UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON

STATUS OF NEW REACTOR LICENSING ACTIVITIES

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NUCLEAR REGULATORY COMMISSION

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Rockville, Maryland

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WEDNESDAY

May 29, 2002

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The Commission met in open session, pursuant to notice, at 9:30 a.m., the Honorable GRETA JOY DICUS, Commissioner, presiding.

COMMISSIONERS PRESENT:
NILS J. DIAZ, Member
GRETA J. DICUS, Member
JEFFREY S. MERRIFIELD, Member
EDWARD McGAFFIGAN JR., Member

(This transcript produced from electronic caption media and audio and video media provided by the Nuclear Regulatory Commission.)

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

STEPHEN BURNS, NRC, Deputy General Counsel
SAMUEL COLLINS, NRR
FAROUK ELTAWILA, RES
MARVIN FERTEL, NEI
EUGENE GRECHECK, Dominion
THOMAS KRESS, ACRS
JAMES LYONS, NRR
CARL PAPERIELLO, DEDO
JAMES RICCIO, Greenpeace
ASHOK THADANI, RES

I-N-D-E-X

AGENDA

Dr. Thomas Kress

Mr. Fertel

Mr. Riccio

Mr. Grecheck

Questions

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

9:31 a.m.

COMMISSIONER DICUS: Well, good morning, ladies and gentlemen. On behalf of the Commission, I'd certainly like to welcome all of you to this morning's briefing, which is on the status of new reactor licensing activities. Clearly, I'm not Chairman Meserve. The Chair did participate in some rather serious manual labor over the weekend in his yard, and he is flat on his back with a bad back, so he can't be with us today. So I'm Acting Chairman, at least for the first part of this briefing, and then I'm going to have to leave and Chairman -- Commissioner Diaz will take over as Acting Chairman at that point.

I apologize for that, but I had long before this had been established, I had committed to give some remarks at a retirement luncheon for Lake Barrett who is DOE's Yucca Mountain project. So I need to leave and represent the Commission there, so Commissioner Diaz will take over at that point.

In the event that the staff's presentation does not get finished before I have to leave, I do have some questions, and so we will submit them as a matter of record for this briefing if they're not answered during the period of time that you present your slides.

I should also like to recognize Ms. Linda Keen who is the President and CEO of the Canadian Nuclear Safety Commission. She and the Canadian Delegation are sitting in with us for a while this morning to observe a Commission meeting, so let's all be on our really good behavior.

(Laughter.)

We will hear presentations from the NRC staff and then several of our stakeholders regarding their views on the initiatives being pursued by the nuclear industry in preparation for a possible resumption of nuclear power plant orders after a hiatus of more than 25 years and the complementary initiatives being undertaken by the NRC to ensure that we are prepared to meet our regulatory responsibilities when we receive applications for certification of new designs, early site permits or combined construction permits and operating licenses for new reactors.

This is an area in which the amount of activity has been rapidly increasing. A few years ago the suggestion that new nuclear power plants might be built in the near future would likely have been scoffed at. However, the influence of a number of political, economic and technical factors has served to make the nuclear option attractive again. The industry, with support from the Department of Energy, is vigorously pursuing technical, financial and regulatory issues associated with new reactor designs and the NRC has followed suit.

We have established groups within our major program offices to address issues related to new reactors. We are currently reviewing Westinghouse's application for design certification for the AP1000, and we are in "pre-application," in quotes, discussions with several other reactor vendors. We also expect to receive three applications for early site permits during calendar year 2003. And we are examining our regulatory infrastructure in this area to ensure that we are prepared to conduct our reviews in an efficient and timely fashion.

We will begin this morning with a presentation from the NRC staff, discussing current Agency activities and future plans related to new reactor licensing. So now I'd like to turn to my colleagues and see if any of you would like to make an opening statement.

Okay. With that, then please proceed, Dr. Paperiello.

DR. PAPERIELLO: Good morning. Madam Chair, commissioners, the staff is here today to brief the Commission on new reactor licensing activities and issues. With me today are Mr. Sam Collins, Director of NRR; Mr. Ashok Thadani, Director of the Office of Research; Mr. Farouk Eltawila, the Director of the Division of Systems Analysis and Regulatory Effectiveness; and Mr. James Lyons, Director of the New Reactor Licensing Project Office.

The staff today is going to be informing the Commission of activities since the last briefing on this topic, which was held on July 19 of last year. And they will be discussing both current activities as well as upcoming challenges. With that, I'd like to turn it over to Mr. Sam Collins.

MR. COLLINS: Thank you, Carl. Good morning. I have a clarification. Does this mean that there's more time for questions or less

time for questions.

COMMISSIONER DICUS: More time.

MR. COLLINS: More time, okay. I want to be sure it's clear. Thank you. Before we start the formal presentation, I'd like to make a few brief remarks and then move quickly onto the formal presentation by the staff.

As mentioned by Commissioner Dicus, Acting Chairman, this is an exciting area for the Agency at this point in time. We continue with our preparations for the product lines that will be discussed today, and there are many policy questions before the Commission and yet to be identified and addressed by the Commission and the staff. These include not only technical challenges but clearly infrastructure issues too, and we'll be talking about some of those today during the course of our discussions.

We have been looking forward to this challenge by forming an organization in the Office of Nuclear Reactor Regulation with our counterparts in research to address these challenges, and we have Jim Lyons here today as the head of the Organization to lead the technical discussion, along with Farouk.

The ESP, early site permits, are the first product line to develop recently, although we have certified designs that have taken place in the past as well as the Part 52 infrastructure that has been developed in the past. So we have a pretty good track record in this area as far as being able to achieve goals.

However, in light of the new way of doing business, which includes the strategic plan and the business modeling, as indicated by the way that we have approached license renewal and power uprates, we will attempt to address the challenges having to do with new licensing and early site permits in that businesslike manner. And I think today you will hear some of those challenges in terms of a stable, predictable, timely, transparent regulatory process with stakeholder involvement to ensure that we have proper planning and coordination to achieve those goals.

And those include stakeholder obligations as far identifying product lines, doing that in a timely way and providing for our schedulers to provide for integrated work coordination. As you know, we had three early site permits, and we'll talk about the challenges of those coming in concurrently in Jim's presentation.

Our strategic plan goal is to maintain an effective regulatory infrastructure to assure the maintenance of safety during construction of envision advanced reactors. And we will encourage applicants, vendors and others to inform the NRC at their earliest opportunity of planned future reactor activities so that we will be prepared to respond.

As far as planning is concerned, it's based on the schedule and resource estimates given in a Commission paper at SECY-01-0188 . There are a number of other products that Jim will go through quickly during the early portions of his presentation, which will outline the beginnings of our infrastructure and some of those policy decisions for the Chairman today -- for the Commission today, excuse me.

Our activities are prioritized in conjunction with other Agency work. As you know, the Commission has challenged us in license renewal and also in power uprates to maintain those highly visible and programmatic areas on schedule, and we have been able to do so.

This is a dynamic situation, as you know, by the emergence not only of the technology lines but also by the investment in the technology lines, as indicated by the recent decisions in the PBMR and some of the emerging technologies, which Jim will mentioned, which our challenge is to the staff, because they have been identified but they have not been committed to. And particularly in remarks by our key members in research, there is long lead planning that is necessary for some of these emerging technologies. We need good information from the industry, including the timing of applications, which can have a large impact on NRC resources, and we need realistic schedules for proper planning and for proper identification of measurable goals.

We had a meeting yesterday with the early site permit, and many of the stakeholders are in the room today who took part in that meeting, which took place here in headquarters, and Jim will be talking about that today. So unless there's any further questions, I'll turn the first part of the presentation over to Jim Lyons.

MR. LYONS: Thank you, Sam. Good morning. If I could have the second slide of my presentation overview. Good morning. I'm going to provide you with the status of the new reactor licensing activities. I'll discuss the work we've accomplished since we briefed you last July, our current activities, how we are interacting with our stakeholders, and I'll end with a discussion of some of the challenges we face when it comes to scheduling our efforts. Then Farouk Eltawila will discuss some of the technical and policy issues the staff is working on and when we expect to engage the Commission on those issues. If I could go to Slide 3, please.

The next four slides list the papers that we provided the Commission in the last year, and I'll walk through these fairly quickly. The future licensing and readiness inspection readiness assessment provided our assessment of the staff's readiness to conduct future licensing activities and inspection activities. It concluded that we were ready to complete the activities we're engaged in, less notably the pre-application review, reviews of the PBMR and the AP1000 standard design. But we also indicated that additional work would be needed to be ready to conduct combined license and early site permit activities.

SECY-01-0207 provided the staff's initial positions on a series of legal and financial issues that were related to Exelon's Pebble

Bed Modular Reactor and also has some generic applicability. Since then, the staff has held a public workshop on the issues and has met with the Nuclear Energy Institute to get feedback on the issues, which has generic applicability to modular and merchant plants that are envisioned in the future. We will be providing the Commission with our final proposal on these issues in August. Slide 4.

This paper informed you that we had completed our pre-application review of the AP1000, and we provided the staff's basis for accepting the use of design acceptance criteria for the AP1000 standard design in the areas of instrumentation and control, human factors, control room issues and the piping design. Slide 5.

Last month, we provided the Commission with our position on the use Programmatic ITAAC and included in that paper was a legal analysis by the Office of General Counsel. And we are awaiting the Commission's decision on this issue. Slide 6.

Earlier this month we provided you with two papers. First was our semi-annual update of the readiness assessment that gives the status of our new reactor licensing activities and is the basis for this presentation, and we also provided a proposed change to 10 CFR Part 52 for early site permits, design certifications and combined licenses.

Slide 7 lists the current activities that I will be discussing in more detail on the next series of slides.

Slide 8 takes us to the PBMR pre-application. As you know, Exelon announced on April 16 they will not proceed with the PBMR project beyond the current phase that they're in. We met with Exelon last week to develop a plan to bring this project to a logical conclusion. We agreed with Exelon that the staff and Exelon will document the status of the review, where we are now, so that a future applicant or a future vendor could come in and pick up that review fairly easily and at least know what we had completed and what issues needed to be addressed. As I discussed before, we provided our recommendations on modular and merchant plan issues and we will be providing our final status of those in August of this year.

We move on to Slide 9. As we discussed before, Westinghouse applied for a design certification for the AP1000 on March 28. We're in the process of completing our acceptance review of their application, and we will be issuing that shortly. And we are also preparing a detailed schedule and resource estimate that we will provide to Westinghouse in late June or early July. And as I discussed, as part of our pre-application, we did find the use of design acceptance criteria acceptable for the AP1000 design. We also, in part of our pre-application review, looked at issues related to some exemptions that they had requested for AP600 that would still be applicable to AP1000, and looked at the applicability of the testing and analysis that they had done for AP1000 that it would still be applicable for AP1000.

Slide 10, we have started a pre-application review of the General Atomics GT-MHR. I'm sorry, there's a mistake on this slide. We actually responded to General Atomics on May 13, not May 14. The pre-application review that we're working with General Atomics on will be similar to the one that we had planned for PBMR. It will familiarize the staff with the GT-MHR design and technology and allow us to assess our analytical tools and to establish an independent staff capability to quantitatively assess the high temperature gas reactor safety performance. And in addition, we'll be identifying key technology issues and safety implications and including the research that would be needed to address these issues.

Slide 11, a lot of work has been going on on early site permits. As you know, in June, we expect Exelon and Entergy to apply for early site permits for the Clinton and Grand Gulf sites, and then in September, Dominion -- these are in September of '03 -- Dominion will come in with their application for the North Anna site. For the early site permit, the staff reviews the environmental impact, or how the nuclear plant will affect that site; the site suitability, or how the site will affect a plant that would be placed on that site; and the site emergency plan, or whether there are any impediments to developing a site emergency plan.

Yesterday, as Sam had indicated, we held a kickoff meeting with all three prospective applicants to discuss pre-application activities. The pre-application activities, while not required, are meant to make the review more efficient and effective when we actually receive these applications. We will work to resolve the issues that NEI has identified in a generic way. Some of those issues are the quality assurance requirements for the early site permit information, the data that they're gathering now. We're looking at early site permit inspection guidance and guidance on seismic evaluations that are required by Appendix S to 10 CFR Part 50, which looks at a seismic hazard analysis that wasn't done back when we were doing construction reviews previously.

In addition, we discussed the nature and timing of the NRC's activities that would be held prior to the early site permit application, and one of these is public meetings that we want to hold in the vicinity of each proposed site to describe our process for issuing an early site permit and to inform the public how they can be involved in the process.

To move on to infrastructure development, the next slide, we're developing the infrastructure that would be necessary to perform these new reactor licensing reviews in an efficient and effective manner. As I discussed before, we have provided a proposed update to 10 CFR Part 52. In addition, we are addressing two NEI petitions for changes to Part 52 regarding the use of existing data for early site permit applications and the elimination of reviews of alternate sites, alternative energy sources and the need for power. We will provide recommendations to the Commission on these petitions in September. We are also developing plans to revise Tables S3 and S4 in Part 51, which deal with the environmental effects of the uranium fuel cycle and the transportation of nuclear fuel and waste. And we're also looking at other rules that are discussed in our readiness assessment that I won't go into.

We have formed a team of headquarters and regional representatives with construction and inspection experience to update the construction inspection program. The initial focus of this team is on the guidance for early site permit applications, because we are expecting to start work on those even this year.

In addition to the Programmatic ITAAC issue that I discussed before, we are working with our stakeholders on how the ITAAC process will be implemented once a combined license is issued. Some of things we're looking at is how the staff will document its review of ITAAC completion and the criteria for reopening an ITAAC after the staff has found it to be essentially completed.

The staff is developing an advance reactor research plan that will be provided to the Commission in September. Elements of the plan are to develop analytical tools and data to allow the staff to independently confirm an applicant's safety basis. It will also provide the technical basis for any regulatory changes that we are developing and, as Sam indicated, we want to identify any long lead time issues that need to be started now in the near term to prepare us for the future non-light water reactor designs.

In a related activity, the staff is developing a common set of risk-informed initiatives that would be applicable to both operating and new reactors. NEI submitted a proposed white paper proposing improvements that would be applicable to all reactors. This will be discussed in more detail in the June 2002 update of the risk-informed regulation implementation plan.

Stakeholder interactions. We've been trying to work with all of our stakeholders. We've held two public workshops, one describing the future licensing process, the other on legal and financial issues. We participated in the ACRS' public workshop last June on advance reactors. We provide the public opportunity to comment at all our meetings so that we can find some of the issues that are being raised early. And as I discussed before, we plan on conducting meetings in the vicinity of sites designated for early site permits to let the local populous understand our process.

We're continuing to work with industry, certainly in the workshops that I discussed above, plus in meetings on early site permits, the ITAAC implementation process, pre-application reviews and design certification review. We're continuing to keep the ACRS informed of our activities. We've had four briefings with them of the full Committee during the last year, and we'll continue to keep them informed of the activities and staff positions as we move forward. In fact, Tom Kress handed me a proposal for how we're going to interact with them in the next year or so, so it helps to have some contacts over there.

We've also worked within the NRC. We provided an internal workshop last July, again, to inform our staff of the Part 52 process, a lot of them were never involved in this previously, and to give them a flavor of the type of plants that are coming in. We've also gone out to the regions to discuss our program with our regional counterparts. We're keeping informed of DOE's near-term deployment activities. We're working with them on interagency funding agreements and are trying to coordinate our research activities with them, especially in the area of nuclear fuel. We'll also be working with FEMA when we get to working on the emergency preparedness reviews for early site permits.

We've had several overseas visits that focused on high temperature gas reactor issues. The staff went to Germany, Japan, China, South Africa and the United Kingdom to try and understand the work that's being done there. And we're exploring areas where we can leverage the research activities of our international counterparts. Go to my last slide.

As Sam discussed before, we need good information from the industry so that we can effectively plan and schedule our workload. As the last several months have shown, this is a very dynamic situation. The Exelon decision on PBMR has had a large impact on the resources we had planned for the combined license review in fiscal year 2004. Having three simultaneous early site permit reviews going on at the same time will present a challenge with us. In our original readiness assessment, we had indicated a 30-month scheduled that used the license renewal review as a model. However, that model that assumed that there were no resource constraints or conflicts with other high priority reviews and that the first application would come in substantially before the second so that we would have some time to get accustomed to the review. We also assumed that there would be limited hearing activity. Now that we know that the three applications are coming in within three months of each other, we've taken a step back, we're developing an integrated schedule to determine how we can meet our projected 30-month schedule, factoring in especially the environmental reviews that are going on in license renewal and in power uprates and coming up with a good plan. And as we discussed with our stakeholders yesterday, we plan on working with them on that plan throughout the summer to come up with a good plan on how we can do this.

Other things that have gone on after Exelon told us on April 16 that they were withdrawing from PBMR, two days later General Electric submitted a request to start a pre-application review on their ESBWR, which is a 1380 megawatt electric boiling water reactor that incorporates passive safety features. We had done some review on their original SBWR earlier in the 1990s, and we hope to build on that review as we start this pre-application review. They're looking for a 12-month pre-application review. We're going to meet with them later on in June, and we expect to reach agreement on the scope and schedule of that pre-application review later this summer. The design certification application could then come in after the completion of that pre-application review.

In March, we met with Framatome on SWR 1000, which is a 1000 megawatt electric boiling water reactor that also incorporates passive safety features. Framatome has indicated to us that they may request the pre-application review of their design to begin early in calendar year of 2003. We are planning on meeting with them again in August.

For the GT-MHR, in their February letter, General Atomics had said that they were seeking a sponsor for their GT-MHR design but in recent meetings we have seen that they are now getting industry support to continue their project.

As the industry's plans change and new projects are presented or current projects are canceled or delayed, the staff will be using the planning, budgeting and performance monitoring process to prioritize the work and allocate resources to integrate the new reactor licensing activities into the overall NRC budget.

With that, I thank you for the opportunity to provide the status of the new reactor licensing activities, and I'll now turn it over to Farouk Eltawila who will discuss technical and policy issues we are working on and when we expect to engage the Commission.

DR. ELTAWILA: Thanks, Jim. Good morning. Slide 15, please, has an outline of my presentation on the key technical and policy issues for advance reactors. I'm going to start with the issue for light water reactor, followed by the gas cooled reactor and then our proposal to develop a risk-informed, performance-based regulatory infrastructure to deal with advance reactor like gas cooled reactor. And then I will conclude with a list of the people that we are going to provide to the Commission to engage your guidance on some of the policy issues.

Slide 16, as Jim indicated, that we have completed the pre-application review of the AP1000. As a result of that review, we have concluded that the AP600 test and analysis are equally applicable to AP1000, except for one phenomena, and this is called the entrainment phenomena, and just puts in perspective if you have an AP600 after a small break LOCA, the water level or the two-phase flow will drop but remain above the core. For the higher power plants, the water level will still remain above the core but at much lower level than the AP600. So when you open for the ADS for the automatic depressurization system, we won't be sure that you don't move more water than you need to uncover the core. So that's what's the issue that we are addressing right now.

DOE, in collaboration with NRC, is conducting a test program at the Oregon State University, the APEX facility, which was used for the AP600 and has been upgraded to the AP1000. After DOE finishes its work, we are planning to conduct our own research program. The area we are interested in, the effect of thermalhydraulic uncertainty under the liability of passive system. Can these changes in thermalhydraulic affect the activation of the different systems?

The way we go through that issue during the AP600, and it was really recognized as very good piece of work by the ACRS, is that we start challenging the system beyond its design capability. So we delayed the activation of the ADS system, we delay injection of water, we degraded the water flow, and we assumed more than a single failure. Out of the four ADS valve, we assumed three of them failed. And in every case, we found there is a substantial margin to safety, and that helped us to ascertain that the design is robust. We are planning to do a similar set of tests for the AP1000 to have the same level of assurance. So that's the part what we call beyond design basis test at the APEX facility and that program will start in October of this year.

Slide 17 is dealing with the GE ESBWR and the Framatome SWR 1000, and these two designs are building on existing light water reactor technology, so our design basis accident and acceptance criteria are well-established and we don't see any major area here that will require extensive resources. In the severe accident requirement, also we understand the phenomena with severe accident. We have seen some of the proposed design feature, and we are confident that we can review this issue. So there are no major technical issues, but I would like to touch on a couple of them in the next viewgraph.

On Slide 18, the ESBRW and the SWR are similar to the AP600 and the AP1000. They rely on passive components to deal with accident. So as such, the same issue about passive system reliability and the issue of uncertainty in thermalhydraulic and the effect on the system reliability are the same issue. And the way we are planning to deal with, we are going to be dealing with them the same way we have dealt with them for AP600 and what we are doing now for the AP1000. So we are going to challenge the system and look at different opportunities to have multiple failures and see what is the margin to safety for this design.

On Slide 19, again, this design is for a new plant design similar to the AP600 and AP1000. It has some feature to cope with severe accident. One of the features is the in-vessel melt retention by which that the cooled reactor lower head of the reactor vessel by external flooding so they can cool it and retain most of the material inside the vessel so that you will not have the other phenomena that happened in the containment. So all four designs -- AP600, AP1000 ESBWR and SWR 1000 -- have this design feature.

At the time we reviewed the AP600, there was not enough data to confirm the hypothesis that external cooling will retain the molten material inside the reactor. So although the design feature is there, NRC did not give them credit for that capability. Since then we have completed two test programs, the Rospolov Program and the Maska Test Program. Both of them are run in Russia as part of international agreement. And we get data from this program. The data says, yes, that you can indeed cool the lower head of the smaller plants like the AP600. For low power density, low power plants, you can retain the molten material in the lower head. However, if you go above that, the data is not very conclusive. As a result of that, DOE is proposing a test program at the University of California-Santa Barbara to extend the information that came from the Rospolov and Maska program to high power reactor like the AP1000. We are going to be following on this activity as we see results coming from DOE.

As a second layer toward defense in that all these designs also have the capability to flood either the drywell or the containment and add water on the top of the debris. That has three benefits. One of them, a scrub-deficient product so a deficient product release, even if the containment fail will be much lower than if you don't scrub it. Second beneficial effect, it will slow down the core complete interaction so you don't get a release of large amount of non-condensable gas that can fill the containment early. And it eventually will quench debris.

The reason I'm saying eventually because unfortunately our test program at the Mase melt attack and coolability experiment that was sponsored NRC, EPRI, DOE and international community have been inclusive due to the technical difficulty in running the experiment. But we know that eventually it's a heat balance between the amount of heat that's generated versus the amount of heat -- but we have tried to overcome the experimental difficulty to be able to prove that.

So we started a new program called molten core concrete interaction that's sponsored NRC, DOE and the international community under the auspices of NEI. And the program starts this year and is going to be about four years before we can get all the information out of this program.

Our plan for the -- I'm sorry, slide 20. Our plan for the ESBWR and SWR 1000 is similar to what we have been doing for the AP1000. As Jim indicated, we have done work on ESBWR and we've built a PUMA facility at Purdue University at 600 megawatt

electric, 670. And we have collected information from that facility. If GE decided to go beyond the initial state of pre-application review and go to COL, we will need to upgrade the PUMA facility to the higher power level, run some experiments and develop input model to be able to do confirmatory analysis. As part of the pre-application review, we plan to look at the scaling analysis, we look at the experimental data, and we work with NRR about seeing the applicability of all the tests that were run by GE and Framatome to support their application.

I'd like to switch now to the gas cooled reactor in Slide 21. And we have been working over the past year with Exelon and other stakeholders, and we interacted with a lot of national and international groups about the issue of gas cooled reactors. We believe right now that there are -- we have enough information to come to the Commission on advice on key policy issues. These policy issues are vital to viability of this design, because they are very important to the cost control and the safety of this plant. So we are planning to come to you in June with information about the five policy issues. It's the use of probablistic assessment in the selection of the design basis event and the classification of system and component, the issue of fuel performance testing and the qualification and what role the beyond design basis testing will play into the licensing process, the issue of source term. The advance reactor of the gas cooled type are relying on plant-specific source term rather than the prescribed 14844 or NUREG 1465 source term. So they won't use a plant-specific source term so that, again, that's a policy issue that we'd like to get your insight on that.

Continuing on Page 22, the remaining two issues are the containment performance and emergency evacuation and what roles these two barriers play for designs that have very small efficient product release. As you can see, all these issues are interrelated and we believe a solution of one issue is going to affect the decision made on the other issues, so we'd like to deal with them in an integral fashion, and that's what we are proposing in the Commission paper.

We are meeting with the ACRS on June 6 to discuss some of these issues, and then unless we hear from other stakeholders -- we're planning to meet with other stakeholders too and try to finalize our recommendation to the Commission by the fall of 2002 and submit another Commission paper with the recommendations for this.

On Slide 23, I'd like to talk about our initiative to try to develop a risk-informed, performance-based regulatory guideline. Before I start that, it is clear that we can use the existing framework to license any plant with any technology. However, it will require an exemption process, which will identify additional issues, maybe additional rulemaking, and that might not be the best way to utilize our effort, our staff and contractor and so on.

So we are proposing to develop a performance -- risk-informed, performance-based regulatory framework, and it can be generic that can apply to any reactor design, including all the G4 reactor that's proposed by DOE, including the gas cooled reactor. It can be design-specific for a specific plant like gas cooled reactor GT-MHR or similar plant, like all gas cooled reactor, PBMR, GT-MHR. It can be a combination of the above. We believe if we develop that program, the Agency will make its requirement transparent to the designers so they can incorporate this information in their design at the early stage rather than during the review process when you try to identify exemption and new rules which can result into a backfit of the plant. So it is an important issue, but, again, I want to emphasize that we can use the existing process. If we have a gas cooled reactor right now, we can use the existing framework.

On Slide 24, regardless of the framework that we are going to use, whether the existing one or the future one, we believe that the Core Damage Frequency and the Large Early Release Frequency, which were developed for light water reactor, are not applicable to gas cooled reactor. For example, the definition of Core Damage Frequency for light water reactor is when the peak temperature is exceeded or when the water level drops below the top of the active fuel. For a design like the PBMR, the fuels can withstand very high temperature, up to 1600 degrees for high for a long period of time. So heat challenges to the gas cooled reactor is not a significant one, so we really need to look at different definitions for gas cooled reactors.

On the other hand, if you look at the fission product again, gas cooled reactor will release very limited fission product at very high temperature. But if you have defective fuel and it releases fission product during normal plant operation, this fission product can be deposited on surface, it can airborne with the carbon dust, it can be absorbed by the graphite itself. During a pressurization effect, all these fission products can be resuspended and released, so we have not deal with issue like that. So the definition of LERF does not apply here again. So that's why regardless of the option, whether new regulatory framework or existing framework, we have to develop a new acceptance criteria for the gas cooled reactor.

Slide 25, to help the Commission with the policy issue that I discussed earlier, we are going to provide a separate memorandum to the Commission discussing some of the technical issues and we chose shows five technical issues. I've only listed here three, but we are choosing five technical issues that correspond to the policy issues. For each issue, we tried to identify what is the safety concern, what's the data that we are seeking to get and how we are going to use this information in the licensing process. This paper is also due to the Commission in June of this year.

So I would like to conclude by saying that we have done enough work in the gas core reactor and we are going to provide you with a list of the deliverable here. The first one, in June of this year, is the policy -- status of the policy issue and technical issue. And as Jim indicated, as part of the risk-informed regulation implementation plan, which is coming to you June this year, we are going to identify our process of developing the risk-informed, performance-based regulatory framework, and it can be part of an existing framework that looks at the coherence of the NRC regulation.

On Page 27, again, a Commission paper in August on the modular and merchant plan. In September, we have another Commission paper on the NEI petition, and the final recommendation on the HTGR policy in the fall of 2002. As I indicated -- or Jim indicated earlier, we developed an advance reactor research program. We had one meeting with the ACRS. We're planning to have another meeting in July of this year, and then we'll work with NRR and NMSS about finalizing this plan, and we'll be sending it to the

Commission in the fall of this year.

So that concludes my presentation.

DR. PAPERIELLO: That concludes the staff's presentation.

COMMISSIONER DICUS: Okay. Well, I'd like to thank the staff for your presentation and enlightening us on some of these things. I was relieved when we got to Slide 27, not only because I'm beginning to run out of time but I was looking at Slide 26 thinking we commissioners are going to have an extremely busy June. So when we got to Slide 27, at least some of these papers are coming in in the fall, and I appreciate that.

As I mentioned in my opening statement, I do have several questions, but unfortunately I do need to leave the building shortly, so I won't go into them. I will submit them for written response and as a matter of record for this briefing and certainly with copies to my colleagues on the Commission on what those issues are.

Again, thank you, staff, very much, and at this point, I shall be turning the gavel over to Commissioner Diaz.

COMMISSIONER DIAZ: Thank you, Commissioner Dicus. Welcome again. I don't know what order that we have. Anybody keeps track of the order?

COMMISSIONER DICUS: I don't know what the order was.

COMMISSIONER DIAZ: I don't know the order either. All right. It doesn't matter that much. Well, let me take a crack it then so that we can get going. Again, thank you, and that was very interesting. I see that we have a few things coming our way, and I'm very happy to know that.

Off the top, and starting from the end, it seems like all of these things are coming, and I heard a moment ago one of the things that I personally like very much was just integrating things and doing them together rather than piece-wise. Decisions that will have to be made on these issues, has the staff considered that some of them will depend on each other, both from resources considerations and how they come and how are they related? Will the staff give the Commission some heads up and let us know what decisions are tied in? Anybody?

MR. LYONS: Certainly. We'll be trying to keep you informed of how everything works together.

COMMISSIONER DIAZ: Okay. Because that certainly might be important, as so many of these issues come --

MR. COLLINS: Commissioner Diaz, I think it's important to note that some of these, as Farouk indicated, have long lead times because they are product lines that are not formally endorsed yet by the industry or other stakeholders. Whereas some of them perhaps will be more integrated decisions because they support product lines. Therefore, we'll have -- a schedule will be developed by Jim in concert with research in order to support a definite process, like ESPs or potentially the AP1000 if it were to go to the COL stage.

MR. THADANI: Commissioner Diaz, if I may just comment on that similar topic. Indeed, as Sam said and Jim said, our intention is to make sure we look at all these issues in some integral fashion. But in order to do that, it is essential that we know what the target is. And what I mean by that is if you look at the Commission's advance reactor policy statement, it basically says there's the expectation that the new designs will be safer than the current ones. That's the expectation. If you go to Part 52, under Part 52, it basically says it's a process-type rule but it says you should meet Part 52, look at operating experience, resolve generic safety issues, both medium and high priority, conduct a PRA, identify areas for improvement and meet the Commission's safety goals. These are pretty challenging issues if one were to go to non-light water reactor technology, because it is obviously very significant issue of what

do we mean by meet a set of regulations. Farouk talked about some challenges that need to be addressed as we go forward.

It seems to me, at the outset, in order to appropriately integrate these issues, one would have to have a sense of what is the level of safety, what's the target? It is our intention to highlight these issues in the upcoming papers, because as I said at the March 19 brief on research programs, I really believe it will take a fair amount of intellectual capital to make sure we have talked this thing through completely as we go forward. So it is our intention to lay these issues out, and I think the fundamental issue is going to be what is our expectation?

COMMISSIONER DIAZ: Okay. I certainly think that you're absolutely right. Now, pouncing on that issue, the question comes of whether we can maintain the same pace or similar paces for both the graphite and the light water reactors. Can you give us an idea of these parallel tracks with interactions or whether they're completely separate? Because from what I am hearing, and I understand they're two complete different beasts and there are many, many, many different issues, are we separating them in a manner that from the point of conducting the work -- I know that we can visualize the difference -- but from conducting the work they are in independent tracks? What is the -- is there some synergism between them?

MR. THADANI: I can certainly speak from research perspective. I think we see current plans for focus more and more on the non-

light water reactors. Certainly the high temperature gas cooled reactor was where the majority of the focus was. And it's only been recently, as you have heard, that the significant interest has been shown by Framatome as well as GE.

The expectation issues for the light water reactors are easier to deal with. I think many of the technical issues are easier to deal with in the light water reactor, as Farouk has indicated. I think it's clear -- at least in my mind it's clear that for the non-light water reactor there is considerable long lead type of work that needs to be done. A significant part of that has, in my view, and I think Farouk will support this, has been done for the light water reactor technology. But I think we've got to recognize where we're starting from in the non-light water reactor technology. And as you know, and as you've heard, there are some very significant issues there, with the graphite technology, the kinds of temperatures we're talking about, the type of fuel and fuel kernels we're talking about.

So if you were to look at the two, I would say we have to recognize where the starting point is. It's a little clearer in the case of light water reactor technology. It's also clearer, I think, in terms of expectations. And containment, confinement issues really raise some fundamental issues of defense in-depth. How do we go forward? So we are looking at the issue, and we've laid out, we've indicated in some of our internal discussions the kind of resources it would take, the level of effort, the time line that it would take for us to make sure we have developed the technical basis. And I think we see that as a longer effort for the gas cooled technology and a shorter effort for the light water reactor technology, like ESBWR and SWR.

COMMISSIONER DIAZ: One comment, for the record, Dr. Eltawila, when you talk about the fuel for the gas cooled reactor, you said the fuel will take 1600 degrees fahrenheit.

DR. ELTAWILA: Centigrade, sorry.

COMMISSIONER DIAZ: And the record is corrected.

MR. COLLINS: Commissioner, I'll let Jim speak for the licensing and review process, as far as your question on the pace for the reactor.

MR. LYONS: I think one of the things we try to do is to look at what applications are in front of us and which ones are coming in. We've tried to separate in the pre-application reviews research as taking the lead on the non-light water reactors, and NRR has taken the lead on the light water reactors. But at the same time, we work together to keep ourselves moving together at basically the same pace.

But as we go through our budgeting process, we're looking for product lines that are going to proceed, try to give priorities to those items that look like they're going forward and would lead to an ultimate combined license application. Certainly, the early site permit reviews take us that way, design certifications take us that way. So I think that's -- we're trying to prioritize the work so that we take those product lines forward at a rate that would meet the industry needs.

MR. COLLINS: The definition of the programs, to a large part, will define the schedule for us. So, for example, the early site permit meeting of yesterday was our first foray into defining what is necessary in order for the staff to conduct a review. That will be laid out into a review plan, and that review plan will have a schedule and be budgeted for resources. It's premature right now to lay that out in front of the Commission today, but that clearly is our goal, similar to what we've done for license renewal.

COMMISSIONER DIAZ: And since we're talking about timelines and lead times, which are very important from many, many respects, have the staff been able to take a first estimate of the lead times that will be required to complete whatever regulatory work needs to be done for the advance light water reactors and for the gas cooled reactors? Give me an idea of what the lead times we're talking about?

DR. ELTAWILA: For the gas cooled reactor, the lead time right now we're talking about five years to be able, for example, to get the fuel and then destructive testing and measure fission product and so on. So as a minimum, we need five times before we can have this information and put it in our code and assess the codes and be able to provide the regulatory guidance.

For the light water reactor type of all the designs that we have, we really believe that the two years that, for example, we are proceeding with the AP1000 application, is adequate for the other, because we have -- the facilities are existing, whether it is in the United States or overseas, so we don't have to develop new facilities. And the fuel is not a major issue. The biggest two issues that driving the gas cooled reactor are the fuel, the high temperature material, graphite, and adaptation of our codes to be able to do gas cooled reactor. We are not going to develop any new codes. We are changing the codes that we have to be able to do these things. So all of these are taking -- that takes the longest time.

If I may add, we are at a very good opportunity here, because the rest of the world is performing gas cooled reactor research -- China, Japan and European communities. And they are all interested in engaging NRC, but we have to be engaged on almost equal footing, that we have to provide something. And if we take a leadership role in this international activity, we'll be able to direct them in complementing each other, rather than duplicating results. So we'd like to be able to participate so we can take a range of conditions and place it in Japan, another one in the United States and China and so on, and exchange the information so we can shorten the lead time we need to collect all this information.

MR. THADANI: Commissioner, if I may add to what Dr. Eltawila said. We've made progress in the HTGR because of our interactions with Exelon, so we've got a better sense of what needs to be done. The whole idea behind the pre-application review is to make

sure we have laid out an appropriate road map and there's a clear understanding about what the expectations are on the two sides.

In the case of ESBWR and SWR 1000, of course, we have not gone through that process, and we will have to go through that process to make sure that we have really understood what the key elements are, besides this general discussion that we're having, in order to be able to lay out what is it that one would have to do. And we're not there as far as those designs are concerned.

COMMISSIONER DIAZ: Okay. Thank you. I think we're not going to have time to get into one of my favorite issues, which is ITAAC. I'm going to let that go.

MR. COLLINS: Oh, we could probably get into that.

COMMISSIONER DIAZ: I have full confidence that my fellow commissioners will get into it. Let me just -- one thing that you said about codes, is it on track?

DR. ELTAWILA: It is on track, and we expect to have it at the end of this year as an internal version for to be able to use it and assess it.

COMMISSIONER DIAZ: So are we coming to a relatively final phase on grading these codes to be able to use them? I mean I know we'll always be --

DR. ELTAWILA: Yes. The answer is yes, and we'll always have to do changes, for example, to adopt to the new technology and so on.

COMMISSIONER DIAZ: And last, but not least, people of mine, the Commission has been saying for years that we'd like to talk about risk-informed and performance-based, so you will have the flexibility to do one, the other or both. I keep seeing that you guys keep coming with risk-informed, comma, performance-based, which means it's a singular approach. If I may suggest that you look back and realize that it's risk-informed and performance-based that we're talking about, unless we have a new regime that I don't know about. So it's five years. I think by now you guys should really get on it and realize what the Commission has been saying. Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: Thank you, Mr. Chairman. I'm going to start with the early site permit process. The initial three applications are all going to be at sites where there's existing reactors where more than the existing number of units was originally thought to be placed at these sites. So they're fairly well-studied. The three issues you have to look at are environmental impact, site suitability and site emergency plan. The site emergency plan is presumably straightforward at existing sites. They'll just work off of existing emergency plans and presumably describe that. Why can't we get this review done in 18 to 24 months -- 18 months without a hearing, 24 months with a hearing? Given the limited number of issues in an early site permit, given the sites or existing sites, given the sites are fairly well-studied, why not set an aggressive schedule there?

MR. LYONS: I think the best way to answer that is that in all these sites they originally had construction permits for more than one unit, but those construction permits were permits to allow them to build that plant at that site. It really didn't approve the site. So there wasn't a site approval process that's envisioned as part of the early site permit. And so we still have to go back and we do expect to be able to use the data that was generated before as part of our review. It has to be updated where necessary. If our regulatory requirements have changed since the time that they developed that data, those things might have to be addressed. But we still have to do a complete environmental review, complete site suitability review and look at the emergency planning. And I agree with you that the emergency planning should be one of the easier ones to do that on. So that's part of the process that we're working to develop.

But if you look at the environmental review that was done for license renewal, which fits in within the time frame that we're talking about, that really only looks about a third of the environmental issues. The other two-thirds were addressed generically as part of the generic environmental impact statement. And we're going to have to address those things in individually on each one of these plants. That shouldn't really stretch out the review, but it's going to make the resources that we require to do that review greater to address all those issues.

MR. COLLINS: I think we agree there will be some efficiencies, we'll be looking for those. We're not ready, prepared yet, I think, until all the process is laid out to say exactly what that will gain in the process.

MR. BURNS: Commissioner McGaffigan, I might also point out that with respect to the ESP this involves the mandatory hearing provisions of Section 189. Now, what that means really in implementation means the nature of the contest. I mean in the '60s, there were plants where there was a hearing and it was basically the applicant and the staff had the hearing that were, in fact, otherwise, quote, "uncontested." But there is a hearing process associated with that. It's just that it's really a question of what type of timing either the Commission sets in its scheduling and in kind of a scheduling order or the Board, depending on the nature of the parties and participants.

COMMISSIONER McGAFFIGAN: So a mandatory hearing is required here, which puts it into the 24- to 27-month time frame, in my mind. I mean it strikes me that -- and I'll go on, you'll see the rest of my line of questioning -- the ESP applications are real. A lot of the rest of this stuff that you guys are expending resources on may prove illusory. I can't imagine -- well, I might as well just get onto it, I can't imagine that we're going to build all of the above in the way of modular high temperature gas reactors, SBR 1000, European boiling water reactors, AP1000s, AP600s, the three that we already -- the system ADPlus, et cetera.

At some point, in order for the economics of this stuff to work, the industry is going to have to get into a situation where they're building multiple units, and they're going to have to settle on one or a maximum of two designs, I would think, realistically. And I know everybody wants to -- if I were a designer, I'd want to be in the queue as a candidate for them to think about. But, realistically, I think there's going to be one or two.

It would be real helpful if the industry could tell us earlier rather than later which ones they're really serious about rather than expend a lot of our resources on several things. And, therefore, I worry about your PPDM process, because my preference would be to continue to work on what I judge to be real things and push back some of the stuff that maybe isn't real. And maybe you're going to have to come to the Commission with your PPDM changes in order for us to understand what the rationale is. You're going to have a large sum of money, $25 million, if the Congress gives us our request next year, to slosh around among these various activities. I mean you have a plan at the moment, but as you make changes within that $25 million, I think we're going to have to be able to see what -- those are going to have to be transparent to the Commission.

MR. COLLINS: We would agree with that, and although it's premature to indicate in any way the budget that will be presented to the Commission, it does contain contingencies with that type of a strategy. It's hard in the licensing and review area, at least, for us to commit resources to product lines that have not been committed to by the industry. I think research has a little different situation because of long lead time, and clearly those funds are necessary, to a large extent, in order for research to perform their mission.

COMMISSIONER McGAFFIGAN: The long lead issue gets to the -- the main reactor that you need the long lead money for is the GT-MHR, as I understand your response to Commissioner Diaz. At the summit last week, there was -- between the President and the Russian leader, Mr. Putin, there was, I thought, a fairly strong indication that we were potentially going to help them use their BM 800 as a plutonium burner for the Weapons Plutonium Disposition Program. And that the effort that's been ongoing sort of in a low-cost way in both countries to look at the GT-MHR for that application may have taken a bit of a hit last week. Do you have any sense as to what DOE may be up to with the Russians or the U.S. Government may be up to with the Russians and whether the GT-MHR effort may -- the Russians have always wanted to do it with the BM 800 -- whether this is adverse to General Atomics, what happened last week in Moscow?

MR. THADANI: I can't address the fallout from that discussion of last week. I did talk to DOE as recently as yesterday. I talked to Bill Magwood, and his comments to me were basically twofold, and it may be a question you might want to ask the next panel as well.

COMMISSIONER McGAFFIGAN: I intend to.

MR. THADANI: His comments were twofold. He said HTGR technology is very, very important for the country, was number one. Number two was he thought it was important to move forward, particularly in the area of fuel, because, as we've been saying, that is probably the long -- really the tough long lead item. And that he thought that we may get -- the picture may clear a bit come September/October time frame. That was about the best intelligence I could get from him.

COMMISSIONER McGAFFIGAN: Well, I think we're going to -- as you all said in one of your slides, it's a very uncertain environment for these various designs, and we're just going to have to adjust. But to simultaneously have all these design certifications underway we probably are, realistically, unless Congress wants to appropriate us a lot of money and the industry wants to pay all the fees associated with all that money, it would be nice to sort out where -- which of these are real and which aren't. And it's my ingoing position, presumption is that they're not all real.

DR. ELTAWILA: Commissioner McGaffigan, if I may add to what Ashok said. The impact on GT-MHR in this country might be significant because GE indicated that they are going to rely on a lot of tests that's going to be done in Russia to support the certification here in this country. So if these tests are not going to be done in Russia, then they will have to do it somewhere else.

COMMISSIONER McGAFFIGAN: Well, I may be reading more into the summit statements than is appropriate, but I saw a clear signal that we were going to be willing to work with the Russians on what their preferred course has been all along. And if that is the Administration's position, then I think it could be adverse.

The last issue, I don't want to disappoint Commissioner Diaz on ITAAC, but I also don't want to take too much time, the Programmatic ITAAC, which programs -- again, if the three sites prove to be the sites where we some day get a call application, they already have programs for the existing reactors at those sites. If we want acceptance criteria for programs, which programs are we going to have acceptance criteria for? Is it all programs?

MR. LYONS: No, not all programs.

COMMISSIONER McGAFFIGAN: Okay. So it isn't all programs. Which programs?

MR. LYONS: We're going to have programs that we were not able to make a final finding at the combined license stage. Obviously, if somebody had a program that was in place and operating and we can make that finding at the combined license stage, then we could make that finding without an ITAAC or a very simple ITAAC.

COMMISSIONER McGAFFIGAN: You don't mess up during the construction period --

MR. LYONS: Right.

COMMISSIONER McGAFFIGAN: -- in running your maintenance program or something.

MR. LYONS: And so one of the things we want to work with industry on is to define those programs that we would see the need for Programmatic ITAAC on. But it kind of depends on information that they supply and the programs that they have in place at the time they come in for a combined license. And so that's when we would see us working through that process, similar to what we did with the design certification process when we developed the ITAAC for them. We had a process by which the industry proposed ITAAC, we worked with them, we interacted with them to come to a set of ITAAC that we agreed on. And there was a lot of give and take during those sessions. We spent weeks at General Electric in all-day meetings, in break-out sessions on various issues and then coming back and presenting the findings. It's not going to be easy to develop the Programmatic ITAAC, but I think we can do it and provide objective, or as objective as possible, ITAAC or acceptance criteria that would help the Commission make its decision at the time of fuel load to make that decision to allow fuel load.

COMMISSIONER McGAFFIGAN: I probably have teed it up for Commissioner Merrifield, so I'll let him continue, since he promised he was going to get into ITAAC as well. I really am interested in which programs, and I guess you're saying it's going to take a long process to figure out which programs and what the acceptance criteria will be.

MR. LYONS: We listed several programs -- a number of programs in our paper. In those --

MR. BURNS: Excuse me, on Page 13 of the Appendix, associated with SECY-02-0067, they list emergency planning, quality assurance, radiation protection, fitness for duty, license to operate a program, containment leak rate test program, in-service inspection, physical security, fire protection, access authorization, training program, reportability program, maintenance rule and equipment qualifications. So that's --

COMMISSIONER McGAFFIGAN: That's their current thought.

MR. BURNS: Well, reconsideration include the following. That's what the paper says.

COMMISSIONER McGAFFIGAN: Included. It's the "include the following" that that's not --

MR. BURNS: It's not an exclude. I will tell you as a lawyer it could be more.

COMMISSIONER McGAFFIGAN: Coming attractions, right.

MR. COLLINS: I think it's important to acknowledge that the staff is proposing this approach, and it's up for Commission decision --

COMMISSIONER McGAFFIGAN: Right.

MR. COLLINS: -- in order to preclude the Commission being in a position where the construction and design ITAACs are complete and there is an obligation to issue the fuel load without the programs being verified. And at that point, if there's not a Programmatic ITAAC, then our options are to revert back to the classic enforcement scheme wherein we would issue an order or we'd have a 2.790 or we'd have some other type of methodology by which we would feel it necessary to invoke enforcement to confirm that the programs are appropriate. Programmatic ITAACs preclude that. So there is -- being that they're defined, being that they're met, being that that takes place during the course of the construction of the facility, then that judgment is passed and we go through the process of conclusion of those before the construction is completed. It's worthy of discussion perhaps --

COMMISSIONER DIAZ: I'm sorry, I voted several years ago against Programmatic ITAACs, and I'm enjoying this discussion right now.

MR. COLLINS: We're trying to enlighten you since that time.

MR. LYONS: We may have failed.

COMMISSIONER MERRIFIELD: Well, I'm not ready to say that yet, but I want to understand. I mean having given the list that is on there, which is admittedly quite extensive, and saying that that is an inclusive list, not an exclusive list, so there are others that could be included, what are you proposing as the criteria that you would use to say, "Well, this is in or this is out or we need this at all"? I'm just trying to get a sense of the thought process that the staff is using to determine this list and others that may or may not be included.

MR. LYONS: The criteria that we would use, and let me address the list, first of all. I guess you all are reading it different than when we put it down. We were saying we're considering these. We're not saying that all of these would be included. And, in fact, as we look through here, there are some of these that I could say almost categorically wouldn't, such as Equipment Qualification Program. In fact, in the ITAAC that we have --

COMMISSIONER MERRIFIELD: But you say that, "Under consideration including the following." That means what it means. You've listed them. These are those --

MR. LYONS: Right. We're considering.

COMMISSIONER MERRIFIELD: -- that you consider at this point.

MR. LYONS: But we're not -- but we also --

COMMISSIONER MERRIFIELD: Well, it's in the dictionary, but I mean you've listed --

MR. LYONS: You just took one off the list.

(Laughter.)

But the criteria that we would look at going back to the regulations and the necessary and sufficient and those programs that we felt we needed to verify were in place prior to the loading of fuel and those items that in those programs -- that would be within those programs that we felt needed to be verified prior to making a finding. So it wouldn't be even the whole program, it would be those parts of the program that we felt were particularly important to identify and to verify prior to the authorization to load fuel.

COMMISSIONER MERRIFIELD: Okay. Well, now having said that, and that's a fair answer, how do -- having made that determination and say, "Well, it's not every element, it's certain elements that we would need before fuel loading," how do you limit the subjectivity process so that you've got disciplined objectivity when you're determining whether the acceptance criteria have been met? You're saying, "We're going to pick and choose elements of these we feel are necessary before fuel loading," but if we go down that road that you're suggesting, how do we avoid, on one side or the other, the suggestion that we're being subjective and undisciplined in our approach to making that kind of a determination?

MR. LYONS: I guess the way I would say that is similar to what we did with the design certification ITAAC. We would have -- the industry would have proposed the ITAAC that they felt were necessary and that we would work with them and we would try to work out to be as objective as possible so that we didn't have subjective ITAAC to the extent that we can avoid it. There's always some subjectivity in some of these ITAAC, even in the ones that we agreed upon for the design certification for some of the reviews -- some of the issues that were addressed there. But what we're trying to do is to work with industry to come up with those ITAAC that would define that and make it so that they would know exactly what they needed to meet in order to have that program found acceptable.

MR. COLLINS: The alternative is important. The alternative, if I understand it correctly, is that the programs are described in the submittal by the licensee for the safety analysis, and we inspect to that, which also has some business risk for the industry and some regulatory risk for us as far as defining how much is enough, what type of inspections are done, when they're done and what acceptance criteria you're expecting to. So the Programmatic ITAACs are actually a level above the definition that would be normally provided if we were to just inspect. And it's agreed upon ahead of time, and it's verified.

COMMISSIONER MERRIFIELD: This is an interesting topic, and I'm certain to further explore as we go forward. For the sake of clarity, I intend on asking similarly hard questions of our next panel to give them fair warning.

I want to touch back on an area that both Commissioner McGaffigan and Commissioner Diaz have alluded to, and that's the issue of scheduling. On Page 14 in the slides, you mention here the various things that we have before us or potentially before us on uncertainties. I would add to that, not to make your burden even greater, there is some possibility and some consideration of our friends from Atomic Energy of Canada wanting to bring a "can do" design down here as well for this consideration, from what I'm hearing.

Now, all of that having been said, I understand where Commissioner McGaffigan is coming from: Gee, you want to work on those things that are most likely to actually potentially materialize, but certainly the ESP reviews we have before us right now. It strikes me that there's a tension, however, and that is as a regulatory agency, we are to be agnosticant in the matter of designs. We are to make a determination whether we find them safe or not.

Now, in other areas, the staff, I think, has done a commendable job, particularly with our licensing renewal program, and we have things lined up, and there's an appropriate match between the timing and between the staff resources necessary to make those reviews. I think, increasingly, there is a greater alignment with the power uprate program where we have more alignment in terms of understanding where it's coming from. Clearly, this is an area where there's a lot of work to be done, and I agree with the two commissioners who've spoken previously. I think it's going to require perhaps greater involvement on the part of the Commission to help you funnel that work so that it can be done in an appropriate manner, somewhat along the lines of what Commissioner McGaffigan says, "Gee, let's focus on those things which have the greatest likelihood of actually materializing down the road."

There's not a significant question that comes out of that besides to let you know where I'm coming from. I would say as an attendant issue, timing -- obviously, we're working with the Oregon -- the APEX reactor to deal with the gas cooled issues. The PUMA facility for Purdue is one we'll have to time as well. So this issue does have its overlap in research, and I think continued interactions is necessary there as well to make sure we get the resources necessary to make it all work.

MR. COLLINS: Commissioner, that's clearly our goal, just to respond to your comment. The offices are aligned in providing resources that are appropriate to meet the Commission mandate, and that Commission mandate is that the Commission is not an impediment to the application of technology or the licensing of a site or a technology on a site. And that is our focus. There is a lot of uncertainty in where and when and what is going to lead to those decisions, and that really is where we need to support the stakeholders and the Commission in order to focus those efforts. Clearly, we're not able to do everything. There's a lot of speculation out there about what is going to mature to a product line, and we have three applications now that are a reality, and we need to move down the road in concert with our partners in research to provide for the next step should it be put in front of us as a challenge. But that's our goal is to reach that.

COMMISSIONER MERRIFIELD: Well, it raises the possibility and the question for the Commission to consider, and that is we may have to form a queue. We may not be able to do things in the timeline that the applicants would like, simply as a function of the resources we have available.

Couple of questions real quick, and then we should get to the next panel. Mr. Eltawila, you mentioned in terms of gas technologies, that the NRC is looking to create a, I think you said, a leadership role in certain activities in the international arena so we could have our part that we can contribute internationally. Do you have any recognition or understanding right now what might be an area we could carve out in terms of expertise in this field?

DR. ELTAWILA: Our area of expertise would be definitely in the risk-informed, performance-based regulatory framework. The European Commission are interested in that, and they want to cooperate with us in this area. The other area that we can carve our relationship role would be in development. Our tools are the best. The experimental program, we can provide information for light water reactor, but for the gas cooled reactor, most of the experimental data will be coming from -- they are one step ahead of us in the fuel and the graphite area.

COMMISSIONER MERRIFIELD: Well, I think that's building on our high levels of expertise in the areas you mentioned. I think it makes a lot of sense. Clearly, as we have more enhanced international efforts, I think building on those relationships and taking advantage makes sense. This clearly, seems to me, to be a pilot program in the future for moving forward internationally with our international collaborators.

Last question, in the meeting we had last year, we talked about the challenges in obtaining personnel with the appropriate skills that could be involved in the review of these new license designs, and I would like Sam and Ashok, in particular, to briefly, very briefly, talk about progress you've made in this area.

MR. THADANI: Okay. I'm happy to report that we made, I think, considerable progress in the area of getting talent on high temperature materials area. We've got some new staff with good background and experience. We reached agreement with NII, and, as you know, Commissioner Merrifield, that we'll be sending a staff member with --

COMMISSIONER MERRIFIELD: Our UK counterpart, for those who aren't familiar.

MR. THADANI: Yes. I don't know if I had told you this, but we do have a staff member now at Research who has a fair amount of background in graphite technology. So that's been a success. We just want to bring this person up to date in terms of what's really happening with the current evaluation that UK is conducting.

COMMISSIONER MERRIFIELD: So the bottom line is that you have reduced the gap between the needs and the skills.

MR. THADANI: Right. Now, I think the area that still needs attention is the fuels area still needs some attention, I think.

COMMISSIONER MERRIFIELD: Sam?

MR. COLLINS: Thank you. We have challenges also. I think we've made some progress, particularly in staffing Jim's organization for new licensing. As was indicated an issue in my opening remarks, that's an exciting area and people gravitate to that. We do need experienced people there, as we are going through a licensing process that requires mature judgment and some background. So people have tended to gravitate to those program and process positions, and I think we can be proud of the team. There are holes where they have been, and we're continuing to fill those. We have a fairly aggressive hiring program that has success with new hires, entry levels and interns, less success with mature workers, if you will, that can come in at the upper grades. There's many challenges, and I think the Commission is going to have a meeting in June to talk about human capital, and we can get into the details there.

Technically, our challenges, as Jim would indicate to me, and he can elaborate, are in the ologist and urgists, if you will, the people who are necessary for us to provide for the early site permits and some of the structural areas which we have not been making regulatory decisions in a large way in the past ten to 15 years, as well as in the environmental area, and we're continuing to work on those challenges.

COMMISSIONER MERRIFIELD: Thank you. Thank you, Mr. Chairman.

COMMISSIONER McGAFFIGAN: Mr. Chairman, could I just ask one -- I think it would be a quick question and a quick answer. The fees we get to pay for this program at the moment, could you just briefly outline who pays? Are we collecting any Part 170 fees from anybody? Presumably, Westinghouse now that they've gotten to the stage where there's a design certification they're paying

fees, 170 fees. But all this pre-application stuff, almost all of it, including the research related to the pre-application stuff, is done out of 171 fees; is that correct?

MR. LYONS: Not really, no. We put in place project numbers for the pre-application reviews, and we charge Part 170 fees for the part of the pre-application review that's specific to the design. If there's areas that are more generic in nature that we're addressing through the pre-application review, those would then be in the Part 171 fee structure. But for those plant-specific issues, we are collecting Part 170 fees. We had a discussion with the early site permit applicants yesterday about fees, and maybe they'll want to address that some more, but they're looking for some relief in the fees areas as being the first wave of applicants that are coming in.

COMMISSIONER McGAFFIGAN: I thought DOE was paying half their costs. Okay, whatever.

MR. LYONS: Ask them.

COMMISSIONER DIAZ: All right. Thank you very much. I think we see that at least these three commissioners are very concerned that the combined license process be fair, equitable, clear and predictable and also transparent to our stakeholders. So that's one of the things that we're really very concerned with.

And a final comment, I think there is obviously a tug of war in hearing what goes first. I think we need to do things that needs to be done first first. Isn't that a profound statement? But there is no doubt that we also need to be looking at the future, and therefore at some efforts that will continue in that regard are fine.

And we thank the staff and we have our next panel coming and move in and we'll try to get on with a prompt discussion of the issues on the second panel. Thank you.

Well, we need to -- we're a little late, so we're going to need to be moving on. Welcome, second panel. Dr. Kress, ACRS; Marv Fertel from NEI; Jim Riccio, Greenpeace; and Mr. Grecheck of Dominion. We'll start right on. Dr. Kress, please.

DR. KRESS: Thank you, Commissioner Diaz. We might as well start with the slides. I am going to make some comments on the new reactor licensing activities. I want to stress that these are not ACRS views; they're my own personal views. The ACRS has not passed judgment on these, and we have no official position.

That said, on my second set of slides, my views, although they are my own, have been somewhat contaminated by activities of the ACRS. I am the Subcommittee Chairman of the Advance Reactor Subcommittee, and we have had some activities there. And as Jim Lyons noted, we're coordinating our activities with the staff to be sure we can accommodate their needs for ACRS reviews.

The advance reactor licensing was a major topic of discussion at our last retreat. I led that discussion myself, and two members of the ACRS did attend the staff's workshop on high temperature gas cooled reactor safety and research issues. That may be, in part, why I'm here today.

My views I want to express today are that I think the new design technology reactors are quite good, some of them, and they do have the potential for an increased level of safety and better economics, and I think they are immanently certifiable.

This certification, ACRS believes -- very much like I think we heard one of the earlier speakers say -- there are possibly two routes that they could take. One is the PBMR example in which they try to fit into the current regulatory structure but with exemptions and risk-informed modifications.

I believe that AP1000, IRIS, and each of the gas-cooled reactors, and the other lightwater reactor concepts -- EES, BWR, and SWR1000 -- probably will go that route because it seems to be the route that is the easiest for them to fit into.

Some of the concepts might find it advantageous to wait for a complete recrafting of the regulatory system to be risk-informed and technology neutral. Regardless of which of these routes that are chosen by the applicants, I think there are a number of technical and policy issues that will have to be faced. And I did want to talk about three of these -- two of them, really.

I think in doing a risk-informed review of these, or risk-informed modifications to our regulations, we have tended to focus on CDF and LERF as our risk acceptance metrics. I think those are very good -- a good start. But I think they are basically insufficient. They're not complete. They may not be applicable to the gas-cooled reactors as defined currently, and they might need additional definition as mentioned by Farouk.

I think in the regulations, as a body, we have other objectives. The siting criteria tends to think about the total number of deaths by limiting populations around the site. The EIS gets concerned about land contamination and other things of that nature.

The safety goals have, in addition to the prompt vitality safety goal, they have the latent fatality safety goal, which is -- tends to be a late containment failure issue. Things like 10 CFR 100 and the steam generator tube rupture focus on smaller releases that don't lead to deaths, but lead to injuries. And then we have things like worker exposure and things of that nature, and those are important regulatory things that we must keep.

And when we go to risk-inform our regulations or have a risk-informed review, I think we need to preserve those in some way. And one way that the ACRS has suggested that these might be preserved in a single set of acceptance criteria is the concept of frequency consequence products, where the consequence may be fission product release, may be dose, may be things of that nature, but we have suggested that this would be one way to cover the whole range of frequency and consequence effects in one set of acceptance criteria. And we think that ought to be pursued.

I am currently trying to work up a white paper for ACRS on the subject, which would try to make these consistent with the safety goals and with the regulations that we now have and making it consistent on the basis of cost. But I'm not prepared to talk about that today, but it's one thing the ACRS is working on.

Other policy technical issues I think are important are the defense-in-depth, how do we set necessary and sufficiency limits on it, especially for the new technologies like the gas-cooled reactor concepts where the containment may not be -- you can't decide whether containment is good enough by using the current design basis accident specification for containment. It just doesn't seem to be applicable.

I won't say too much more about that, because ACRS has talked about that subject in great detail. I would like to say a few words about the design basis accident concept.

In lightwater reactors, I think it has served us well. It has resulted in a level of safety that I think is acceptable, and it is a convenient way for designers and applicants to do their SERs and their safety analysis reports.

And they might want to preserve a sort of design basis accident concept, even if it's risk-informed. And the question that has come up a number of times is: how do you select design basis accidents for the new technology concepts? I mean, we have a set for LWRs that seem to work pretty well, but how do you go about doing it for the new technology designs?

I'd like to suggest a way, and I always like to start with a philosophy. And my philosophy on design basis accidents is that you select a set of accidents possibly based on the frequency of initiating events, and then you determine a set of safety provisions to accommodate those by the regulatory acceptance criteria. You have to have acceptance criteria, and you have to have design GDA -- GDCs to tell you how to deal with them.

But once you do that, then the idea is that those accident sequences that weren't in the design basis, which were excluded, beyond design basis, are also dealt with to some extent by these safety provisions and to the extent that you meet an overall set of risk acceptance criteria.

Now, given that as the philosophy, there is probably a logical way to approach selecting DBAs. First, you need a preliminary -- some sort of preliminary design concept for your reactor, which most of the time you have. You don't have a great deal of design information so that you can do a full PRA, but you can identify initiating events, and you can make an estimate of frequency of these.

Given that set of information, you could arbitrarily choose a cutoff value, and it could be arbitrary. You could guide it by certain guidance, but it could be arbitrary. And then you develop your design according to these DBAs using the normal type of DBA specifications.

And once you have a design to meet those design basis accidents, then you can develop a design-specific PRA for that design and use that PRA to see if you can meet your higher level frequency acceptance criteria for the full range of consequences.

If you don't meet them, then you go back to your arbitrary selection and you lower the frequency. If you meet them well, you could actually up the frequency, cut it off at a higher level and have some relief on design things. But you would iterate on these items until you got a system that worked, the design basis accidents that are put together, and you meet high-level risk acceptance criteria with the PRA for that design.

Now, that means you have to have two things. You have to have a PRA for the specific designs that has to be acceptable, and you have to have design -- you have to have risk acceptance criteria, and these risk acceptance criteria cannot be just CDF and LERF. They have to cover the whole range of frequencies, I think.

So that's basically the comments I wanted to make today.

COMMISSIONER DIAZ: Thank you, Dr. Kress.

Mr. Fertel?

MR. FERTEL: Thank you, Mr. Chairman. I'll try and be brief, since I know you have questions.

Let me start by saying that what I think the previous panel demonstrated is the breadth of activity that the NRC has ongoing right now, and from the industry standpoint we appreciate the commitment that the staff is making, that the Commission is making. I think we fully understand the problem that you have and what the priorities might be.

We see the same thing on our side, obviously, and we'll do everything we can to try and help in setting priorities and also in fulfilling our side of the obligations. I think there is some natural select that will occur. Commissioner McGaffigan asked who is paying.

Well, that will be a natural selection process as you move through this, because as licensees want something and have to put for it it will determine how aggressive they're going to be. And I think we'll see that happen, in all honesty, as you go down the process.

If we could go to my second slide, please.

The other thing I noted -- and I think Commissioner Dicus did, too -- is that you're going to get an awful lot of material to read in the June timeframe, and I know you already have a lot of material. You might want to take some speed-reading courses or something, because I'm not quite sure how you're going to get through all of the stuff. And what we talk about today on this list also will add to you.

If you could go to the next one.

Sam mentioned the meeting yesterday on early site permits. We thought it was a very good meeting. We think that actually the staff and the interactions that they're having with us and other stakeholders we think have been very good, open, and useful meetings trying to identify issues early and disposition.

On the early site permits, you have three of them -- you have Gene here, who is going to talk about his particular situation -- all three applicants are working with us to try and make the submittals as efficient as possible. We're going to try and come up with guidance templates so that the submittals look basically the same, to the degree they should, as far as both scope and level of detail. And we're going to try and disposition as many of the issues that we can generically.

So from our standpoint, we'll work with the staff and the applicants to try and get through that. I think that from a schedule standpoint I think the discussions yesterday started a discussion on what type of schedule makes sense. We understand that hearings are going to be in the game. That's fine.

We think that those can go just fine, but we think that whatever we can do to make the process more efficient we should try and do. We're trying to bring certainty to the process, so that the people that follow can learn.

Next? Next slide, please.

Going to a subject near and dear to everybody's heart -- ITAAC -- on this slide I don't get to programmatic ITAAC yet, but let me start with another aspect of ITAAC that is of equal, if not more, importance to us, which is finality in the sign as you go part of the ITAAC process.

I'd like to make two points here. Our philosophy on this and our proposal on how the staff can sign off -- and I think we may be converging on this -- is actually predicated on what's been done in three design certification rules. We're not asking for any more or any less in the terms of finality. What's done in the rules we think was fine, and that's what we're asking for in the COL ITAAC.

So it's already the precedent exists, the Commission has done it three times, and we're saying just pick up that, adopt it, and go forward. And that's what we would like to see, and I think we may be converging.

The second point I'd like to make is that in no way are we saying that once the staff signs off, if new issues that are safety significant come up, they shouldn't be addressed. Obviously, they should. And that's -- there's no disagreement there when we've met with the staff, at least I don't think so.

So I think the two points I'd make is the precedent exists. Our words basically follow it. I think when we get the staff comments on our white paper in June it will provide us a basis for seeing whether or not we actually have gotten and converged on this particular issue. My understanding is we're making real progress towards that, and I hope that's true.

Next slide, please.

This slide opens up the issue of programmatic ITAAC, and I know we'll have a lot of questions on programmatic ITAAC. And let me just make a couple of points on that to just sort of tee up maybe some of the questions.

I don't think anybody on the industry -- in fact, I can say unequivocally nobody on the industry side expects that you're going to allow a plant to start up if the programs are not adequately there complying with the regulations. It borders on absurd when we hear that what you have to do is issue an order after you let us start up to review the programs.

We just don't understand it. Okay. We would not start up if the programs were not acceptable. You wouldn't let us; we wouldn't want to.

We see the COL as basically the place where you're making your findings on the adequacy of programs, and you need to verify

those. Commissioner McGaffigan's question to Jim about, what about at existing sites, it seems that existing sites, unless it's really an anomaly, all of the programs were in place, and they're being implemented.

So when you issue me the COL, unless I tell you I'm not going to use the rad protection program that's here, or I'm not going to use the security program, or whatever, you know what it's doing. The findings should be pretty simple, I think.

We also believe that when you go out on programmatic ITAACs what you really are doing is you're verifying -- and, again, Sam said, well, we'd have to get into enforcement, and I'm not sure it's enforcement. Right now, under Part 50, you basically go out and you do inspections on the programs. And when the inspections are done, the staff can write an SER.

And it's either okay or it's not okay to allow fuel load. It's not a lot different, because when I get my COL I am basically now sitting there with an operating license. And they ought to be able to implement a similar program.

And this is my own personal view from talking with some of the senior managers here, because they've asked the question, if you like the programmatic ITAAC -- if you don't like programmatic ITAAC, why do you like the other ITAAC? And I think it's sort of simple when you think back to the process we've been in. We didn't license any of the 103 plants we have with the design complete at the front end. We're now talking about either certified designs or fully designed plants when you issue a COL.

And you can implement an ITAAC to sign as you go. You couldn't have done that for any of our current plans. So ITAAC, sign as you go, actually is a good thing from a construction standpoint. In the words you constructed and it will operate -- well, I could look at that and say, "Yes. Did I build it with three aux feedwater systems? And did I test them to see whether or not they provide the flow?" That's how they operate. I built it with three. That's construction.

Now, will they perform the way I want them to? That's operation for the plant, the physical facility. We're used to programmatic reviews at the OL stage from Part 50. You do it all the time, and then you do it afterwards as part of the ongoing oversight and enforcement program.

So we're -- we understand how that works. And to the degree that you need to do that, we think you should do it the same way, and that's kind of what we argue in the letter that Joe Colvin sent in and other things we've sent. But I guess we'll explore that more as we get into it.

Next slide, please.

I know that you have the Part 52 rulemaking sitting before you. One key thing that we've emphasized when we've spoken with the staff was we understand it would be a lessons learned, and it would have clarifications, and there may even be cases where there may be policy changes that the staff thinks are necessary.

If they are policy changes from what exists in Part 52, we think they ought to provide a basis for why there's a policy change as opposed to a clarification or a lessons learned. And we understand that they were going to be doing that.

The other thing was -- Jim mentioned that they're going to get a paper to you in September as opposed to June on our petitions. That will be 14 months after we submitted those two petitions, and I think that's just in general, even with all the workload, that seems like a long time to decide whether you're going to go forward on a rulemaking on a request for petition.

These are particularly important because you now have early site permit applicants going in, and both petitions affect the early site permit applicants to some degree. Certainly, the one that addresses the need for power in alternate sites is relevant. Also, the use of the current licensing basis could be relevant. So we think that sooner rather than later addressing these petitions will be to both yours and the industry's best interest.

Next slide, please.

I think we're here today saying that the staff and the Commission, and we hope all of the other stakeholders including ourselves, have been working pretty diligently and cooperatively to try and make sure that the next set of reactors built in this country can be built with predictability, can operate really safely, and we want to look forward to continued NRC leadership in this role.

Again, we'll do what we can. We'll provide as much constructive input as we can. We'll try and answer your questions as best we can, and I think that all of us want to make sure that it's done safely and securely and efficiently, and I think that to date everybody is working towards that goal, even if every now and then we sort of stumble on issues that seem hard.

Thank you.

COMMISSIONER DIAZ: Thank you.

Mr. Riccio?

MR. RICCIO: Good morning.

COMMISSIONER McGAFFIGAN: Welcome back.

MR. RICCIO: Thank you. It's a pleasure to be back before the Commission.

I realize the purpose of this morning's meeting is not to discuss the wisdom of men that would construct new nuclear powerplants when we have terrorists targeting the ones that exist. But even prior to September 11th, in the marketplace of ideas, The Idea of Nuclear Renewal was selling for $2.98 on the remainder shelf.

This agency has spent a lot of time -- and it always frightens me when I agree with Mr. -- Commissioner McGaffigan, but there has been --

(Laughter.)

-- a lot of smoke going on here at the agency and very little fire. And it does appear that the -- you know, that some of these proposed designs are less realistic than might otherwise have been the case. And, honestly, I don't see why I and a lot of the staff time is being spent on them.

You know, over the past decade, this agency has systematically diminished the role of the public in the licensing of nuclear powerplants. However, you're basically addressing a problem that didn't exist. It wasn't public participation that caused the massive cost overruns in the first generation.

It was their inability to manage the construction and operation of these reactors that caused the massive cost overruns, which led Forbes to conclude that it was the greatest managerial disaster in the history of American business.

Unfortunately, public participation has been used as a scapegoat by the nuclear industry to blame them for this economic disaster. Additional streamlining in some of the proposals put forth by NEI is not going to improve the economic performance of these reactors and is only going to undermine public confidence in the Commission and in the industry.

And, actually, the irrational exuberance that I've seen displayed over these advanced designs is really surprising to me, given that we've had members of the ACRS questioning whether or not these designs are even certifiable.

It seems that the industry is caught between a rock and a hard place. Those reactors that have already been certified don't appear to be economic, and those reactors that appear to be even marginally economical don't appear to be certifiable under current U.S. regulations.

Now, that was according to Dr. Powers' reports, and I was actually expecting that he would participate in this briefing. I'm sorry to see that he wasn't.

As he pointed out, you know, there are many problems with the advanced designs, and I'm not going to go into all of them. The one that really leaped out at me, especially post-9/11, was the fact that pebble bed modular reactors are proliferation resistant. And, in fact, according to Dr. Powers, the pebble bed modular reactor is tailor-made for the facile production of weapons grade plutonium.

When you have rogue states and terrorist groups that are attempting to acquire fissile material to be used against this country, I don't see that we should be spreading this technology around.

The staff has been concerned, at least in the meetings I've been able to attend -- and as the Commissioner noted, I've only just returned to doing the work -- but I have been concentrating on the preliminary applications on the PBMR and also on the ESPs, on the early site permitting process.

And it seems the staff has been concerned about the voracity and the pedigree of some of the submittals from the industry. And after listening to Exelon's performance at many of the meetings this spring, I can understand why. Exelon claimed that the reactor has the pebble bed out of containment. And I don't mean to beat a potentially dead horse, but there were so many misstatements that I felt it needed to be addressed.

As Dr. Powers said in his reports, that's a confinement, not a containment, and we can debate that, you know, on into the future.

Exelon also stated that there were no accidents at the thorium high temperature reactor in Germany, upon which is -- one of the two designs upon which they are premising a lot of their preapplication work. In fact, the THTR was taken off line in 1986, after a fuel -- tennis sized fuel ball got caught in the annulus. It was blasted out by apparently a blow of helium.

It released radiation into the environment, something that supposedly wasn't supposed to happen with these fuel pellets. And basically they didn't -- it didn't work as advertised.

Of course, there's very little mention of this in any of the information that's been forthcoming from either the industry or the staff.

I'll admit that I filed a Freedom of Information Act request as soon as I knew I'd be presenting here today. And, unfortunately, I just got the first package yesterday. Not to beat up on the FOIA staff; they do an excellent job.

I have concerns, too, about the use of probabilistic risk assessment. And as the Commission well knows, I've been here before talking on that subject. And to my mind, it's an excuse to regulate the industry less and to inflict more risk upon the industry. And I'm greatly concerned, especially with the advanced designs, because you have basically no operating history.

I was concerned with the use of PRAs in regulation for the current generation, but at least you have a relatively, you know, substantive database. There is very little data on these advanced designs.

In conclusion, Greenpeace believes that the NRC's limited resources could be better spent assuring that the current generation of nuclear reactors does not pose an undue risk to the public health and safety. We're unequivocally opposed to the construction of new nuclear reactors and believe that the safest reactor is the one that's never built.

However, if you're going to continue down this road, there are things you should be aware of, that I believe your resources have been squandered by basically the -- you know, the pushing of advanced designs that may never come to fruition.

The streamlining of the licensing process is not going to improve the economics and is only going to push the public to the point where they feel they must be more demonstrative. And basically, you should really look into the history of the THTR and the other reactors that are purportedly being used as models for any of these new designs.

I thank the Commission for this opportunity to present our comments and would be free to answer any questions you might have.

COMMISSIONER DIAZ: Thank you.

COMMISSIONER McGAFFIGAN: Mr. Chairman, just as a -- Mr. Riccio didn't ask to put his statement in the record as if read, which I -- you know, he's the only one that gave us a detailed statement in advance, and it probably belongs in the record as a whole, and then his oral comments would follow.

COMMISSIONER DIAZ: We will be pleased to put it in the record.

MR. RICCIO: Thank you.

MR. GRECHECK: All right. Good morning. It's a pleasure to be back here. As several other speakers have spoken, we had this -- this briefing back in July, and at that time I remember sitting here at this table talking about a lot of speculation about what we might do and what we might consider.

And, certainly, there's been a lot of progress made in less than a year, so it's a real pleasure to come here and talk about that.

If you'll go to the second slide, the objectives of the project -- what we're calling our ESP project, which encompasses the entire technology review of possible future nuclear, this slide is still the same from what we had last year, because our goals have not changed.

We're still interested in maintaining the nuclear option. We are evaluating advanced reactor technologies, and I'll talk about that a bit in terms of where we stand on that. And then, finally, demonstrating the Part 52 licensing process, because in the absence of a demonstration we considered the uncertainties and the possible paths that could take place as just adding to the overall uncertainties of a decision as to whether future nuclear is indeed economically viable for our company.

The nuclear option -- we've been quite busy with that. If you go to that next slide, you can see that we've been participating in a number of NEI activities. We've also been working very closely with DOE on the Nuclear Power 2010 initiative, and we are also actively engaged with several of the potential reactor vendors on their utility groups.

Now, several of them have set up very formal utility input processes, and we are involved in most of those.

From a reactor technology standpoint, we are currently evaluating the entire spectrum. And this is the same opportunity and dilemma that the staff and the Commission faces, that there are -- every technology you look at has a number of very attractive features to it.

It also has uncertainties in terms of their ultimate operability and designability. And the fundamental point is is that at this point a clear business case for any one of those has not yet been made. So in order to keep the option open, we are forced, just as the staff is, to look at all of them and be juggling on a daily basis or a weekly basis where we think they stand, what their advantages and disadvantages are, continue to engage with the potential suppliers to talk about potential packages of how those could be presented. And, again, at the present time, we have not made a choice.

I understand the dilemma that the NRC faces, but when you ask the industry to make a choice I can only speak from the potential user perspective, of course, not the vendor's perspective. But we are not in a position to make a choice because many of the

factors that go into a choice come right back to the Commission in terms of the license ability and the technical adequacy and all those things. So it's like it's a circle that just goes around and around.

Although having said that, I will say that I think in just the time since last July, a great deal of information has been developed on all of the technologies, and we are moving in the direction of understanding them better, understanding a business case better, understanding how things could happen better, but there is still more to be done there.

Just to go -- we talked a little bit about accomplishments. Just since July, Dominion completed the site feasibility study. At the time we were here, at that time, we were saying that we were reviewing the Surry and North Anna sites. We concluded that both of those sites were indeed feasible as future nuclear construction locations. We did select North Anna as the preferred site for the early site permit.

We did inform the NRC staff back in April that we were indeed going to proceed with the ESP application. As I mentioned, we've been working with DOE. We did receive co-funding to evaluate feasibility of federal sites, which is a project we -- which is going on right now. We do have people out looking at three different federal sites as potential locations for future reactors, and we have a proposal pending at DOE right now to support the North Anna ESP application.

At the moment, we are preparing the ESP application for North Anna. As several people have mentioned, we had the kickoff meeting with the staff yesterday. I would also agree, I think a lot of progress was made during that meeting. It was a good -- it was a good point of starting. We're continuing to evaluate the DOE sites, and the technology assessment is continuing.

So with that background, let's talk a little bit about what we -- what I perceive as some of the challenges that we are facing as we go forward. And the first of those will lead into a discussion of schedule. It is a challenge to obtain NRC approvals in timeframes that support business decisionmaking.

And it's not necessarily so much what the actual timeframe is as a reasonable certainty that the timeframe that's advertised will indeed be met. If we agree that a certain process should take certain lengths of time, and then it doesn't, for whatever reason, as a result of resources missing or as a result of not knowing what the standards are and then having to come back and redo work that's already been done, that leads to further uncertainty in making decisions that we all have to make.

In the ESP process, there is a lot of guidance that we and the staff need to work on as to what those applications need to look like, what information is indeed needed, and how that information will be obtained. There's a great deal of guidance information out there that the staff refers to, but most of that information or most of that guidance was not developed for the ESP process.

It was developed for construction permit applications 25 years ago. There is -- there are references there to standards that have been since superseded. There are references to obtaining information as if it was a greenfield site, which clearly is not the case with the current generation of applications.

And, finally, I agree with Mr. Riccio that good communications with all stakeholders is important. It is certainly not our intent in any way to exclude the public from this process. That is not the objective. The objective is is to establish how that will happen, when it will happen, what information will be available, and then proceed with it, and not spend a lot of time in uncertainty.

From the schedule standpoint, we made this point several times, and I can't take the opportunity or miss the opportunity to say it again -- that we do have -- ourselves and the two other applicants are dealing with existing sites. Those sites were previously approved for additional reactors, but even more importantly than that they have been the site of ongoing operations now for 20 years plus.

As I indicated here, the NRC has inspected the North Anna site for three decades. You know, everyone is very familiar with that site, very familiar with the characteristics of that site. But even more importantly, there have been more recent licensing activities going on there which add to the body of knowledge that we have there.

We have a North Anna ISFSI license renewal -- we had a North Anna ISFSI license application which was approved within the last several years. The license renewal process for North Anna is getting to its conclusion. The environmental statement has just been issued, so there's been a great deal of work done that is very contemporaneous. It's not 20 years old. It's recent work.

It's recent activity that has taken place on that site, and we think that what we need to do now is to be creative in terms of using that rather than saying, "Well, it's a data source, but we have to enter that data source back into some, you know, from scratch process because we have information." The challenge is now how to use that in an efficient manner.

And the resources need to be there. As several people have said, we are dealing now with real applications. These are not speculation anymore. This is real. We are engaged, and we'd like to see the same thing from the staff.

The target schedule, as we continue to discuss, we're probably not that far off from what the staff is proposing. I think what we're asking for is that the discipline that we saw during license renewal be applied to the ESP process as well. And what makes that particularly applicable is that there are many, many processes that are parallel between what we have been through in license renewal and what we are about to embark on in ESP.

It's the same kinds of products need to be developed. We have an environmental impact statement. Obviously, a safety evaluation

needs to be provided. We have opportunities for public involvement in both, opportunities for hearings in both. These are not different.

So we can go back and look now at the historical experience with license renewal and say, "Well, what did it take to do these very, very similar processes?" With the recognition that license renewal was a discipline process. It was never allowed to simply drift and grow into its own schedule. We had a lot of agreement up front as to what that was going to look like.

So on the slide here called Target Schedule, what I've tried to do there is to -- is to just take some very, very high level bullets and say, "Well, what has it taken in license renewal?" Well, the process of issuing the SER -- and this is counted from date of application to the date that the staff was ready to issue the SER -- has ranged between 17 and 20 months. That's a pretty consistent performance over a number of applications.

Similarly, issuing the environmental impact statement has run about the same time. So when we try to develop what we think is a reasonable ESP schedule, we just pick a number that's, you know, midway between there saying, basically, 18 months looks reasonable.

If you look at that overall, that means 20 to 25 months, including a hearing process, is -- it looks reasonable. And we continue to believe that it should be better than that for the first generation, because the first generation has the benefit of having fully characterized sites with all of the experience. But even -- not even taking credit for that, 20 to 25 months does look reasonable.

COMMISSIONER MERRIFIELD: A little clarification -- on two of these, you've picked a mid range. With hearings, you picked the low end of the range.

MR. GRECHECK: The reason that we picked that specifically for North Anna is because our expectation is is that that's what we will see at the North Anna site. We believe we have a tremendous amount of public support there, and we expect it to be a relatively straightforward process.

As I said, this was a very high level chart. There's a very detailed comparison that we've provided to the staff at several meetings, and, you know, it goes point by point, not just issue the SER, but then, you know, point -- all the elements that go in that, and we've done this comparison.

As I mentioned, I think the NRC guidance is -- is there to some extent, but it's difficult to effectively use. It is in various forms that don't effectively tie in, don't integrate very well. Some of it is so founded in the Part 50 process that it clearly is going to need to be revised.

Some of the information that is in the construction permit application guidance tends to assume that you are specifically referring to a particular reactor technology. And if you don't do that, if you're doing the envelope approach, which we are going to be using, then some of that guidance does not appear to be directly useful.

And, you know, fundamentally, I think one of the end products of this initial round will have to be some more clearly defined NRC staff guidance as to what an ESP application looks like.

Now, we are pledged to work with the staff. One of the reasons that we have committed to work with NEI and the other two applicants to basically submit a common ESP application is that we think that it is the most effective use of resources.

I just want to make sure that we understand what we're talking about here. We are saying that all three applicants will agree with the staff up front as to what an adequate QA program is, for example, and then submit the same thing. We are going to agree what adequate seismic information is, and then we're going to submit the same kind of information.

The applications will look the same. So this is not going to be three independent applications that the staff has to devote three teams to -- independently to review and issue -- and hassle out the technical issues separately.

We are going to be dealing with one body of technical information, one body of requirements, and the final product will be very, very common with the -- obviously, the site-specific details called out. But it is really intended to say, "We've got one application with three subsets," rather than three separate application processes.

Now, recognize this is -- this is not new -- I mean, this is new. This is not conventional practice, but I -- we are saying that we think this is an efficient way, from both the industry perspective because we're not going to be having one applicant out there blazing the trail and then having somebody come back right behind it and say, "Well, no, we don't agree with that; we want to try something else," and then have to go into an iterative process.

And from the staff's perspective, we think that we can debate the issues once and then put them to bed.

With that perspective, though, I know we were talking about fees before. We do think there's a lot of generic work being done here. And to the extent that generic work is being done that is either leading to guidance preparation or setting standards, we do think that there ought be consideration of fee waivers in that respect.

Finally, communications -- we are -- as I indicated, we are maintaining commonality to a maximum extent with the other announced applicants. We are doing a lot of early interaction with the staff. We started out back in April with a senior management meeting. We had the joint kickoff meeting yesterday, and our proposal is is that the technical issues will be common as we proceed.

And we are keeping stakeholders informed. We've been doing that already with our local stakeholders. And when the staff gets ready to start having their public meetings, we'll certainly want to be participating in those meetings to maximize the amount of information transfer that takes place.

So, in summary, in 10 months since we talked last, a lot has happened. Much has been accomplished, but there's much to do. We're at the threshold of making far-reaching decisions that will go to the energy security of the country for a long, long time.

I think as Jim Lyons indicated, we're at an exciting point where a lot of people are gravitating to this point, but there's a lot of work to be done, but it's important work. It's work that will make a difference for a long time.

We have a real commitment to common industry approach. We're trying to save resources on all sides by making as much common through NEI as possible. But the ultimate goal of all of this is that we need to make sure that as we work through Part 52, elements that have been in place for a long time but never demonstrated, that the results of that are stable, predictable, and timely.

Thank you.

COMMISSIONER DIAZ: Thank you, gentlemen. Obviously, it seems like we could probably use a few more hours in this round.

Commissioner Merrifield has a noon appointment, so he will start.

COMMISSIONER MERRIFIELD: Thank you very much, Mr. Chairman.

I want to -- as promised, I want to go back to Marvin Fertel. If we don't require programmatic ITAACs, what is going to drive -- one of the accusations is that a licensee in a submission for a combined operating license would have sort of a shell. This is what our program in this given area is going to look like, without having the necessary amount of detail in it that we need in order to provide reasonable assurance.

How do we avoid that? How do we make sure that we have the depth of relevant information for us to make a determination on those programs?

MR. FERTEL: At least my expectation is you wouldn't be getting something like that, but your question is a valid one. I think you could avoid it in a couple of ways. One, you could issue the COL with a license condition requiring the additional information prior to fuel load. Two, you could not issue the COL until you got the programmatic information.

Again, from our standpoint, we don't see any licensees looking to skirt through and not provide the information. So, I mean, I -- I think you can come up with hypotheticals -- the staff and others can come up with hypotheticals -- you won't get this, you won't get that.

I think you still have the entire COL process that you have to go through. The reason for doing this is to disposition this at the front end to avoid the uncertainty at the other end. When Gene just said it may be more important to have time scales on some of this that you meet, than short time scales that you don't meet, what we need for business decisions is certainty and predictability.

It's not in my best interest to leave loose ends at the COL if I can avoid it. I would rather give you my programs and get them approved. If I don't give them to you, I think if I were sitting on the staff side, I would say -- put in a license condition that says, "By or prior to X action, you must submit the following information."

You won't be able to verify some of the programs at the time you approve the COL. I mean, you obviously couldn't verify programs that we haven't implemented yet. So operator training, for instance, you would have to, at some point before we actually loaded fuel, go out, and we think you would do the normal inspections you do to see whether or not we've put the training program in place, we've got the procedures, the people are trained, etcetera, and you do that.

But, for instance, the ISI and IST program, you couldn't do that for 10 years or more. So, I mean, you can't verify some of these things until the plant is actually down the road, because of the nature of what the programs are. But we -- to be honest, Commissioner Merrifield, we don't see that issue as one that you couldn't manage at the front end. And to be honest, we don't see anybody not putting in the programs. It's not in their best interest.

COMMISSIONER MERRIFIELD: Well, I recognize that. Obviously, there's a tension there between where you are and where our staff is. And I think the five of us have to figure out the best place to resolve that, and there may be further discussion on a staff-to-staff level that could occur to bridge some of that.

One could assert -- you say, "Well, you know, sort of trust us," you know, at the end we really -- you know, we're going to need to put these things in, so it's in our best interest to do that. To paraphrase a former President, you know, we can trust, but obviously

we need to verify.

MR. FERTEL: Again, I didn't say trust us; I said put a license condition in. And I said don't even issue the COL if you feel strongly enough that you don't trust. If I come in with no programs, don't issue me the COL.

If I come in with all of the programs but one and say, "Hey, I'm still trying to firm this up, and it's going to take me another two years," for whatever reason, which I have a hard time imagining, then issue a license condition that indicates that prior to fuel load that needs to be in place and signed off, and then maybe even have a hearing, because you haven't had a hearing on that particular one.

I mean, we're not honestly trying to get out of any programs. And, again, certainty on our side is more important than making believe that we're going to sneak through something.

(Laughter.)

COMMISSIONER MERRIFIELD: All right. Let me turn to Mr. Riccio. I have a little bit more of a -- it's a little bit of a different question for you. One of the things that you talked about in your presentation is the fact that we -- that in your eyes we've squandered resources, we've spent money reviewing designs that may never come to fruition where we could better use that money on reviewing the operations of the current 103 operating reactors.

What -- and I understand where you're coming from on that. But what statutory authority will we have as an agency to say, "Well, we think that these things are too speculative. Therefore, we're not going to seek the funding necessary to meet licensees or companies in bringing these forward, despite the fact that we impose fees relative to those.

What -- I mean, it's a nice thing for you to say. But what -- you're a lawyer. What statutory authority do you have --

MR. RICCIO: There may not be statutory authority. But the thing is, you're actions are so broadly written, I'm sure you could find some room for it in there.

The industry has been coming forward with these, you know, new designs that basically don't have any operating history, don't have any real -- I mean, even your staff was shocked at the lack of information being put forward by Exelon for the pebble bed. And I will say, too, that I was impressed by, you know, some of the statements that were made by Exelon rose your staff right out of their seats.

COMMISSIONER MERRIFIELD: Well, but --

MR. RICCIO: They're being --

COMMISSIONER MERRIFIELD: But isn't that really the heart of what you're asking? We've got to ask the serious questions about whether those designs have the safety margins that --

MR. RICCIO: And I had recommended in those meetings that the Commission address some of these issues early on, rather than leaving it down to the staff and industry level. You know, if you were to -- if the staff -- or, sorry, if the Commission would have gone and addressed some of the issues raised in Dr. Powers' trip report and many of the other -- you know, even the previous letter from '88 that called some of these new designs a major safety tradeoff, then we may not have wasted the time spent on the pebble bed, or potentially even the GTMHR or the MHTGR, whichever, you know, name General Atomics wants to attribute to it now.

COMMISSIONER MERRIFIELD: Yes. But in --

MR. RICCIO: We might not have wasted that time and could have been spent it, as I said, you know, focusing on the reactors that exist --

COMMISSIONER MERRIFIELD: Well --

MR. RICCIO: -- or even, you know, while I don't want to see any new reactors built, the industry might have been better off had they focused their resources on reactors that have been certified rather than reactors that basically have economic profiles that made them potentially more attractive.

I think the reason some of these designs may have appeared to be potentially more attractive is because they hadn't been certified. They hadn't gone through any process.

COMMISSIONER MERRIFIELD: Well, that's fine, but the -- but it is the process, indeed, of having to go through design certification that winnows out those that aren't -- that in your eyes wouldn't meet those safety criteria.

MR. RICCIO: It may --

COMMISSIONER MERRIFIELD: In the rule -- I mean, what you're -- I mean, it's attention. It's attention that you recognize. But as a Commission, our role is as -- is to settle policy issues, and there are certain technical issues in early technical areas where we can and should lean to our staff to do the early work, to raise those policy issues that would come to us for ultimate resolution, which is what Congress and the American people require of us.

And I understand what you're saying, gee, if we just jumped in early and decided some of those policy issues, we might not have needed to spend some of that money in the pebble bed. But I'm not certain -- again, I've got to have a -- I've got to have a legal basis in order to make those kind of determinations that you're asking us to make. And I'm not -- I don't -- in my read, I don't find those.

MR. RICCIO: Well, I think the Commission has the authority to determine whether or not it's going to allow reactors to be constructed in this country that abandon defense-in-depth and move over to a more -- you know, more of an approach that measures balance between mitigation and prevention. You know, these issues have been floating around there since the '80s.

COMMISSIONER MERRIFIELD: Sure. But as it relates to -- well, there's a difference here, but I think -- I think the tension is as it relates to a given design. I don't think the Commission -- I or the Commission -- without sufficient information from the staff on the technical issues can simply fly out of nowhere and say, "Well, you know, I just don't think that's a good design. I mean, I don't think" --

MR. RICCIO: Well, you know, the ACRS pointed out to the Commission in 1988 that the advanced designs being promoted by the Department of Energy constituted major safety tradeoffs. And I thought that that would have at least triggered, you know, some work on potentially the staff's part to see whether or not these are even viable.

You know, Dr. Powers said it's not certifiable and --

COMMISSIONER MERRIFIELD: Absent having the designs in front of us to actually review, we wouldn't be able to make that determination in the abstract. And while ACRS can make -- and we ask them to sort of think big and come back to us with some recommendations, absent having a specific license application in front of us, again, I don't think we, as a Commission, can act on those recommendations without having specific information from our staff.

But, anyway, I want to go on to -- I've got to go. I want to go to -- actually, I need -- that needs to be my last question.

Thank you, Mr. Chairman.

COMMISSIONER DIAZ: Thank you, Commissioner Merrifield.

Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: I agree with Commissioner Diaz. We could be here a long time if we asked all the questions that we have, so I'll just try to ask a few of them.

Dr. Kress, as I see the various items that you say we need to work on, they almost all relate to gas reactors. I mean, we have a framework in place for lightwater reactors where we don't have to worry about coming up with new CDF and LERFs, and we don't have to come up with new defense-in-depth or new criteria for selecting design basis accident --

DR. KRESS: You might want to think about selecting design basis accidents.

COMMISSIONER McGAFFIGAN: Well, that gets to the double-ended -- that we have a process for looking at double-ended guillotine breaks and all of --

DR. KRESS: I didn't mean that these are outstanding issues that --

COMMISSIONER McGAFFIGAN: Right.

DR. KRESS: -- that I'm throwing in. I think the staff is on top of it.

COMMISSIONER McGAFFIGAN: But if I'm listening to you properly, if I am -- if I am Dominion and I'm trying to figure out which of these reactors is actually likely to be ready in a finite period of time, I've heard their staff say that there's a five-year lead time for some research that needs to be done. I've heard you saying we need to -- and the staff, we need to do a lot of inventing of things or follow an exemption process.

And if you're in an exemption process and that's -- that's all of those exemptions -- and Steve can correct me if I'm wrong -- but if they're an integral part of the application they are subject to hearings and all of that. So it's quite inefficient, if you don't have the framework in place. So I think it points to, at least in terms of regulatory risk, that there's less risk with lightwater reactor designs than there is with the gas reactor designs. It's just a fact.

DR. KRESS: I think you're absolutely right.

COMMISSIONER McGAFFIGAN: Okay. I'll pick up, Mr. Riccio, in a different concept, different part of your talk. You complain about public participation, that the process that we have in place in Part 52 is something that the Congress -- my recollection, it was the Energy Policy Act of 1992 endorsed, and my recollection is my party, the Democratic party, was in charge of both houses in 1992.

(Laughter.)

MR. RICCIO: I recollect that.

COMMISSIONER McGAFFIGAN: And so it's a -- it was the consensus view of the Congress that the degree of public participation that is allowed in the Part 52 process is the proper degree, and there's quite a robust degree of public participation.

You're going to be involved -- if I take -- if I'm Dominion and I'm trying to figure out whether -- how much I should worry about you moving within 50 miles of North Anna, you will -- even if you're not, you're going to get -- you have a chance for hearing on the early site permit. You have a chance for hearing on the combined operating license. I mean, a mandatory hearing on the early site permit.

You have scoping meetings for the EIS. You have comments on the draft EIS. You have -- totally apart from whether you adjudicate these things. There strikes me that there's an enormous amount of public participation in the process as mandated by the Congress in the Energy Policy Act of 1992.

MR. RICCIO: I --

COMMISSIONER McGAFFIGAN: One little --

MR. RICCIO: -- since the hearings in '92, and, in fact, I worked to sue this agency over the original license -- or the original promulgation of Part 52, because it removed the public's right to a hearing post-licensing.

The industry had used that as a trojan horse to claim that it was those hearings that had caused the construction delays that basically crippled this industry back in the '70s. And I guess it's only in that perspective that I see a diminishment of the public's right to participate.

Also, the use of generic -- use of generic issues to take issues off the table has also been a problem. I like the fact that --

COMMISSIONER McGAFFIGAN: Whenever we do that, we do it by rulemaking, and you have a chance to comment on the rule.

MR. RICCIO: I understand. It's --

COMMISSIONER McGAFFIGAN: And you have a chance to sue us after the rule is finalized. Okay. Well, okay. Just for the record, you -- I enjoyed reading Mr. Bradford's and Mr. Gilinsky's, et al., comments. But I don't think that was where the body politic as a whole was in the late 1980s, and we'll just leave it at that.

I'm trying to -- the 2010 initiative, if I'm Dominion, and if I have a dream of having a plant in 2010, which you may or may not have, you're going to go through -- you're going to apply for an ESP, according to the staff, in September 2003. Under your schedule, you would get a result -- nay or pro -- in September 2005.

If you're ready for a combined operating license application at that point, which you may or may not be, but if you were to follow up now with a certified design and an early site permit, and let's hypothesize that that -- that's going to take two years. Now I'm to September 2007.

MR. RICCIO: Right.

COMMISSIONER McGAFFIGAN: And you have the license at that point, assuming a positive decision to go build in September 2007. Can you have a plant in 2010? I mean, are any of these vendors telling you they can get it built in three years from the date that you get the application approved?

MR. GRECHECK: Not yet, no.

COMMISSIONER McGAFFIGAN: Is that an important part of being able to -- I mean, how quickly do you think you have to be able to build the thing in order to be financially viable?

MR. GRECHECK: Well, first, 2010 is the administration's objective. It's not Dominion's objective.

COMMISSIONER McGAFFIGAN: No, I understand. But I'm trying to help Mr. Card thing about this stuff, too. Whatever.

MR. GRECHECK: I would say we are hearing from various vendors that four-year construction periods look reasonable. And, again, as I said before, it's not so much the time as it is the predictability. If somebody can come to me and say, "We could build you a plant in 48 months from the date of start," with a reasonable amount of assurance that that indeed will happen, then we can build a financial case around that.

The concern would be for somebody to say, "We can do it in 48 months," and then, for whatever reason, whether it's construction issues, whether it's licensing issues, whether it's financing, whatever it is, it actually turns in to be 10 years. Now that is a very, very serious financial problem, and that's something that we will be doing everything we can to control before we would commit ourselves to a project of this magnitude.

But, you know, I'm hearing a lot of good talk. We've engaged with a number of suppliers and AEs, and they are telling us, you know, 48 months look reasonable, and we are working with them very closely to see if we can come to a level of assurance that we believe that.

COMMISSIONER McGAFFIGAN: I might just take another minute, I guess going back to Mr. Riccio as well. ITAAC I'm going to leave. I mean, we've got a paper in front of us, and we'll figure it out. But the issue that Commissioner Merrifield was talking about -- I do think these things have to ripen.

There were several of us who were skeptical about the hype with regard to the modular -- the pebble bed modular reactor. I think the industry probably, if I was going to lay out money, I would have been skeptical, too.

And then, the process, you know, followed and they discovered, after a hard look, according to their -- Mr. Rowe's statements to financial analysts that there were significant financial, technical, and organizational issues that they needed to overcome, and it was no longer appropriate for Exelon to be in that business in his opinion.

And so that -- but the technical issues -- and to the degree the financial issues are connected to the technical issues -- were fairly evident throughout the process, and the staff did a good job of uncovering them. So I think that the proper role for us is to wait until these issues ripen. Sometimes they don't ripen because the plug gets pulled by the vendor itself as it becomes more obvious that there are issues.

So I think we -- you know, the 1988 memo, which I am not familiar with, from ACRS, may or may not reflect current ACRS thinking. But, more importantly, it -- I think Commissioner Merrifield was right. It didn't reflect the process as we've undertaken it the last couple of years. I mean, somebody comes in with an application.

You know, in contrast with the PBMR, I think the AP1000 process is likely to be very, very straightforward. I mean, that's my personal opinion. You have a right in the AP1000 process as a member of the public to be involved. No member of the public has thus far chosen to get involved in any of the design certifications.

MR. RICCIO: I think that was the point of the rewrite of Part 50 into Part 52 was to basically divorce the siting and the reactor design from the public's purview.

COMMISSIONER McGAFFIGAN: But you have the opportunity. You just haven't afforded yourself the --

MR. RICCIO: That's not the point, though, Commissioner. The reality is, if the public isn't aware that a reactor is going to be constructed on a site that's going to threaten them, why, in God's name, should they get involved in the process? By removing even the type of reactor design that is going to -- you know, to be placed on that site, you even further divorce them from reality.

You know, it was interesting to see that when the staff misspoke and said that the industry was applying for siting for new reactors, the industry came up out of its chair, "We're not applying for new reactors. We're merely getting an early site permit process." I think that demonstrates their attempt to really divorce the siting from the reactor.

And, honestly, I think if you go ahead with some of these more advanced designs, you're going to have problems, and, in reality, it's the agency that's going to get blamed for the problem. I can see an instance where you'll go down the path, new issues will be -- will arise about these conceptually new designs, and then you'll be placed in a position that has already been outlined where you have to make a go-ahead decision that you may not have the information --

COMMISSIONER McGAFFIGAN: But I just -- I'll end this, Mr. Chairman, with just -- just this last -- I think you're reflecting more the politics of environmental community funding than you are -- the opportunities are there. You can be involved in an early site permit. You can be involved in a design certification.

What you're saying is that unless you have an energized public at a particular site, it's hard to get the funding that you would need to get involved in the design certification.

MR. RICCIO: It's not a question of funding. It's a question of whether you have -- you know, like you guys are concerned about your full-time equivalents, you know, your FTEs. You know, you think you're stressed?

You know, the amount of people that are paying attention to this in the public are few and far between. And those resources, quite honestly, should be better focused upon the reactors that exist and that are threatening our livelihoods.

COMMISSIONER McGAFFIGAN: Well, we believe, and I think that -- I can't take any credit for it, but the Commission of the late '80s and the Congress of the late '80s and early '90s, I think put together a process that makes sense, that it's efficient and effective, and that adequately protects public rights, if the public chooses to exercise those rights. And I'm going to leave it at that.

COMMISSIONER DIAZ: Thank you, Commissioner McGaffigan.

Obviously, you know, we could spend a lot of time talking about the healthy effects of market forces, which I happen to believe in, being that I am in the other party.

(Laughter.)

But --

COMMISSIONER McGAFFIGAN: Democrats believe in market forces, too.

COMMISSIONER DIAZ: Yes. Yes, yes, yes. Not to the extent that we do, but that's --

(Laughter.)

No, I'm kidding. I'm kidding.

Obviously, selection or non-selection is a very important process for the industry and for us, and I believe that when things get started you have a tremendous amount of information. I believe we are convergent in what is important and what needs to be looked at, and I think our processes that are in place will allow us to do a very good job of selecting where we put our resources.

It won't be perfect, but I think it will go forward, and so I think we'll be going in that direction.

Dr. Kress, a quick thing in here -- I'm getting a little technical in here, but I can't resist. You put the statement in here, CDF and LERF are insufficient acceptance criteria. Of course, that is taken by itself. It's kind of, you know, a very incomplete statement once you complete it with the additional, you know, components of trying to get frequency in between.

However, once you get into summation, I get concerned. You can't add all of these frequencies together without a weighting factor, and what is going to be your weighting factor once you start summing them?

DR. KRESS: Well --

COMMISSIONER DIAZ: Because, you know, I mean, the frequencies by themselves, of course, is not the issue.

DR. KRESS: Well, one weighting factor -- one thinks of that is the standard risk aversion type thing. Once you get down to the high consequences, you want to weigh the frequencies a little more. I have a good concept for how you would weight the various frequencies. Of course, you're not as concerned about the very frequent ones that don't result in much consequences as much as you would for the low frequencies.

You wouldn't, I think, want to think about a risk aversion concept. I don't have a suggestion on what that --

COMMISSIONER DIAZ: But you do believe that before we start summing, you know, frequencies, the high, low, that they have to be weighted?

DR. KRESS: Yes. Yes, I certainly would think --

COMMISSIONER DIAZ: All right. Okay.

DR. KRESS: -- a weighting would be appropriate.

COMMISSIONER DIAZ: Okay. All right. Thank you. That's an important thing.

Mr. Fertel, I wish we had a couple of hours to get into some of my favorite subjects -- ITAAC. But just to touch on it, if -- you know, I used to think of quality assurance as a very encompassing thing, you know. That it's something that probably applies more than to structures, systems, and components, and, you know, the quality of the programs and itself -- the program itself has all of those things.

If you have a quality assurance program that is broad in concept, couldn't it be applied to the quality of the programs that you're going to have in place from the very beginning?

MR. FERTEL: Sure. I would think, in essence, but I'm not sure whether it's an Appendix B requirement as much as a culture of quality at the sites.

COMMISSIONER DIAZ: And shouldn't that, you know, tied in with the fact that we have additional, you know, inspections and, you know, enforcement if you want to, shouldn't the combination of that be an acceptable process to get -- not to have to do programmatic ITAACs on every concern?

MR. FERTEL: I think so. I think that's exactly how you're looking at the 103 operating plants --

COMMISSIONER DIAZ: All right.

MR. FERTEL: -- in that philosophy, Commissioner, and I think that's the same way you've licensed the 103 at the operating license stage.

COMMISSIONER DIAZ: Okay.

MR. FERTEL: So I would say yes.

COMMISSIONER DIAZ: Okay. All right.

And, Mr. Riccio, I wish I had some viewgraphs that I have about cost overruns, and so forth. By the way, I'm firmly convinced that, yes, everything had an impact on the cost overrun. But primarily, if you look at the data, it was the fact that there was double digit inflation and double, you know, digit, you know, interest rates.

That had a tremendous to do -- because it is actually -- it's called a time feedback loop. What it did it delayed the construction, which you pay more for it, which actually then people have more time to look at it, so more issues came out.

The NRC was not precisely the most effective and efficient mode of operation. I mean, everything contributed, but the main contributing factor is actually the fact that we had a tremendous period with very high interest rates, and that created the cost -- it complicated things.

You know, public participation was there -- a factor, but I think it was a valuable exercise. I think what the Commission is trying to do -- and I'd like your comments on it -- is really avoid abuses by anyone, by anyone, not -- you know, the industry, us ourselves are accountable, and the public, trying to make it into a very, very accountable process, not only equitable and fair but an accountable process. Would you like to comment on that?

MR. RICCIO: Just that in the first go-round, I don't believe anyone was abusing the process. In fact, industry has used the example of Seabrook and Shoreham as the -- you know, as the shining lights about public participation tied up the process.

In fact, the public attempted to raise the emergency planning issues that held up those licenses early on in the process and were shut down by the NRC. I think addressing some of these things in the early site permit process can be valuable. We can address some of them early on.

I was just -- I didn't like seeing my rights to hearings being stripped from me.

COMMISSIONER DIAZ: They have not -- they have not been.

MR. RICCIO: They were. They were. And, in fact, that's why we sued you. And, I mean, in fact, we were so right that Clarence Thomas even agreed with us. Unfortunately, that's when, then, the House and the Senate got involved and rewrote the --

COMMISSIONER McGAFFIGAN: All those evil Democrats.

(Laughter.)

COMMISSIONER DIAZ: All right. Okay. Thank you.

Mr. Grecheck, just to underscore, you know, something that everybody has been saying, I'd like your comments again on it. This is a two-way street. For us to be efficient, we need to have the information very early and the staff make that comment.

And, you know, the earlier that we know which way you're going, the more focused we can get in our programs. And there is no doubt about it, you know, we are -- we have restrictions on manpower and resources, and sometimes it takes quite a bit of work to get our budget changed. And it's not as easy as it sounds.

And, of course, if we change the budget, then our friends in the industry tend to complain about it. And so it -- the efficiencies are going to be resolved by focusing the resources on what is really most important, and I think we can do that.

But is the industry getting closer now that there seems to be, you know -- natural selection has taken place. And the staff probably already alluded to it when I asked the question on lead time. You know, it was very clear, you got lead times of two or three years. That tells you what can be billed.

You've got lead time of five years, and we know that when research is involved these lead times could, you know, not -- not talking about our research --

(Laughter.)

-- researchers in general. You know, having been there, you know, it could be five, could be six, could be seven. And, therefore, do you think that natural selections has already taken place?

MR. GRECHECK: Yes, I think there is natural selection occurring. You know, what we've seen happen over the last several months with people deciding that they're going to continue or not continue is certainly a part of that.

On the other hand, I think one of the things that happens with natural selection is that you get diversity. And when you see opportunities there, then I think we're also seeing some additional diversity. We're actually seeing some new entrants into the pool now that perhaps a year ago we didn't expect.

But, obviously, when we talk to those folks, we say, "Well, okay, now you tell me how you're going to make the licensing process work, if you're getting into this process at this point," and that's something that they need to discuss.

I think selection, for it to work, needs to be based on facts rather than speculation. So as more facts are developed, then that makes the selection process move along. And as that moves along, then that makes it easier to make decisions.

I think all I can say at this point is that I think we are certainly much more knowledgeable about what our criteria for a successful project would be today than we were a year ago. I think that ESP and just getting the staff engaged on real licensing activities is important, because once we start establishing the framework of how we're going to do these things, then it will establish additional assurance on both the staff's part and industry's part as to, you know, what is this going to look like? What are the resources available? What are the problems?

So it's happening, but it's probably not happening fast enough for any of us. But, you know, we'll continue to work with the Commission to help it move along.

COMMISSIONER DIAZ: Well, I want to assure you I'm not claiming to speak for my fellow Commissioners, but we are very -- all concerned with the fact that we need to be responsive to whatever needs the country has and whatever they arrive -- and that this is an issue that will continue to consume us.

I'm just about finished, unless Commissioner McGaffigan has --

COMMISSIONER McGAFFIGAN: There's just one last question I had. Do we need a standard review plan for the early site permits and for the call when we get to it? I mean, you all are saying there's guidance all over the place, and that some of it's out of date, some of it refers to codes that are no longer up to date or are totally outdated. Do we need to have, by the time you all are applying a year from now, at least the beginnings of a draft standard review plan for ESPs?

MR. GRECHECK: I would say that if we had an SRP a year from now, then we would have lost the opportunity to work with the staff for this whole process. You know, the application -- the submittal of the application ought to be the end of a data-gathering and data accumulations point, which we need to work with the staff to get to that point.

I'm not sure that getting an -- and, again, this is just my perspective. I'm not sure that issuing an SRP before anyone has ever seen an application --

COMMISSIONER McGAFFIGAN: So you want to wait until after the --

MR. GRECHECK: I think that part of the process will be to develop it.

COMMISSIONER McGAFFIGAN: So at the end of the initial tripartheid application, that's the way you want us to think about it --

MR. GRECHECK: I think it would be a good opportunity.

COMMISSIONER McGAFFIGAN: But at the end of the tripartheid application process, an SRP will naturally emerge.

MR. GRECHECK: I think so.

MR. FERTEL: I think I would feel exactly the same way. I think that the learning experience in going through that will allow a much better document to come out, rather than everybody freezing in space trying to do it in the abstract absent the interactions and the applications.

COMMISSIONER McGAFFIGAN: And I'll note that that, of course, bolsters your case for fees being reduced because there will be a generic --

MR. RICCIO: And not to be contrary --

(Laughter.)

-- but it would seem that at least an SRP would at least clear up some of the questions that already exist about the quality and pedigree of some of the data.

What I was picking up from some of your meetings, there -- the industry has collected a lot of data that didn't meet the requirements of Appendix B. And there is a question about whether -- how that's going to be used in this process, and perhaps we can clear that up before these gentlemen come forward with their tripartheid plan.

MR. FERTEL: We agree with Jim on clearing it up before they file, and that's actually what's going on now in meetings that Jim is certainly welcome to attend, because they're all public meetings. But we'd still say that the SRP is probably better put together as there's hands-on experience by the staff in going through this process.

COMMISSIONER DIAZ: Thank you.

I think before I close, I think I -- I really have to put for the record a comment on something that Mr. Riccio said regarding nuclear powerplants being terrorist targets. I want to reassure you and the public that there has been no credible threats against any nuclear powerplants in this country. Okay?

I would love to have you come over to my office and talk about it.

MR. RICCIO: I'd probably have to get a security clearance.

COMMISSIONER DIAZ: You might not. You might not. You might not.

Again, I want to thank the staff for a very informative meeting. I think that there is a lot of information that has been assembled. Most of it is going to be used shortly against us, I think. And we'll be ready for it.

I want to thank our participants for coming; we appreciate it.

Have a very good day. And without anything else, we are adjourned.

(Whereupon, at 12:20 p.m., the proceedings in the foregoing matter were adjourned.)

Commissioner Dicus' Questions and Additional Comment for NRC Staff - Commission Briefing on the Status of New Reactor Licensing Activities, 5/29/02

RE: Early Site Permits (ESP) - Three utilities (Dominion, Entergy and Exelon) have announced that they intend to submit an application for ESP in June 2003.

• With the first application only a year away, what does the staff need to accomplish in order to be ready to review an ESP application?

• Mr. Lyons mentioned that the staff is working on a planning matrix to coordinate the multiple activities that are on-going on new reactor licensing. What is the status of the planning matrix and what kind of information will it contain?

• The staff and industry has compared the ESP application review to the license renewal review. Are these reviews similar such that the same staff that is performing a license renewal review can also perform an ESP review? How are the environmental reviews for license renewal and ESP different, if at all?

• In SECY-02-0076, it is stated that due to uncertainty of the new reactor activities, the staff will increase its reliance on contractor support. If three ESP submittals are received around the same time, how much reliance on contractor support is anticipated to complete the ESP reviews? Is this contractor support currently in the budget for FY03, 04 and 05? Additionally, Mr. Grecheck of

Dominion Power stated that the three ESP applications will look the same, i.e., contain identical information, except for site specific information. What steps has the staff taken to ensure similar submittals which contain adequate information are received?

• DOE has received proposal from the three utilities for co-funding the ESP applications. Has the staff received any indication from the three utilities that they would continue to pursue the ESP application even if they do not receive funding from DOE?

Additional Comment:

In SECY-01-188 and SECY-02-0076, the staff has proposed to begin rulemaking in FY 2003 on 10 CFR Part 50 Appendix I. This proposed rulemaking would incorporate ICRP 26 methodology and address non-LWR designs. Before any rulemaking effort begins, the staff should be mindful of the recent Commission decision on SECY-01-0148, "Processes For Revision of 10 CFR Part 20 Regarding Adoption of ICRP Recommendations on Occupational Dose Limits and Dosimetric Models and Parameters," SRM dated April 12, 2002, and continue to coordinate any proposed future rule changes for Appendix I with RES and NMSS.

It is my opinion that, due to the ongoing international and scientific efforts, and the fact that any proposed change to the current Part 20 regulations would likely: (1) provide little to no added safety benefit to the general public (i.e., the doses received would most likely not be lower with any change in regulation); (2) be immediately outdated with newer ICRP revisions which are planned to be presented in the near term (i.e., 5-years); and (3) be extremely costly and time-consuming for both Federal and State agencies, as well as licensees, the Commission was wise to decide to wait on making any future rulemaking changes to 10 CFR Part 20. With the plethora of new scientific information available to all of us in the near term, the staff should consider not proceeding with proposed rulemaking on 10 CFR Part 50 Appendix I in FY 2003, but rather, consider and grant licensee requests to use the methodology of ICRP 26 on a case-by-case basis as applicable in Part 50 Appendix I, until the Commission approves an overall rulemaking plan to revise 10 CFR Part 20.

Staff Responses to June 3, 2002, Questions by Commissioner Dicus
Related to the New Reactor Licensing Briefing, May 29, 2002

Question "With the first application only a year away, what does the staff need to accomplish in order to be ready to review an ESP application?"

Answer For the early site permit (ESP) pre-application activities between now and June 2003, the staff will identify reviewers, establish contracts, schedule meetings with applicants, and interact with the public and other interested stakeholders. These activities require good information from the industry so that the staff can effectively plan and schedule our workload. It is our expectation that this information will be forthcoming over the next few months. In order to prepare for the application activities themselves, the staff will:

- Develop an ESP Review Standard to provide (1) a clear definition of review scope in order to assist work planning efforts to enhance the quality and timeliness of the ESP review; and (2) a reference of the existing review criteria (i.e., applicable Standard Review Plan sections, Branch Technical Positions, NUREGs, etc.). The staff expects to make the Review Standard publicly available by the end of this year.

- Establish the inspection procedures necessary to support the ESP review.
- Work with the Nuclear Energy Institute (NEI) and the ESP applicants to resolve any generic issues which might impede the timely review and disposition of an ESP application.

Question "Mr. Lyons mentioned that the staff is working on a planning matrix to coordinate multiple activities that are on-going on new reactor licensing. What is the status of the planning matrix and what kind of information will it contain?"

Answer The planning tool will consist of the following:

1. Plant specific review schedule of tasks and milestones.

2. Critical skills and resource estimates assigned to each task.

3. Individual review schedules will be aggregated together across the three ESP reviews and other critical work (e.g., license renewal).

With this tool, the staff will be able to effectively plan its review schedules and identify critical path activities. The tool will assist the staff in leveling its work load and achieving milestones.

The staff is currently confirming the process steps of the ESP review and assigning critical skills and resources to each step. Following completion of this activity, the staff will develop a model of this process to integrate the plant specific reviews of the three applications and other critical work, including license

renewal. The target for completion of the integrated schedule is the end of the fiscal year.

Question "The staff and industry has compared the ESP application review to the license renewal review. Are these reviews similar such that the same staff that is performing a license renewal review can also perform an ESP review?"

Answer As discussed by Mr. Lyons, we fully expect that the set of skills utilized for license renewal review can be used in the environmental review for an ESP application. In addition, an ESP review includes a site safety review, which requires critical skills that have not been utilized for some time to assess site characteristics (e.g., meteorology, hydrology, seismology). The ESP review also assesses emergency planning capabilities.

Question "How are the environmental reviews for license renewal and ESP different, if at all?"

Answer Environmental reviews of ESP applications will consider the impact of construction and operation of a new facility at a site. License renewal reviews consider only the impact of continued operation. In addition, generic environmental issues for license renewal have already been dispositioned. Therefore, the scope of the ESP environmental review is greater than that for license renewal.

Question "IN SECY-02-0076, it is stated that due to uncertainty of the new reactor activities, the staff will increase its reliance on contractor support. If three ESP submittals are received around the same time, how much reliance on contractor support is anticipated to complete the ESP reviews?"

Answer SECY-01-188 estimated that about $1.7 million dollars of contract support is needed to complete each ESP review for an existing site. This support would be expended over the course of the entire review. Initial planning for the three anticipated reviews has not changed the mix of staff and contract resources for these activities.

Question "Is this contractor support currently in the budget for FY 03, 04, and 05?"

Answer Yes, the staff's proposed FY 2003-2005 budget includes contractor support for ESP reviews.

Question "Additionally, Mr. Grecheck of Dominion Power stated that the three ESP applications will look the same, i.e., contain identical information, except for site specific information. What steps has the staff taken to ensure similar submittals which contain adequate information are received?"

Answer The staff is working with NEI and the ESP applicants to resolve generic issues which might impede the timely review and disposition of an ESP application. Meetings with stakeholders on this issue have already taken place, which will help applicants develop their submittals. In addition, the ESP Review Standard will aid applicants, informing them of the nature and scope of staff review.

Question "DOE has received proposal from the three utilities for co-funding the ESP applications. Has the staff received any indication from the three utilities that they would continue to pursue the ESP application even if they do not receive funding from DOE?"

Answer Verbal discussions with DOE representatives indicate that the three utilities fully intend to pursue their ESP applications even if they do not receive funding from DOE. There has been no indication from the three utilities that their ESP application schedules are dependent in any way upon receipt of funding from DOE.