Design Cert (URD) EPRI]
    AED --- LSC[Lite-cycle Standardization (BS7) INPO]
    AED --- EPUSC[EPRI USC Members: US & Int'l Utility Execs]
    EPUSC --- GEABWR[GEABWR FOAKE Program (BS6)]
    EPUSC --- GEABWR2[GEABWR Family Skds Planning]
    EPUSC --- WAP600[WAP600 Family Skds Planning]
    EPUSC --- WAP6002[WAP600 Design Certification (BS4)]
    EPUSC --- WAP6003[WAP600 FOAKE Program (BS6)]
  
```

The organizational chart for the ARC Board of Directors is structured as follows:

- DOE/EPRI Cooperative Agreement** is linked to the **ARC Board of Directors**.
- The **ARC Board of Directors** oversees:
  - Secretary Assistant Secretary (ED) Counsel**
  - Treasurer (ED) Asst. Treasurer**
  - AE/Constructor Advisory Group**
  - ARC Utility Management Board**
- The **ARC Utility Management Board** oversees the **ARC Executive Director / Deputy Executive Director for FOAKE**.
- The **ARC Executive Director** oversees several entities:
  - ARC ABWR Utility Sponsor Group**
  - ARC AP600 Utility Sponsor Group**
  - Regulatory Stabilization (BS2) Siting (BS6) NUMARC**
  - ALWR Program Office URD (BS3) Siting (BS6) SBWR Design Cert. System 90+ Design Cert (URD) EPRI**
  - Lite-cycle Standardization (BS7) INPO**
  - EPRI USC Members: US & Int'l Utility Execs**
- The **EPRI USC Members** oversee:
  - GEABWR FOAKE Program (BS6)**
  - GEABWR Family Skds Planning**
  - WAP600 Family Skds Planning**
  - WAP600 Design Certification (BS4)**
  - WAP600 FOAKE Program (BS6)**

8

## ARC FOAKE MANAGEMENT



9

## ARC MANAGEMENT OF THE FOAKE CONTRACTS

- The scope of FOAKE work
  - Detailed engineering that is not site-specific
  - Complete for certain major components
  - Complete only to “form, fit, and function” for remainder of components (to proceed further would require component procurement commitments)
  - Other deliverables

10

## **ARC MANAGEMENT OF THE FOAKE CONTRACTS**

- The basic process
  - Contract deliverables
  - Schedule for deliverables
  - Reviewers
  - Review bases
  - Approvals
  - USG oversight
  - UMB top level management oversight
  - Shared responsibilities with DOE

11

## **ARC MANAGEMENT OF THE FOAKE CONTRACTS**

- Other processes and activities
  - Conformance assessments of FOAKE work
  - Design reviews
  - Schedule reviews
  - Other day-to-day interactions between on-site ARC staff and design team

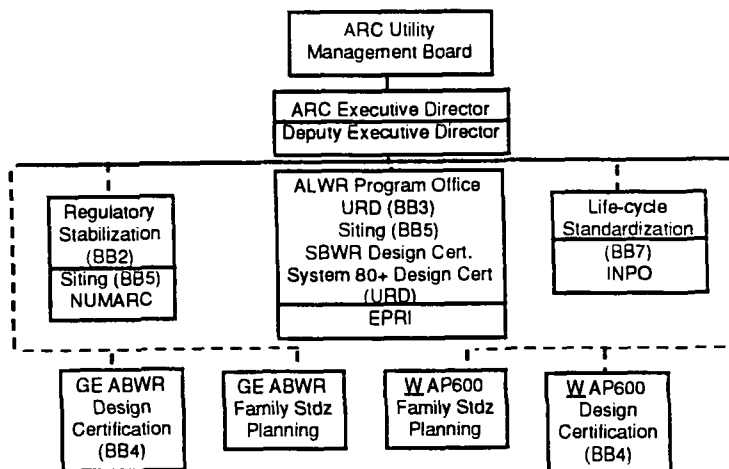
12

## ARC MANAGEMENT OF THE FOAKE CONTRACTS

- Other processes and activities (continued)
  - Reviews of testing progress and results
  - Reviews of standardization plans and progress
  - Reviews of the Information Management System plan and status
  - USG reviews of potential changes to the URD
  - USG concurrence required for changes to URD
  - USG cost effectiveness reviews

13

## ARC COORDINATION ONLY



14

## **ARC COORDINATION ONLY**

- **Matters of coordination**
  - The “big picture” about the objectives, status, and problems
  - Interfaces and interactions among building blocks
  - Interdependent schedules
  - Shared responsibilities with DOE
  - Support among building blocks
  - Integration of foreign and domestic utility participation

15

## **ARC COORDINATION ONLY**

- **Means of Coordination**
  - Extensive exchange of information among working groups
  - Several working group members participating in more than one group
  - Electronic networks among groups and utilities are being expanded
  - The present Executive Director of ARC is “double hatted” as Chairman, Utility Steering Committee of the EPRI ALWR Program

16

## **TOPICS OF DISCUSSION AMONG PARTICIPANTS IN ARC ACTIVITIES**

- The need to derive maximum safety and economic benefits from standardization among member plants of each design family
- Plants in a standardized family should be more efficient to regulate and to be regulated
- Plants in a family should be able to make economical use of a cooperative or pooled common-support group to handle standardized functions that need not be done on site

17

## **TOPICS OF DISCUSSION AMONG PARTICIPANTS IN ARC ACTIVITIES**

- What constitutes "predictable licensing and regulatory stability" for future plants? Can the efficiency of regulation be improved with the more robust plants of the future?
- More effective management of the scheduling interface between each ALWR design certification applicant and the NRC is needed

18



## **TOPICS OF DISCUSSION AMONG PARTICIPANTS IN ARC ACTIVITIES**

- How do we assure that the updated and sophisticated techniques used in the construction of some Asian nuclear plants will be available in the U.S.?
- What is the best approach for developing or identifying the essence or models for the best processes, procedures, organizations, or other functional standards which we need to adopt for new standardized plants?
- The need for an adequate information Management System available for use through the entire scope of plant design, construction, startup, and operation is recognized

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## **EPRI ALWR PROGRAM**

**BY**

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VICE PRESIDENT  
ELECTRIC POWER RESEARCH  
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**SEPTEMBER 10, 1993**

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## **ALWR--THE UTILITIES' INITIAL VISION**

- Create a foundation for better nuclear plants: safe, reliable and economical--simpler, more rugged, based on proven technology, designed with the operator in mind
- Develop utility (owner-operator) requirements applicable to the design of ALWRs
- Solicit NRC's findings through a Safety Evaluation Report regarding licensability of a plant designed in accordance with utility requirements

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## **EIGHT YEARS OF PROGRESS**

- Evolutionary and passive ALWRs
- U.S. DOE support
  - MOU on design certification
  - Cooperative agreement on FOAKE
- International utility involvement
  - Technical and financial participation
  - 10 countries
- Resolution of regulatory issues

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## **EIGHT YEARS OF PROGRESS**

**(continued)**

- Engineering through design certification and first-of-a-kind engineering
  - ARC established to manage/coordinate
  - EPRI technical and administrative support
  - NUMARC and INPO standardization support
  - Partnership with DOE
- NPOC Strategic Plan--comprehensive, utility-driven plan to build new nuclear plants

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## **SPECIFIC ACHIEVEMENTS BY INDUSTRY & NRC**

- Utility Requirements Documentation in place
  - FSERs prepared by NRC staff
  - Being used as a basis for DC and FOAKE
- Beginnings of international cooperation and consensus
  - Taipower bid spec
  - European requirements
- Closure on key issues
- Significant progress toward Design Certification

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## **WHAT'S AHEAD**

- Conformance assessment of designers' implementation of the URD
- Continuing to close out issues (SECY 93-087)
- Keeping the URD up to date
- Obtaining Final Design Approval / Certification from NRC
- Completing First of a Kind Engineering
- Some challenges:
  - Testing--essential for NRC and owner-investor confidence in passive systems reliability
  - Plant economics--first cost and life-cycle cost
  - Operational factors--tech specs

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## **LONG RANGE STRATEGY FOR LIFE CYCLE STANDARDIZATION**

**BY**

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**SEPTEMBER 10, 1993**

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# **NUMARC SUPPORT OF ARC ACTIVITIES**

**BY**

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**PRESIDENT  
NUCLEAR MANAGEMENT AND  
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**SEPTEMBER 10, 1993**

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## **PREDICTABLE LICENSING AND STABLE REGULATION**

- NUMARC is addressing generic regulatory matters associated with achieving the goals of the NPOC Strategic Plan, including:
  - Part 52 implementation
  - Regulatory aspects of life-cycle standardization issues
  - ARC project interactions with NRC
  - ALWR emergency planning requirements
  - Early siting

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## **RECONSTITUTED NUMARC WORKING GROUP**

- ALWR Regulation Working Group
- Succeeds the NUMARC Standardization Oversight Working Group (SOWG)
- Increasing focus on COL and operational matters
- Chaired by Dave Rehn, Vice President of Duke Power Company and Vice-Chairman of ARC UMB
- Membership includes utilities, vendors, INPO, EPRI, ARC and DOE

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## **NEAR TERM FOCUS OF WORKING GROUP SUPPORT**

- Design certification form and content (SECY-92-287-287A)
  - Assist in coordinating industry participation in NRC workshop
  - Provide industry comments on forthcoming *Federal Register* Notice
- Resolution of COL implementation matters

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