

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**

**Title:                BRIEFING ON ALTERNATIVES FOR**  
**REGULATING FUEL CYCLE FACILITIES -**  
**PUBLIC MEETING**

**Location:            Rockville, Maryland**

**Date:                Tuesday, July 2, 1996**

**Pages:              1 - 75**

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1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING ON ALTERNATIVES FOR REGULATING  
5 FUEL CYCLE FACILITIES

6 \*\*\*

7 PUBLIC MEETING

8  
9 Nuclear Regulatory Commission  
10 One White Flint North  
11 Rockville, Maryland  
12

13 Tuesday, July 2, 1996  
14

15 The Commission met in open session, pursuant to  
16 notice, at 10:00 a.m., Shirley A. Jackson, Chairman,  
17 presiding.  
18

19 COMMISSIONERS PRESENT:

20 SHIRLEY A. JACKSON, Chairman of the Commission  
21 KENNETH C. ROGERS, Member of the Commission  
22 GRETA J. DICUS, Member of the Commission  
23  
24  
25

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 JOHN C. HOYLE, Secretary of the Commision

3 KAREN D. CYR, General Counsel

4 JAMES TAYLOR, Executive Director for Operations

5 CARL PAPERIELLO, Ph.D., Director, Office of

6 Nuclear Material Safety and Safeguards

7 ELIZABETH TENNEYCK, Director, Fuel Cycle Safety and

8 Safeguards Division, NMSS, U.S. Nuclear

9 Regulatory Commission

10 ROBERT WILLIS BISHOP, President, General Counsel,

11 Nuclear Energy Institute

12 JAMES A. FICI, Plant Manager, Westinghouse

13 Electric Corporation, Columbia, South Carolina

14 CHARLES VAUGHAN, Manager, Regulatory Compliance,

15 General Electric

16 ROBERT WOOKEY, Manager, Nuclear Regulatory

17 Affairs, Assurance and Policy, U.S. Enrichment

18 Corporation

19 HAROLD BURTON, Sr. Vice President, SCIENTECH, Inc.

20 DONALD VIETH, Sr. Technical Advisor, Tank Waste

21 Remediation System, Department of Energy,

22 Richland Operations

23

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

[10:00 a.m.]

CHAIRMAN JACKSON: Good morning, ladies and gentlemen. Today, the Commission will be briefed by both the NRC Staff and industry and other government representatives on alternative approaches on regulating fuel cycle facilities.

The Commission would like to welcome the industry and other government representatives to the NRC. I use "other" because the NRC Staff is obviously government.

We look forward to hearing from all of you this morning. This is an important matter on the Commission's agenda. The NRC has been examining various methods for improving the regulatory program for fuel cycle facilities for the past five years. During that time, the NRC has focused on a number of different aspects of the program, including quality assurance, maintenance management controls and criticalities safety to name a few.

This effort by the NRC Staff has not been done in isolation from the various affected parties. The NRC has conducted workshops with major fuel cycle licensees and other affected stakeholders on this issue and has solicited the views of industry on preliminary draft rulemaking packages.

In April, the NRC Staff submitted a paper to the

1 Commission that identified six alternatives that were  
2 developed to provide a range of options for upgrading and  
3 more clearly defining NRC's regulatory base for fuel cycle  
4 facilities and as part of its deliberations, the Commission  
5 looks forward to hearing more about each of these  
6 alternatives from the NRC Staff and later this morning  
7 hearing the views of industry and other affected parties on  
8 potential modifications to NRC's regulations governing fuel  
9 cycle facilities.

10 Commissioner Rogers, Commissioner Dicus, do you  
11 have anything that you would like to add at this time?

12 COMMISSIONER ROGERS: No, thank you.

13 CHAIRMAN JACKSON: If not, Mr. Taylor, please  
14 proceed.

15 MR. TAYLOR: Good morning. With me at the table  
16 are Carl Paperiello and Liz Teneyck from the Office of  
17 Nuclear Material Safety and Safeguards.

18 The presentation this morning will be given by  
19 Liz.

20 MS. TENEYCK: Thank you.

21 Well, good morning.

22 As you mentioned, today we will be discussing the  
23 topic of upgrading 10 CFR Part 7(d) which contains the  
24 regulations for the possession and use of special nuclear  
25 material. We plan to provide a background of what raised

1 concerns regarding the adequacy of our regulations and  
2 specific weaknesses that have been identified with the rule,  
3 as well as what activities we have had under way since 1993  
4 to upgrade the rule through the rulemaking process.

5 As you mentioned, we have identified a number of  
6 alternatives of proposed ways for the Commission to proceed  
7 and we will discuss those in greater detail today.

8 Next slide, please.

9 [Slide.]

10 MS. TENNEYCK: To review or to familiarize you with  
11 how we got to where we are today, we plan to look briefly at  
12 some events that have happened at our fuel facilities, the  
13 results of some self-assessments that we have made of our  
14 regulatory program and the evolution of actions that the  
15 Staff has taken to date in that vein.

16 Next slide, please.

17 [Slide.]

18 MS. TENNEYCK: Looking back, the most significant  
19 event that has happened at a materials facility occurred at  
20 our Sequoyah Fuels facility in 1986 when an individual was  
21 killed by a hazardous chemical that resulted from the  
22 rupture of a UF-6 cylinder. Now, although Sequoyah Fuels is  
23 a Part 40 licensee, the event did involve the heating of a  
24 UF-6 cylinder which is similar to activities conducted at  
25 many of our fuel facilities today.

1           A resulting congressional committee report  
2 criticized the NRC at that time for being too narrowly  
3 focused on radiological safety and not addressing other  
4 hazards such as chemicals.

5           In 1991, there was an event at GE Wilmington that  
6 focused our attention in the criticality safety area.  
7 Subsequent reviews identified weaknesses at the operations  
8 at the facility as well as weaknesses in NRC's regulatory  
9 program.

10           Next slide, please.

11           [Slide.]

12           MS. TENNEYCK: After the GE event, a task force was  
13 created to review the materials program and it identified a  
14 number of weaknesses. Recommendations to correct these  
15 weaknesses were published in NUREG-1324 entitled Proposed  
16 Method for Regulating Major Material Licensees in February  
17 of 1992.

18           Next slide, please.

19           [Slide.]

20           CHAIRMAN JACKSON: For the record, do you want to  
21 mention what one or two of those weaknesses that were  
22 identified are?

23           MS. TENNEYCK: Okay. If -- let's see. We have a  
24 background slide of -- Slide Number 4, we can move to that  
25 quickly, if you would like, and just quickly go down some of



1     them.

2                     [Slide.]

3                     MS. TENEYCK: They dealt with a requirement to  
4 immediately decontaminate contaminated areas, to require the  
5 reporting of potential criticalities or the loss of  
6 criticality safety controls, to require a standard format  
7 for the licensing application and to in effect move toward a  
8 living license and also to perform a hazards analysis, which  
9 was something that was missing in our regulatory program, to  
10 develop a standardized approach for the submittal of license  
11 applications and the review process and to prohibit  
12 contamination in areas external with facilities. So it  
13 dealt with a lot of risk type of activities from a hazards  
14 analysis to focusing on contamination control to focusing  
15 also on the licensing process.

16                    COMMISSIONER ROGERS: I wonder if sometime during  
17 your presentation you could indicate how serious the most  
18 serious kind of an accident at one of these facilities might  
19 be in terms of public health and safety consequences and  
20 where that might fall in the general spectrum of industrial  
21 facility accidents, in facilities of this general type or  
22 chemical processing type?

23                    In other words, I wonder if you would give us some  
24 perspective of just what is a really serious event that  
25 might take place at one of these materials processing

1 facilities and where would we put that in the spectrum of  
2 consequences which we really want to avoid, just what the  
3 general range is.

4 CHAIRMAN JACKSON: And as a follow-on to that, I  
5 am interested in how the posited ISAs, the safety  
6 assessments, would fall in terms of an ability to answer  
7 questions about the potential for this most serious kind of  
8 event to occur in one of these facilities.

9 [Slide.]

10 MS. TENNEYCK: All right.

11 Continuing with slide five, the Staff addressed  
12 one of the task force recommendations in 1991 when it  
13 published Bulletin 91-01, to encourage licensees to  
14 voluntarily notify the NRC when they lost controls such as  
15 moderation or geometry that were in place to prevent  
16 criticalities. Staff feels that our current regulations are  
17 deficient in that it only requires actual criticalities  
18 events to be reported to the NRC.

19 Staff also considers these 91-01 reports to be  
20 important precursor information which we track and analyze.  
21 We think it is important to know why and when these controls  
22 are lost and also to be in a position to review the  
23 licensees' root cause analysis and corrective actions to  
24 identify any generic weaknesses with our regulatory program.

25 To date, 70 such events have occurred and many of

1       them substantiate the weaknesses that were identified in  
2       NUREG-1324.

3               Next slide, please.

4               [Slide.]

5               MS. TENEYCK: In 1992, Staff initially developed  
6       an action plan to respond to the program weaknesses,  
7       primarily focusing on upgrading guidance rather than  
8       modifying the actual rule and by conducting team assessments  
9       to identify facility weaknesses. And the goal at that time,  
10      I think, was to actually try to inspect safety into the  
11      facilities.

12              The Commission responded at that time with a  
13      direction to the Staff that the highest priority should be  
14      to sharpen and upgrade the regulatory base for determining  
15      the adequacy of licensee performance. So, consequently,  
16      Staff reorganized and developed a new action plan which  
17      focused on, among other things, upgrading the regulatory  
18      base, developing a new standard review plan for the first  
19      time, revising the existing standard format and content  
20      guide and developing implementing guidance.

21              Next viewgraph, please.

22              [Slide.]

23              MS. TENEYCK: We do not feel that fuel cycle  
24      facilities are being operated in an unsafe manner. We do  
25      think, however, we feel that we need to have increased

1 confidence in the operating margin of safety and a better  
2 understanding of the safety basis for conducting activities  
3 at the facilities involving special nuclear material.

4 The present rule is not risk-informed and it does  
5 not require a hazards analysis. Staff's position is that an  
6 integrated safety analysis is needed which systematically  
7 analyzes the potential risk from criticality, chemical  
8 process safety and fire hazards so that potential accidents  
9 or high risks can be identified so that items relied on for  
10 safety can be implemented and measures to ensure the  
11 continued availability and reliability of these measures are  
12 in place.

13 Next slide, please.

14 [Slide.]

15 MS. TENNEYCK: We feel that the greatest threats to  
16 these facilities are from criticality and the hazards of  
17 chemicals and fire. However, our current rule is  
18 essentially silent on the latter two and requires  
19 criticality alarms to be in place but doesn't currently  
20 require licensees to prevent criticalities.

21 Presently, as I mentioned earlier, only  
22 criticality events are required to be reported to NRC. The  
23 Staff feels that reporting requirements similar to those  
24 contained in Bulletin 91-01 should be incorporated into the  
25 regulatory base.

1           Part 70 has also been modified so many times since  
2     its initial issuance in the 1960s that we feel that it is  
3     difficult to understand and administer. It often contains  
4     redundant requirements presented in a very disjointed  
5     fashion. It also is very prescriptive in some areas and, in  
6     other important safety areas, essentially says operate  
7     safely.

8           The requirements also address a wide range of SNM  
9     uses, from subcritical quantities of material that are  
10    contained in sealed sources all the way to large quantities  
11    of highly enriched uranium. So the rules are required to be  
12    applied to a large group of cats and dogs, as you might say.

13           Next slide, please.

14           [Slide.]

15           MS. TENNEYCK: Staff had concurrently developed a  
16    rulemaking package that contained a rewrite of Part 70, a  
17    totally new standard review plan, a revised standard format  
18    and content guide, a guidance document on implementing an  
19    integrated safety analysis and a regulatory analysis that it  
20    had proposed to provide to the Commission in June of 1995.  
21    However, at a Commission meeting in March of 1995, the  
22    Commission directed the Staff to provide the draft  
23    rulemaking package to industry and other interested parties  
24    to solicit their input on the proposed changes, without the  
25    customary statement of considerations that would normally

1 have gone along explaining the purpose of the rule and  
2 without a planned two-month refinement period in which the  
3 Staff had proposed to finalize the rule before it was  
4 submitted to the Commission.

5 Two public workshops were subsequently held with  
6 industry and other interested parties in March of 1995 and  
7 November of 1995. Rather than trying to characterize  
8 industry's perspective of the rule, as you mentioned, they  
9 have been invited here today and we will hear their  
10 presentation after ours.

11 Since members of the Commission have changed  
12 substantially since our rulemaking effort began in 1993,  
13 Staff has identified six alternative approaches for the  
14 Commission's consideration on how Staff might proceed in  
15 this area.

16 Next slide, please.

17 [Slide.]

18 MS. TENYCK: Listed on the viewgraph are six  
19 proposed alternatives. Let's begin with alternative two,  
20 which is currently the status quo.

21 In the early 1990s, when weaknesses were  
22 identified in the regulatory program, the licenses of seven  
23 major fuel facilities were in timely renewal. The renewal  
24 process had to proceed along with the rulemaking process so  
25 Staff subsequently encouraged licensees to voluntarily

1 commit to performing an integrated safety analysis and to  
2 maintain that ISA for use in licensing activities.

3 In effect, what we were doing is we were trying to  
4 implement generic changes to correct identified weaknesses  
5 without the benefit of a rulemaking.

6 Next slide, please.

7 [Slide.]

8 MS. TENNEYCK: Staff feels that there are  
9 significant disadvantages of trying to license under the  
10 current Part 70 particularly since it doesn't adequately  
11 address the performance of an ISA, criticality prevention,  
12 chemical process safety and fire protection. It is also  
13 silent on the protection of external events such as a  
14 seismic event, except at a plutonium facility.

15 Next slide, please.

16 [Slide.]

17 MS. TENNEYCK: We have found that reliance on  
18 voluntary commitments to perform an ISA is not an effective  
19 and an efficient way to regulate because without formal  
20 requirements and implementing guidance, interpretations of  
21 what is an appropriate ISA can vary widely.

22 Staff feels that it is important to have a  
23 requirement for an ISA to systematically analyze the hazards  
24 from criticality, fire and chemical process safety and that  
25 it be kept current through a good configuration management

1 program, that it be thorough and that it be used to  
2 determine the impact of process changes.

3 Next slide, please.

4 [Slide.]

5 MS. TENNEYCK: Going back to the alternatives, I  
6 would like now to discuss alternative one, which basically  
7 represents -- I'm sorry, back to slide nine.

8 [Slide.]

9 MS. TENNEYCK: -- which basically represents  
10 licensing under the constraints under the current Part 70,  
11 without encouraging licensees to voluntarily commit to  
12 performing an ISA. That, in our mind, is just moving  
13 backwards, knowing the weaknesses that are with the current  
14 rule.

15 Alternative three proposes to amend Part 70 to  
16 require that an ISA be performed and maintained and  
17 commitments be made to identify items relied on for safety  
18 and to identify implementing measures to assure their  
19 continued availability and reliability.

20 Staff has responded other industry's concerns  
21 raised during our public meetings to establish -- their  
22 concerns that we require -- that multiple programs be  
23 established to provide this availability and reliability of  
24 the items relied on for safety. At the time, we had no idea  
25 of the connotation and the baggage that went along with the



1 term "program" so we have modified our proposal to require  
2 that they establish a safety program that requires -- that  
3 includes, I'm sorry, all of the measures that we feel are  
4 important like QA, maintenance, configuration management and  
5 whatever, and that they be applied to the items relied on  
6 for safety commensurate with the risk of the particular  
7 problem.

8 Next page -- I'm sorry, you're all on that one.  
9 I'm moving pages here.

10 Alternative four would amend the Part 70 similar  
11 to the amendment for alternative three, although in addition  
12 to requiring ISA, we would also require that the other  
13 weaknesses that have been identified within Part 70 be  
14 addressed such as reporting requirements. And, also, we  
15 would want to require that the licensees submit their  
16 application in a single, one-part format. Existing guidance  
17 encourages licensees to provide their application in two  
18 parts. The first part would require their commitments to us  
19 that are enforceable. The second part was, in essence, a  
20 discussion of their safety program which they were free to  
21 modify without NRC review and that wasn't binding. As a  
22 result of that, when we came to renewal time, the safety  
23 program that was described in the original application did  
24 not resemble in most cases their current program and it  
25 required a much more onerous renewal process than we feel is

1 necessary.

2 Alternative four would also include our  
3 requirements like reporting of the 91-01 type of loss of  
4 criticality controls and also would require the approval of  
5 NRC for an ISA for any new processes or new construction.

6 Alternative five, which is similar to the original  
7 Staff approach, would involve a rewrite of the Part 70 for  
8 to reorganize and restructure the rule and also to delete  
9 requirements that we feel are overly prescriptive and  
10 redundant. A new proposed approach is also included where  
11 we would separate the critical quantities of special nuclear  
12 material from Part 70 into a new part, thus leaving the  
13 existing Part 70 unchanged to address subcritical quantities  
14 which are similar to those licensed by agreement states and  
15 there we have a goal of comparable requirements so, in  
16 essence, we would not be affecting the agreement state  
17 program at all and we would have all of our subcritical  
18 quantity licensing in one part.

19 Alternative six would also be a modification which  
20 could include the alternative three, four or five but would  
21 grandfather the operations at existing fuel facilities from  
22 the requirement of having to perform an ISA because of their  
23 operating history. However, if they made any major  
24 modifications to their program, initiated any new processes  
25 or new construction, then we feel that an ISA should be

1 performed.

2 In summary, we have identified the weaknesses with  
3 the current Part 70 and have proposed a new risk-informed  
4 licensing approach to increase our confidence the margin of  
5 safety at licensed fuel facilities.

6 As directed by the Commission, we have discussed  
7 our proposed rulemaking activities with industry and have  
8 made some modifications to our rulemaking package based on  
9 that input.

10 Shortly you will hear their perspective on our  
11 proposed changes.

12 We will be faced in the near future with licensing  
13 new facilities, often using new technologies and we feel  
14 that it's important that we have a strong regulatory base to  
15 support our licensing efforts.

16 We also feel that it is important to have a good  
17 standard review plan so that we will have a predictable  
18 licensing process, so we have proposed six alternative  
19 approaches for your consideration and we now look for your  
20 direction as to which direction we should proceed.

21 That concludes my remarks.

22 CHAIRMAN JACKSON: Thank you.

23 MS. TENEYCK: If you think that I did not address  
24 your comments, the questions you had earlier I'd be happy to  
25 address them.

1 COMMISSIONER ROGERS: Maybe I missed them -- no, I  
2 don't think you did.

3 MS. TENEYCK: Okay.

4 COMMISSIONER ROGERS: I don't think you addressed  
5 on any kind of a quantitative basis or risk as we normally  
6 interpret risk as probability times consequences, or even  
7 the consequences themselves -- I didn't hear that -- and it  
8 seems to me that's -- we have to have something to put these  
9 systems into the overall perspective of everything we  
10 regulate -- reactors and all the way down to medical  
11 programs.

12 I don't -- I think if you are not prepared to do  
13 it right now, that's okay. I think that has to be done, but  
14 it does seem to me that at the moment we don't have the  
15 advantage of being able to put this in some kind of a risk  
16 perspective.

17 Also, I am a little uncertain as to what you  
18 really do mean when you are talking about ISAs. Are you  
19 talking about doing a PRA as part of that or not? In your  
20 list of alternatives, the word "risk" appears only in  
21 Alternative 5. You mention ISAs and it is only in  
22 Alternative 5 that you mention the word risk-informed. It's  
23 not clear to me that ISAs are being contemplated on a  
24 uniform basis involving a probabilistic risk assessment or  
25 not.

1 I know there was a great discussion a year or two,  
2 a couple of years ago, on the subject of risk in these  
3 facilities or hazards -- they used the word "hazards" that  
4 were not in general the end result of a probabilistic risk  
5 assessment. Many of them were qualitative assessments of  
6 potential hazards.

7 In other words, what I am trying to see is what  
8 are we talking about here when we are talking about an ISA.  
9 Are we all talking about the same thing? How does an ISA  
10 conceptually relate to an IPE for a nuclear power plant?  
11 Are they totally different kinds of animals or do they bear  
12 a certain kind of similarity to each other in terms of  
13 methodology and that is what, you know, I would like to hear  
14 something about.

15 MS. TENNEYCK: Okay. I'll be happy to respond to  
16 that.

17 The ISA concept is very similar to what is  
18 conducted in the chemical industry. It's not a new process.  
19 It's been around for a number of years and there's a number  
20 of ways to accomplish that. A PRA is one technique and in  
21 our guidance document that we developed, we identify a  
22 number of techniques that can be used to perform an  
23 Integrated Safety Analysis.

24 We recognize that the results from a fuel facility  
25 are not similar to the consequences that could result from a

1 nuclear power reactor but in our rule we do provide or plan  
2 to provide consequence limits that will identify when the  
3 licensees -- what they should be protecting against and any  
4 risks that would exceed those levels, and they are not as  
5 great as what would be at a power reactor -- we're currently  
6 contemplating, say, 5 rem at the site boundary -- but the  
7 events that could happen at a fuel facility are much more  
8 focused on affecting worker safety.

9           Individuals can be killed from criticalities.  
10 They can also be killed from hazardous chemicals that could  
11 result and fires could cause a significant dispersal of the  
12 nuclear material around and could cause health and safety  
13 problems.

14           But your concern from a PRA perspective, that is  
15 just one technique. Industry has indicated in their  
16 experience in conducting such things that a PRA is not  
17 always necessary, that it is more important that it be  
18 conducted by a team of individuals that are familiar with  
19 the facility and the process that as they go through the  
20 process they look at potential problems that could cause  
21 criticalities.

22           They look at chemicals that are used in a process  
23 and to identify any risks that they could pose to the  
24 process, and it has been determined that a very effective,  
25 Integrated Safety Analysis could be done without the use of

1 PRA.

2 We also find that PRA is a useful technique in  
3 power reactors when a lot of their systems are very similar  
4 and there's a lot of history on failures of equipment, but  
5 in our fuel facilities we find that they almost all are very  
6 unique, do not always use the same type of equipment, and so  
7 it does not lend itself to the performance of a PRA as well  
8 as a power reactor would.

9 CHAIRMAN JACKSON: Do you have any comments, Carl?

10 DR. PAPERIELLO: I would characterize -- you asked  
11 about the risk -- the risk in a fuel facility as mentioned  
12 is twofold.

13 The first is the chemical risk, the largest  
14 probably being characteristic of the rupture of a large UF-  
15 6 cylinder as occurred at Sequoyah Fuels with the  
16 accompanying consequences.

17 The other is an inadvertent criticality. If you  
18 look historically at the criticalities that have occurred,  
19 you are talking about killing nearby employees. Generally  
20 the lethal radius is in the order of tens of feet and  
21 offsite radioactive consequences are relatively small. They  
22 are far less than a reactor and probably bounded by more  
23 traditional chemical type accidents, but that is --  
24 obviously, it's not a reactor. You are not going to get  
25 devastation of large portions of the countryside that could

1     happen in a reactor.

2             It's within the range of comparable petrochemical  
3     accidents -- you know, refinery accidents and the like.

4             CHAIRMAN JACKSON: Given what you just said, two  
5     questions come to mind.

6             One is where would the alternatives -- how do they  
7     play? Have you done that kind of a juxtaposition of the  
8     alternatives that you have laid out to comparable regulatory  
9     requirements in the industrial chemical facility space  
10    because what you just said suggests that that is the  
11    comparison that is more apt.

12            So the question is where do these proposed  
13    alternatives lie with respect to regulatory requirements for  
14    those kinds of facilities?

15            MS. TENNEYCK: Maybe I can address that.

16            The hazards analysis that we are proposing is not  
17    that different than what OSHA and EPA have proposed. In  
18    fact, some of our licensees are interested in conducting the  
19    ISA in such a way that it satisfies the requirements of NRC,  
20    EPA and OSHA.

21            CHAIRMAN JACKSON: And have you done any order of  
22    magnitude or cost/benefit estimation of the alternatives  
23    that you presented?

24            MS. TENNEYCK: We had a regulatory analysis done of  
25    our original proposed draft. The alternatives that are



1 proposed to date we do not have cost/benefit analysis done  
2 on because we wanted to get direction from the Commission  
3 before we proceeded in doing any of them.

4           There is an upfront cost. We all recognize that  
5 it is going to be an expense and it can vary from site to  
6 site, but we have in discussions with licensees had  
7 indications that the results of the ISA have been useful and  
8 have identified potential problems that could have shut them  
9 down and that having a better understanding of the safety  
10 basis will in most cases allow them to operate and by being  
11 up and operational it will save them money in the future, so  
12 that is about as close from, you know, a detailed analysis  
13 that we have done although we did have some other cost  
14 analysis done but it wasn't a final product and it still  
15 needs to be refined.

16           CHAIRMAN JACKSON: Commissioner Dicus?

17           COMMISSIONER DICUS: No questions.

18           CHAIRMAN JACKSON: Let me ask you one last  
19 question.

20           You talked about reg guides, standard review plan,  
21 and implementing guidance. Presumably this is what was  
22 presented to the earlier Commission as a way to address some  
23 of the issues and concerns with the existing Part 70 or its  
24 implementation, is that correct?

25           MS. TENNEYCK: Yes, the Commission was satisfied

1 with the approach that we were taking to address the  
2 weaknesses.

3 CHAIRMAN JACKSON: And so the alternatives that  
4 you are presenting now are meant to be ones that would  
5 supersede doing those things, is that correct, or these  
6 things would be done with reference to whichever alternative  
7 is the --

8 MS. TENNEYCK: No. We would not propose to do  
9 anything other than to -- whatever way we modify the rule we  
10 feel it's very important that we have a standard review  
11 plan.

12 We feel that is an important document to be used  
13 to standardize the review process. In the past it was done  
14 on a more ad hoc basis. There were branch technical  
15 positions, various documents, but we think that a good  
16 standard review plan is imperative not only for use of the  
17 licensing staff in reviewing the applications but also for  
18 the use of the Applicant to know what acceptance criteria  
19 that the NRC will be using when they prepare their  
20 application and so that is a very important thing.

21 The standard format and content guide we feel is  
22 important because that gives guidance to the licensees on  
23 how they could prepare an acceptable application so we feel  
24 that those two are very important and we also feel that  
25 guidance such as that which we were developing to identify

1 techniques on performing an ISA are very important, so we  
2 don't propose that the rulemaking package be any different  
3 than how we have proposed it before. It's just a question  
4 as to how we proceed in modifying the current rule.

5 CHAIRMAN JACKSON: What happens in your  
6 development of a standard review plan, et cetera, what  
7 happens to things like the branch technical positions and so  
8 forth.

9 MS. TENNEYCK: They were incorporated into the  
10 standard review plan. Now let me tell you that we don't  
11 have a general consensus on what should be acceptable  
12 criteria at the time we started the development of this SRP.  
13 We basically had a lot of individual staff doing the best  
14 job that they could do with the lack of guidance but putting  
15 their own twist on what they felt was an acceptable system,  
16 so that there was a lot of meetings that brought together  
17 the Staff to come to a consensus on what was acceptable  
18 criteria.

19 Branch technical positions that had been used in  
20 the past certainly influenced these decisions but the  
21 perspective of basing it on the risk areas and addressing  
22 those things was a new perspective, because before the  
23 approach was to provide an across-the-board maintenance  
24 program or, you know -- we didn't have a maintenance  
25 program.

1           Let me give another example -- a radiological  
2 safety program. It was just layers of programs that were  
3 applied rather than taking the approach of looking at the  
4 high risk areas and applying the measures to those.

5           The entire approach that we proposed based on the  
6 ISA would be to not only focus the licensing on the high-  
7 risk areas, but to restructure our inspection program so  
8 that they inspect and focus on the high risk areas to ensure  
9 that the measures that are there to provide protection are  
10 indeed available and reliable, so we are changing our whole  
11 focus and that is to take, you know, an effort to turn to  
12 the Staff and bring them together in a consensus position  
13 and I think that we have that now but it wasn't there two  
14 years ago and we have been working on it all along, so I  
15 think that is something that this would give us that would  
16 be very useful for the process.

17           CHAIRMAN JACKSON: And your intent would be to  
18 remove overly prescriptive requirements in both -- either a  
19 new or an amended rule as well as any implementing guidance?

20           MS. TENNEYCK: Well, the way that the alternatives  
21 are laid out, the real alternative we would have to remove  
22 those prescriptive requirements would be on Alternative 5,  
23 where we would rewrite it.

24           In fact, it makes it a little difficult to even  
25 patch in the ISA approach into the current rule because of

1 all these existing prescriptive programs. It would be even  
2 probably more confusing to a new Applicant trying to  
3 understand the process then if we were able to rewrite the  
4 entire rule and strip out of it all of these prescriptive  
5 programs that are in there.

6 We feel our approach gives the licensees a lot  
7 more flexibility in defining their programs because they are  
8 going to identify the areas that are high risk and they will  
9 determine the important things, whether it be maintenance or  
10 QA or training that is necessary to assure the availability  
11 and reliability of those measures.

12 CHAIRMAN JACKSON: And it's not going to take you  
13 another five years?

14 MS. TENEYCK: No, ma'am. We are very, very close.  
15 As I say, we have the draft rule. We have already been  
16 thinking in these terms.

17 I think it would probably be harder to go back and  
18 try to patch something into the existing rule than to come  
19 up with a new rewrite.

20 CHAIRMAN JACKSON: Mr. Rogers? Do you have  
21 anything to add?

22 COMMISSIONER ROGERS: Well, just one little  
23 question of detail.

24 In Attachment 2 to the SECY 96-079, there was a  
25 reference to a Westinghouse submittal that pointed out the

1     remarkable agreement between a submittal -- I guess to us --  
2     and OSHA, an OSHA requirements submittal or conformance and  
3     something that might meet EPA requirements as well, and the  
4     comment was, I just have to paraphrase it because I can't  
5     remember the exact word, but essentially that it was  
6     remarkable agreement between those three documents that they  
7     were preparing.

8             My question is did they include an ISA and was  
9     that a quantitative ISA? In other words did it involve a  
10    PRA?

11            MS. TENNEYCK: I think that you could best ask that  
12    question to the Westinghouse representative that is here  
13    today.

14            COMMISSIONER ROGERS: I see, okay.

15            MS. TENNEYCK: Similar approaches can be used to  
16    satisfy all of our requirements and so I think that we  
17    certainly are supportive of an approach that would not be  
18    contrary to meeting the requirements of OSHA or EPA.

19            COMMISSIONER ROGERS: Thank you.

20            CHAIRMAN JACKSON: I note that both NRC Staff and  
21    industry talk about removing over-prescriptiveness and  
22    performance-based approaches.

23            Is there concurrence as to what "performance-  
24    based" means?

25            MS. TENNEYCK: No. I can say that very

1        emphatically. We have -- our position on performance-based  
2        rules are not prescriptively telling the licensee what they  
3        have to do, but allowing them the flexibility of telling  
4        them what we feel the requirement should accomplish and  
5        letting them have the flexibility of proposing to us how  
6        they would plan to meet that.

7                We have heard many other definitions of  
8        performance-oriented rules and I would suggest maybe you  
9        might ask industry what their definition is of performance-  
10       oriented.

11               CHAIRMAN JACKSON: Okay. Any other questions?  
12       Commissioner Dicus?

13               COMMISSIONER DICUS: I have none.

14               CHAIRMAN JACKSON: Well, thank you very much. I  
15       think we'll hear from the industry and other  
16       representatives. Thank you very much.

17               Mr. Bishop, you are leading the group?

18               MR. BISHOP: Yes, ma'am, I am.

19               Chairman Jackson, Commissioner Rogers,  
20       Commissioner Dicus, for the record my name is Bob Bishop. I  
21       am Vice President and General Counsel of the Nuclear Energy  
22       Institute. Mr. Colvin sends his regrets that he was not  
23       able to appear here today. He asked me to appear in his  
24       stead because I have some experience in these matters as  
25       well.

1 I am here on behalf of the nuclear energy industry  
2 which has focused its activities with respect to the  
3 regulation of facilities licensed under Part 70 through an  
4 NEI committee called the Facility Operations Committee. You  
5 may hear us refer to the FOC. That is what that focus is.

6 CHAIRMAN JACKSON: Excuse me, Mr. Bishop. Just  
7 for the record, would you introduce the other gentlemen at  
8 the table?

9 MR. BISHOP: Yes, ma'am. On my right is Mr. Fici,  
10 manager of Westinghouse's Columbia, South Carolina, fuel  
11 fabrication plant. On my left, Charlie Vaughan, responsible  
12 for regulatory and environmental health and safety matters  
13 at General Electric's Wilmington, North Carolina, fuel  
14 fabrication plant.

15 I should mention in the audience today are also a  
16 number of other individuals with similar direct  
17 responsibilities for fuel fabrication facilities licensed  
18 under Part 70 that also represent that important sector of  
19 the industry. Specifically here today are plant managers or  
20 senior staff members representing Westinghouse and General  
21 Electric. At the table, ABB Combustion Engineering, Babcock  
22 and Wilcox, Framatome Nuclear Fuel Services and Siemens, the  
23 major fuel fabrication facilities, and representatives of  
24 other Part 70 licensees as well. I think that is an  
25 important sign of the importance that the industry feels



1 about this issue.

2 I will begin our presentation today with a broad  
3 overview of the situation from our perspective and what we  
4 believe is critically important. That is developing a  
5 regulatory framework that makes sense.

6 Messrs. Fici and Vaughan will then provide the  
7 industry's recommendations in more detailed fashion based on  
8 their direct licensing and operating experience and, of  
9 course, at any time we would be willing to answer any  
10 questions you might have.

11 First and foremost throughout our discussion  
12 today, I believe it is important to recognize that neither  
13 the regulated licensees nor the NRC have concluded that  
14 additional or different regulation of Part 70 fuel  
15 fabrication facilities is necessary to ensure adequate  
16 protection of public health and safety or the safety of the  
17 many employees and contractors who work at our facilities.

18 Yes, mistakes have been made at individual  
19 facilities, errors have occurred. And, yes, events have  
20 occurred that we all wish have not occurred. But we have  
21 learned from those experiences and we will continue to work  
22 to make sure that they will not happen again.

23 We have taken actions in response to that, to  
24 those events and errors, that included the modification of  
25 safety programs, emphasizing to our people the need to do

1 the right thing as well as modifying our operating  
2 practices, systems and components to be more effective.  
3 There can be no question that the plants now have even  
4 improved margins of safety because of those voluntary  
5 efforts on the part of licensees.

6 An independent assessment conducted for the NRC  
7 Staff now two years ago by Science and Engineering  
8 Associates goes precisely to that point. The NRC Staff's  
9 consultant concluded that:

10 "Part 70 licensed facilities are not unsafe, as  
11 currently operated and regulated. This is attested to by  
12 the fact that there have been relatively few accidents  
13 involving SNM, special nuclear material, at Part 70 license  
14 sites, and no member of the public has been injured due to  
15 such accidents. In addition, there have been no criticality  
16 events at Part 70 license sites since the NRC was created in  
17 1974 and assigned oversight responsibility for SNM  
18 activities."

19 The obvious conclusion, the defense in depth  
20 approach to plant design and operation has proven to be  
21 valid at Part 70 facilities.

22 The consultant's report went on to observe:  
23 However, events have occurred at these facilities,  
24 particularly at fuel cycle facilities, that could possibly  
25 lead to more serious events or accidents.

1           The NRC Staff's principal articulation to us as  
2 well as in this briefing today of why a dramatically  
3 different regulatory system should be imposed has been based  
4 on the NRC Staff's concerns about their lack of confidence  
5 in the margin of safety that now exists. Phrased earlier, a  
6 so-called record of upsets that has occurred and that the  
7 current regulatory system is "haphazard", a confused way of  
8 licensing. Let me address those briefly in turn.

9           We have analyzed the record of upsets in a  
10 document labeled Additional Discussion of Part 70 Operating  
11 Experience. We have made copies available in the meeting  
12 room, to commissioners and to Staff. We ask that that  
13 analysis be included with the transcript of this briefing  
14 and the record of this proceeding.

15           This analysis demonstrates that, in the events  
16 analyzed by the NRC Staff, there always remain substantial  
17 margins of safety and conservatisms that continue to ensure  
18 public health and safety.

19           As to the second point that the current regulatory  
20 system is haphazard, the current system may not be elegant,  
21 I believe was the word the Staff used in the Commission  
22 briefing last year, but I think it is clear it has also  
23 worked. The major reason for the so-called haphazard system  
24 is that the current system was designed to work to  
25 accommodate a wide variation of types of facilities licensed

1 under Part 70. That is not a flaw in the current system;  
2 that is a virtue of the current system.

3 The industry has been concerned during the last  
4 five years that the NRC Staff has been considering a variety  
5 of changes to the regulatory system that the potential  
6 impact on licensees of those changes has not been carefully  
7 evaluated. First, many of the changes being considered and  
8 that are among the alternatives before the Commission today  
9 would not achieve benefits that are in any way commensurate  
10 with the cost of implementing those changes. Second, many  
11 of the changes under consideration could have unintended  
12 consequences that could, if only through a diversion of  
13 resources, in fact end up being adverse to the public  
14 interest.

15 Because of these concerns, we were heightened when  
16 the Commission directed the Staff last year to discuss these  
17 matters with the major fuel cycle licensees. Today's  
18 presentations reflect the benefit of the significant  
19 interactions that have taken place over that past year  
20 between your Staff and the industry.

21 As Messrs Fici and Vaughan will describe, both the  
22 NRC and the industry have benefitted significantly from  
23 those discussions. We think the stage is now set for  
24 developing a process that will address the heart of the NRC  
25 Staff's concerns yet provide real value to Part 70

1 licensees.

2 Let me turn first to Mr. Fici to provide an  
3 overview of the industry's perspective on this important  
4 matter and then turn to Mr. Vaughan to provide a more in-  
5 depth review.

6 MR. FICI: Good morning, Chairman Jackson,  
7 Commissioner Rogers, Commissioner Dicus. I am Jim Fici of  
8 Westinghouse and I am pleased to be here today to not only  
9 represent Westinghouse but all of the fuel cycle companies  
10 that operate facilities licensed under Part 70. All of the  
11 major Part 70 licensees are here today as authors of this  
12 presentation and I have spoken with all my counterparts and  
13 we are of a like mind.

14 Over the last several years, the Staff and the  
15 industry have discussed and debated Part 70 at some length  
16 in meetings, workshops and other forums. By and large, the  
17 industry has been opposed to major revisions to the rule.  
18 This is primarily because we are convinced that Part 70 fuel  
19 facilities are being operated safely under the existing  
20 regulations. The recently completed NRC plant performance  
21 reviews of three of our facilities bear out our conviction.  
22 Furthermore, the Staff has concurred with that assessment,  
23 but still apparently desires increased confidence in the  
24 safety of our operations.

25 After our last workshop with the Staff in November

1 of 1995 and after careful review of SECY 96-079, we have  
2 come to the unanimous conclusion that our mutual goal, to  
3 maintain and improve the margin of safety of our facilities,  
4 would best be served if some carefully designed regulatory  
5 changes were implemented. Therefore, the main focus of our  
6 presentation today is on those areas where we feel we can  
7 move forward on a cooperative basis.

8 I want to stress that these recommendations have  
9 been unanimously endorsed by all represented companies  
10 operating fuel cycle facilities licensed under Part 70.

11 I would like to briefly summarize the major  
12 elements of our recommendations. First, while we opposed  
13 major changes to Part 70 in the past, we proposed that a  
14 focused and performance-based addition to the existing rule  
15 could potentially be beneficial. We are willing to work  
16 with the Staff to achieve that change. Second, and more  
17 particularly, we could embrace a specific change to the  
18 existing Part 70 that would require licensees to address  
19 plant safety hazards using an integrated approach.

20 Licensees could either perform a reasonable scope  
21 integrated safety assessment, ISA, as we expect most will  
22 do, or use an acceptable alternative approach determined to  
23 be acceptable by the industry and the NRC. The change would  
24 explicitly provide for both options.

25 The change should also include: One, specific

1 measurable safety program performance objectives; two,  
2 reference to acceptable industry practices for performance  
3 of the ISA; and, three, the principle that individual  
4 licensees will determine what, if any, changes in existing  
5 facilities, equipment or controls are needed using a graded  
6 approach based upon the results of the ISA or alternative.  
7 Many of the Part 70 licensees have efforts under way or  
8 planned which they believe could satisfy such a rule change.

9 Third, until the ISAs or an acceptable alternative  
10 are completed and the results available for review, it is  
11 premature to decide what, if any, changes may be required in  
12 existing fuel, facilities or existing programs. Indeed, we  
13 feel the necessary safety programs are already in place at  
14 our facilities.

15 While the ISAs may help us adjust the  
16 implementation of those programs commensurate with risk, we  
17 would not expect the ISAs to disclose the need for  
18 significant new programs. Thus, at this stage, we believe  
19 that NRC and industry resources could be saved by suspending  
20 work on the draft rule, standard review plan and standard  
21 format and content guide. These draft documents contain  
22 significant new programmatic criteria in areas such as  
23 quality assurance, maintenance, chemical safety, fire  
24 protection, training and human factors. The need for such  
25 changes should be driven by the ISA results on an individual

1 plant basis.

2 Completion of these guidelines and documents in  
3 their current form will create pressure to implement costly  
4 changes before the need for those changes is demonstrated.  
5 Indeed, this is already occurring. The Staff has  
6 acknowledged that it is encouraging licensees to follow the  
7 draft standard review plan and the draft standard format and  
8 content guide in their license renewal applications and is  
9 granting a more limited term license renewal that is five  
10 years rather than 10 years where licensees have not followed  
11 the draft guidance. We are very concerned that the Staff  
12 appears to be requiring licensees to follow draft guidance  
13 as a condition of receiving 10-year license renewals.

14 We are equally concerned that the draft guidance  
15 might become de facto inspection guidelines or acceptance  
16 criteria. Our recommendations would produce a more  
17 consistent application of requirements among the Part 70  
18 licensees.

19 Third, we believe that the Staff and industry  
20 should focus their resources on working out the details  
21 related to ISA methodology, scope and content and on the  
22 definition of acceptable alternatives. The NRC's draft  
23 guidance on performing an ISA, draft NUREG-1513 and the  
24 American Institute of Chemical Engineers' recommendations on  
25 which it is largely based are an appropriate starting point.



1 We would like to meet with the Staff to begin this process.

2 Finally, our proposal to establish a requirement  
3 for the performance of an ISA or an acceptable alternative  
4 approach does not mean that the ISA documentation or results  
5 should be incorporated into the safety basis of our  
6 facilities or formally submitted to the NRC. To do so, in  
7 our view, necessitates significant changes in the format and  
8 content of our license applications and represents a  
9 fundamental change in the way our facilities are regulated.  
10 ISA documentation and results would, however, be available  
11 for Staff review at each licensee's facility.

12 Now, in summary, we recommend that our mutual  
13 efforts be refocused on, one, Staff and industry discussions  
14 to work out the ISA methodology, scope and content and the  
15 parameters of alternative approaches and, two, a limited  
16 addition to the existing rule that would require licensees  
17 to continue to address safety hazards using an integrated  
18 approach through an ISA or an acceptable alternative. The  
19 change would define the quantitative safety performance  
20 objectives to be achieved.

21 We urge the Commission, however, not to finalize a  
22 change to the existing rule until there is a clear  
23 understanding and consensus on the details of the ISA or  
24 alternatives.

25 I would now like to ask Mr. Vaughan to elaborate

1 on the points I have just highlighted.

2 MR. VAUGHAN: Good morning, Chairman Jackson,  
3 Commissioner Rogers, Commissioner Dicus. The purpose of my  
4 discussion here is to provide some additional detail on the  
5 unanimous recommendations of the Part 70 fuel operators and  
6 I would like to begin by discussing some of our suggestions.

7 As a beginning point, it is essential that the  
8 regulation contain well-defined safety performance  
9 objectives that would be used to evaluate the potential  
10 facility specific hazards and safety consequences that  
11 should be of concern to the NRC and industry. As directed  
12 by the Commission and based on our history of interacting  
13 with the Staff, we stand ready to work with the Staff to  
14 develop performance objectives appropriate for our  
15 operations. These criteria would define the underlying  
16 objectives of any facility's safety program.

17 COMMISSIONER ROGERS: Could you give us any  
18 examples of such objectives?

19 MR. VAUGHAN: That is some of my next statement to  
20 discuss those and where we have some common understanding, I  
21 think.

22 The Staff has suggested certain criteria or  
23 consequences of concern that may be reasonable for inclusion  
24 in a proposed rule and are worthy of further consideration.  
25 Those criteria include compliance with Part 20 limits in

1 non-accident conditions, avoidance of criticality,  
2 thresholds for doses to members of the public, intake of  
3 soluble uranium and exposure to hydrogen fluoride.

4 In NUREG-1513, the Staff has stated that, and I  
5 quote, "Appropriate controls must be in place to provide  
6 reasonable assurance that any accidents identified in the  
7 ISA having these consequences will not occur."

8 CHAIRMAN JACKSON: Repeat that?

9 MR. VAUGHAN: Repeat it?

10 CHAIRMAN JACKSON: Please.

11 MR. VAUGHAN: "Appropriate controls must be in  
12 place to provide reasonable assurance that any accidents  
13 identified in the ISA having these consequences will not  
14 occur."

15 We agree and we feel that it is essential that the  
16 rule itself contain measurable safety performance  
17 objectives.

18 Next slide.

19 [Slide.]

20 MR. VAUGHAN: With safety performance objectives  
21 clearly defined, and the ISAs complete, the results should  
22 enable licensees to determine whether adequate controls are  
23 in place to prevent or mitigate credible events and  
24 accidents that, based on a realistic evaluation, could  
25 produce any of the consequences described above. If

1 credible event or accident sequences are examined and  
2 determined not to be reasonably capable of producing such  
3 consequences, no further consideration would be required.

4 Of course, for these events or accidents of lesser  
5 significance, would continue to be prevented and mitigated  
6 through the existing customary safety programs.

7 Where an accident or event could produce  
8 consequences exceeding those specified in the rule, however,  
9 the licensee would evaluate and document the controls relied  
10 on to prevent or mitigate the incident and take additional  
11 measures if necessary. Licensees would be permitted to take  
12 into account the anticipated likelihood of an event or an  
13 accident as well as the potential impacts in the process of  
14 grading its safety program.

15 Using these criteria, one approach to grading  
16 would be to classify structures, systems and components  
17 based on safety significance and to apply controls along  
18 with assurance measures commensurate with that  
19 classification.

20 Next slide.

21 [Slide.]

22 MR. VAUGHAN: The regulation should reference  
23 industry practices that may be used in the performance of an  
24 ISA. The 1992 American Institute of Chemical Engineers'  
25 Guidelines for Hazard Evaluation Procedures, Section Edition

1 with Work Examples, is frequently referenced in NUREG-1513  
2 and provides reasonable approaches to performing ISAs.  
3 Other methods may also be acceptable.

4 The regulation should also acknowledge that  
5 licensees are performing hazards analysis under other  
6 applicable requirements such as the Occupational Safety and  
7 Health Administration's Health and Safety Management  
8 Regulations and the Environmental Protection Agency's Risk  
9 Management Program Regulations. These efforts should be  
10 acceptable means of meeting ISA requirements for hazards  
11 within NRC's jurisdiction, namely hazards associated with  
12 radioactive materials, nuclear criticality and those  
13 chemical hazards that could affect nuclear safety.

14 Draft NUREG-1513 states that NRC's ISA guidance is  
15 intended to be consistent with the requirements of OSHA and  
16 EPA, so long as the ISA addresses radiological nuclear  
17 criticality and certain chemical hazards, for example UF6  
18 releases, not covered under other regulations. In this  
19 regard, we agree with the Staff.

20 There are various efforts under way at some fuel  
21 facilities to re-evaluate and/or redocument the current  
22 safety basis for their operations. Some of these ongoing  
23 efforts may fulfill the requirement of an ISA. In other  
24 cases a licensee may feel that it has an alternative  
25 approach or program for assuring itself of and demonstrating

1 to the NRC the safety of its operations.

2 The rule should provide flexibility for licensees  
3 to offer alternative approaches for the NRC's consideration.

4 Such approaches might not constitute a hazards  
5 analysis but could still provide the NRC with increased  
6 confidence in safety.

7 CHAIRMAN JACKSON: Can you give examples of such  
8 an alternative approach and how it would then tie in with  
9 the prior recommendations where you talked about the  
10 integrated approaches having to do with consequences of  
11 concern and how you would migrate from such an example of an  
12 alternative to that that would be different than what would  
13 be in the ISA?

14 MR. VAUGHAN: I believe that the guidance in the  
15 AICHE Handbook is probably the most currently used. Some of  
16 the facilities that are with our committee have indicated  
17 that there may be some other options and they might want to  
18 comment on that maybe when we finish our presentation, but I  
19 think generally we go along that line. It's just that we  
20 would like to reserve the right to be able to use some  
21 different techniques if those are appropriate and are  
22 acceptable to both parties.

23 CHAIRMAN JACKSON: Okay --

24 MR. BISHOP: We haven't identified them now. We  
25 think that may come out of the process.

1 CHAIRMAN JACKSON: Commissioner Rogers.

2 COMMISSIONER ROGERS: Yes. I didn't want to let  
3 you go either.

4 I think the really important aspect of ISA is the  
5 "I" -- the "integrated" and if one is looking at  
6 alternatives, do those alternatives scrap the integration,  
7 total system view of the safety analysis or do they differ  
8 in detail but not spirit from an integrated safety analysis  
9 that might be acceptable under the OSHA and AICHE  
10 approaches?

11 In other words, are you saying that you think the  
12 alternatives -- I mean just to put it very bluntly, do you  
13 think an acceptable alternative is one which does not do an  
14 integrated analysis of the facility?

15 MR. VAUGHAN: I believe that the "integrated" word  
16 or the integrated aspect is present in all of the options  
17 that we have talked about. It's one more in the mechanics  
18 of how you do that and the mechanics of how you record  
19 results and maintain those results.

20 COMMISSIONER ROGERS: All right.

21 CHAIRMAN JACKSON: Do all of the alternatives  
22 allow the graded approach to implementation that the ISA as  
23 presumably you and the Staff understand allows?

24 MR. VAUGHAN: I believe so.

25 CHAIRMAN JACKSON: Because it strikes me that if

1 (a) the focus does not remain on an integrated safety look,  
2 as Commissioner Rogers has pointed out, and (b) does not  
3 allow for consistent understanding and approach in terms of  
4 a graded implementation if that were what were adopted, then  
5 what you are really positing is to leave things at the  
6 status quo, it strikes me.

7 MR. BISHOP: I believe we think those two  
8 principles, those two elements of the ISA, would be critical  
9 to any approach that is considered.

10 Part of our concern is that we know we don't know  
11 everything we need to know and that is what we would intend  
12 to work with the Staff to develop these thoughts further and  
13 we may come up with something that we don't now envision.

14 CHAIRMAN JACKSON: Okay, so these are new things  
15 that the Staff has not heard about yet? Is that what you  
16 are telling us?

17 MR. BISHOP: Our recommendation today? Yes,  
18 ma'am.

19 CHAIRMAN JACKSON: I see. What have you guys been  
20 discussing for five years?

21 [Laughter.]

22 MR. BISHOP: We may need to extend the time for  
23 the briefing.

24 MR. VAUGHAN: Let's see if we could have the next  
25 slide.



1 [Slide.]

2 MR. VAUGHAN: The rule should specify that upon  
3 completion of the ISA or acceptable alternative each  
4 licensee will determine what if any changes in existing  
5 controls are needed to provide reasonable assurance that the  
6 numerical safety performance objectives are not exceeded and  
7 will implement such changes in a timely manner.

8 It should also specify --

9 CHAIRMAN JACKSON: Does that mean with all  
10 deliberate speed?

11 MR. BISHOP: Yes, ma'am.

12 MR. VAUGHAN: Yes. It should also specify that  
13 the ISA results indicate that relaxation of some controls or  
14 reallocation of resources is justified, that the licensee  
15 may do so in accordance with any applicable license  
16 amendment or commitment change procedures.

17 The Staff has indicated that safety program  
18 changes should be based on the results of an ISA. However,  
19 the preliminary draft provisions to Part 70 and the draft  
20 SRP and SF and CG prematurely include detailed new safety  
21 program criteria.

22 Among these new criteria are criteria for  
23 implementation of very rigorous QA programs following the  
24 guidance of NQA1, which is not justified by the potential  
25 source term and risk associated with Part 70 facilities.

1           New criteria for much more formal maintenance  
2 programs, criteria for reactor style training programs using  
3 formal systems approach to training methodology,  
4 prescriptive new criteria on criticality safety, fire  
5 protection, and human factors programs and criteria for  
6 expanded reporting requirements.

7           We do not believe that the NRC should presuppose  
8 the need for programmatic changes before completion of the  
9 ISAs or acceptable alternatives.

10           The inclusion of these changes in the preliminary  
11 draft rule and in the draft SRP and SF and CG are based upon  
12 the Staff's assessment of prior industry events, some at  
13 Part 70 facilities and some at other types of facilities.

14           That assessment does not take into account the  
15 current status of the industry's operations as shown by the  
16 results of the recent NRC-conducted plant performance  
17 reviews at three Part 70 facilities, each of which noted a  
18 good level of safety performance.

19           The Staff's analysis of prior industry experience  
20 is discussed in Attachment 3 to their paper entitled,  
21 "Improving the Regulation of Fuel Cycle Facilities." That  
22 is dated November the 7th, 1995.

23           We have reviewed the Staff's analysis and we are  
24 providing an attachment to this presentation which discusses  
25 the results of our review and, as asked earlier, we have

1 asked that that be included in the transcript of the  
2 meeting.

3 Our basic conclusions are that the events  
4 evaluated by the Staff highlighted the need for  
5 improvements in our operations. For those events discussed  
6 by the Staff which we have specifically analyzed there were  
7 existing substantial margins of safety and conservatisms  
8 that continued to assure public safety.

9 Though instances of the loss or degradation of a  
10 single control criticality safety parameter have occurred,  
11 the double contingency principle and conservative  
12 assumptions built into the criticality safety analysis have  
13 served effectively to prevent accidental criticality events.

14 Finally, lessons learned as a result of such  
15 events as well as continuing efforts to make cost effective  
16 improvements in our program have provided the industry with  
17 an even larger margin of safety than existed several years  
18 ago.

19 These improvements it seems have gone  
20 unrecognized.

21 SECY 96-079 suggests that to address the  
22 industry's concern with the programmatic aspects of the  
23 draft rule it could be revised to require a "single safety  
24 program" and to refer to the various individual safety  
25 programs, for example, chemical safety, training, and human

1 factors, as "measures" rather than individual programs.

2 It is important to make clear that whether such  
3 programmatic changes are included in a rule, in guidance  
4 documents, implemented through inspection activities, or as  
5 the Staff suggested, redefined as measures to be included in  
6 a single safety program, they are premature and not  
7 justified at this juncture.

8 They do not provide clear, cost effective and  
9 measurable safety improvements.

10 Next slide.

11 [Slide.]

12 MR. VAUGHAN: The rule change we propose would  
13 require that the ISA results be documented and available for  
14 review by the Staff.

15 This would include a discussion of the controls  
16 relied on to assure that the consequences of concern are not  
17 exceeded and the basis for concluding such controls are  
18 adequate. A formal submittal to the NRC of an ISA report  
19 would not be required.

20 More importantly, the ISA should not become part  
21 of the license which may only be changed through a codified  
22 change process.

23 In accordance with our configuration control  
24 programs when significant plant changes occur or are  
25 planned, licensees would be required to review and update

1 the ISA and to implement any new controls that may be  
2 necessitated as a review of that re-review and updating of  
3 the safety basis.

4 Incorporation of the ISA itself into the license  
5 would necessitate significant changes in the current license  
6 application format, dramatically expanding the description  
7 of the plant site, facilities, equipment, processes, and  
8 controls which would form the basis of license.

9 In this regard we note for example that the  
10 certification applications recently submitted by the United  
11 States Enrichment Corporation under 10 CFR Part 76 criteria,  
12 which is very, very similar to those in the drafts of Part  
13 70, including the Standard Review Plan and Standard Format  
14 and Content Guide included over 1000 pages per plant  
15 dedicated to site, facility and process descriptions and  
16 safety or accident analysis.

17 This is a very significant administrative burden  
18 which would produce no measurable improvement in the safety  
19 of Part 70 facilities.

20 Next slide. Well, that is the correct one up  
21 there now.

22 Finally, to assure that future modifications to  
23 fuel facilities operations caused by regulatory change are  
24 based on strong health and safety considerations and are  
25 appropriately cost justified, we repeat our strong request

1 for the inclusion of a backfit provision in the revised Part  
2 70.

3 Modifications resulting from new or different NRC  
4 requirements or Staff positions must be subjected to an  
5 appropriate backfit analysis before implementation. This  
6 provision would be consistent with NRC regulations governing  
7 the gaseous diffusion plants and commercial reactors.

8 Thank you for your consideration and deliberation  
9 on this very important point this morning and I'll give the  
10 microphone back to Mr. Bishop.

11 CHAIRMAN JACKSON: Before you do, there was I am  
12 told a near-criticality event at GE-Wilmington some years  
13 ago and the question I had was was there a double  
14 contingency built in in that particular case?

15 MR. VAUGHAN: There was. The double contingency  
16 program or that approach was in place in that particular  
17 situation.

18 CHAIRMAN JACKSON: And what does near-criticality  
19 mean then in that particular situation?

20 MR. VAUGHAN: Near-criticality as best I can tell  
21 in that case simply says that one of the contingencies was  
22 lost and so we were in a position that we had then a single  
23 contingency.

24 CHAIRMAN JACKSON: Okay. Commissioner Rogers.

25 COMMISSIONER ROGERS: Well, a couple of questions

1 then of general observation.

2 How would an ISA help you to decide on what  
3 training programs should be in place to keep people over the  
4 years alert to criticality questions and how to avoid them?

5 It does seem to me that in various parts of our  
6 industry, not only in your applications but others, that  
7 criticality training and awareness is in danger of  
8 disappearing -- let's put it that way -- and that as time  
9 goes on, while it may be certainly possible to train up new  
10 people to carry out routine operations in the plant, the  
11 basic understanding of how something might lead to a  
12 criticality could get lost if your training programs don't  
13 address that, and it seems to me that's a common feature to  
14 all of these facilities and I don't know why something like  
15 that has to come out of an ISA.

16 MR. FICI: Let me see if I can respond to that  
17 question.

18 First of all, Commissioner, I think the inherent  
19 characteristics of the processes in our facilities do  
20 protect against criticality events, but an integrated safety  
21 assessment I think would point out where appropriate  
22 engineered controls could provide even greater margin to  
23 safety or, if that wasn't practical, where administrative  
24 controls are also appropriate, and that is where in the  
25 application of administrative controls you would focus a lot

1 of your training.

2 But in many of our facilities we conduct  
3 periodic -- I believe in our facility it is every two  
4 years -- criticality safety training with all of our  
5 employees so I don't agree with your statement that that  
6 kind of training is disappearing.

7 COMMISSIONER ROGERS: Well, it may or may not, but  
8 I am just telling you that throughout the industry the  
9 background that people come into the industry is changing  
10 and an understanding of criticality events and what  
11 criticality is is disappearing.

12 We have seen a number of instances in other  
13 situations where people who have been moving things around  
14 for example just didn't understand the potential for  
15 criticality in some fuel storage situations.

16 I don't agree with you that this is not an issue.

17 I think it is an issue and what we are talking about is a  
18 general issue for the whole industry. You may have ongoing  
19 training programs at your particular site, but we are  
20 talking about a rule now that involves everyone and I don't  
21 think that should be based on what may or may not be  
22 happening at one licensee's facility.

23 MR. VAUGHAN: I would like to add a little to that  
24 because I think there is a lot of benefit from the ISA and  
25 your observations are correct. The number of professionals



1 that are entering the industry today that are trained in  
2 criticality safety are on the way down, so they are a  
3 resource that is very difficult to come by and that is of  
4 concern to us and we are working at it, as I am sure you  
5 are.

6 But if we get to the ISA, I think one of the  
7 beauties of the ISA is, number one, it does give you an  
8 integrated look so that you look at all of the components of  
9 safety and you also have an opportunity to rank those so you  
10 know what is important.

11 One of the things that happens to us today is the  
12 rules are the requirements are the rules are the  
13 requirements and they all generally have equal weight, so  
14 you are faced with trying to train, for example, if you are  
15 looking at training, you are faced with trying to train  
16 everybody to everything to the same degree of detail and  
17 that is a very difficult challenge.

18 Under the concept of the ISA, we would be looking  
19 at it in an integrated fashion. We would come out with the  
20 ranking so we would know where the most serious risks are,  
21 where the highest probabilities are for things to happen,  
22 and so we would get a hierarchy of things that we should be  
23 addressing and that way if it is training or whatever the  
24 programmatic element is that we need to have that assurance,  
25 then we can add those things --

1 COMMISSIONER ROGERS: Oh, yes.

2 MR. VAUGHAN: -- in an graded, weighted approach  
3 and I think we can do a better job of implementing those  
4 things under those kinds of conditions than we can today so  
5 I think the ISA actually will help in that regard.

6 COMMISSIONER ROGERS: Oh, I would agree with that,  
7 but it seems to me we are talking about a floor here now of  
8 training that I think, a commonality that might be  
9 appropriate for everybody and then in addition to that the  
10 local application of these considerations is of course  
11 vitally important so I would agree with you there.

12 Well, the general observation is that it does seem  
13 to me -- I hadn't seen your set of slides here before I came  
14 in -- and the last word that I understood was that you folks  
15 were basically opposed to a rule and it seems to me that now  
16 that is not the case, that you have begun to come to a  
17 conclusion that there might be some virtue to a rule provide  
18 that -- and then some conditions have to be met.

19 So I do think that in response to the Chairman's  
20 question of what have you been talking about for five years,  
21 a lot of that has been don't have a rule and I think now you  
22 have come to a recognition that maybe this is the time to  
23 consider a rule and consider it seriously and get on with  
24 the job of doing something constructive and I wonder why,  
25 for example, now that you have come to a conclusion that a

1 rule might be in your best interest, why don't you file a  
2 petition for rule-making that states what it is you want to  
3 see in a rule instead of trying to tinker with something  
4 that the Staff has put together that you are not very happy  
5 with?

6 MR. BISHOP: Absolutely, and I should have  
7 apologized earlier for springing these slides, this  
8 information, this approach on you with no notice.

9 CHAIRMAN JACKSON: You should.

10 MR. BISHOP: Yes, ma'am.

11 [Laughter.]

12 MR. BISHOP: Let me just say in my own modest  
13 defense, that's because we were hammering it out as late as  
14 yesterday --

15 COMMISSIONER ROGERS: This morning.

16 [Laughter.]

17 MR. BISHOP: -- but we did finish it yesterday  
18 evening but we do think there is merit in going forward.

19 We do think, however, it is important to make sure  
20 that we agree first, before we establish what the rule  
21 should say and require, what is the heart of it, what is the  
22 principles that we are trying to achieve, what is the scope,  
23 format, content of the ISA. How would it be used? How  
24 would it be developed? Are there acceptable alternatives  
25 and what would the parameters of them be?

1           We think it is much more important to ensure that  
2   we understand what we are trying to accomplish through that  
3   rulemaking than begin the process of rulemaking before that  
4   stabilized.

5           COMMISSIONER ROGERS: Well, that's what I am  
6   suggesting that you do.

7           MR. BISHOP: Certainly.

8           COMMISSIONER ROGERS: Put that down and come to  
9   submit a petition for rulemaking that says what it is you  
10   think it ought to be and why.

11           Then that starts a process. It's a public process  
12   that everybody can observe. It's not in secret.

13           MR. BISHOP: Yes, sir.

14           COMMISSIONER ROGERS: And come to grips with the  
15   problems. Right now we seem to be not making an awful lot  
16   of progress when the Staff presents to us six different  
17   alternatives than perhaps none of which are the best and I  
18   would encourage you to get on with the job and -- having  
19   come to the conclusion that a rule is probably the best  
20   thing to do.

21           MR. BISHOP: Our approach -- we do know how to  
22   prepare petitions for rulemaking. Our approach however is  
23   to begin, with your concurrence to work immediately with the  
24   Staff to develop the concept of the ISA and make it real.

25           CHAIRMAN JACKSON: I think you need to get the

1 petition in if you do it, because, you know, you have been  
2 talking for five years and my point of view is that you  
3 can't just keep going on and on and decide you are going to  
4 get into the morass of, you know, we have to agree on all  
5 the details of what an ISA has to be before you get on with  
6 the fundamentals of what it is supposed to accomplish and so  
7 I would disagree with that, but if you would like to see a  
8 rulemaking that has certain baseline principles involved, I  
9 agree with Commissioner Rogers that you need to go ahead and  
10 submit the petition.

11 I do not think it is acceptable to get into a  
12 long-winded, let's negotiate again, so Commissioner Rogers  
13 will be long gone, Commissioner Dicus might be long gone, I  
14 might be long gone, and then you are starting it over and  
15 over again, and that it a piece in terms of regulatory  
16 process that I think is unacceptable, and so, you know, if  
17 we want to make a move we make the move and it is not  
18 something that should take five years to come to closure.

19 MR. BISHOP: Agreed.

20 CHAIRMAN JACKSON: And that you don't get into the  
21 morass of we're going to negotiate every little piece before  
22 we come forward because if you don't do that, then we're  
23 going to more forward anyway, considering the alternatives  
24 or something that the Commission itself might decide that it  
25 wants to do.

1           So Commissioner Rogers has also opened a window  
2   that I agree with but I am saying to you that it's not one  
3   that is going to be based on we're going to get agreement on  
4   all of these details before we move forward because we are  
5   not going to wait that long.

6           MR. BISHOP: Yes, ma'am. I understand.

7           CHAIRMAN JACKSON: Commissioner Dicus, did you  
8   have comments?

9           COMMISSIONER DICUS: No, they have been asked.

10          CHAIRMAN JACKSON: So thank you --

11          MR. BISHOP: Yes, ma'am. We thank you.

12          CHAIRMAN JACKSON: -- for coming. It's been very  
13   informative and stimulating and I think that I have already  
14   delivered the message to you and it has been an interesting  
15   and excellent presentation. Thanks -- we are adjourned.

16                 I'm told the meeting is not adjourned. I didn't  
17   realize that the representatives from DOE were planning to  
18   make comments. If that is true, I ask you to come forward  
19   and make what comments you would like to make at this time.  
20   Identify yourselves as you do that.

21          MR. VIETH: Good morning, Madam Chairman,  
22   Commissioner Rogers, Commissioner Dicus. My name is Don  
23   Vieth and I am with the U.S. Department of Energy's Richmond  
24   Operations Office. My position is the Senior Technical  
25   Advisor for the Tank Waste Remediation System Program

1 Office. The mission of the Office is to establish the  
2 system necessary to retrieve, process and convert to a  
3 stable solid suitable for disposal the 240,000 metric tons  
4 of process chemicals mixed with about 250 megacuries of  
5 radionuclides contained in 177 tanks at Hanford.

6 Since August of 1994, one of my responsibilities  
7 has been to examine and outline the means by which the  
8 remediation of the tanks can be achieved through privatized  
9 operations. The Department has determined that it is  
10 possible to make this fundamental change. It has  
11 established a two-phased approach and it has issued a  
12 request for proposal. Phase I will be initiated in August  
13 of 1996, that is just next month, with the signing of the  
14 contracts for services for the demonstration scale  
15 facilities. Phase II is planned to be initiated in 2004 for  
16 the procurement of services for the full production scale  
17 facilities.

18 The privatization of the TWRS will result in the  
19 purchase of a service on a fixed-price basis from a  
20 contractor-owned, contractor-operated facility. DOE will  
21 provide highly radioactive feedstock and receive vitrified  
22 waste suitable for disposal in return.

23 For the TWRS privatization, our principal tenet  
24 from the outset has been the intention of transitioning to  
25 external -- that is, non-DOE -- regulation of the

1 privatization contractors. Environmental regulatory  
2 oversight will be by state agencies. The occupational  
3 safety -- for occupational safety, the Department is looking  
4 to the Occupational Safety and Health Administration for  
5 regulation.

6 DOE has sought external radiological nuclear  
7 safety regulation by NRC but both agencies have concluded  
8 that the NRC currently does not have the capability to  
9 execute their role in a demonstration phase of the TWRS  
10 privatization consistent with the schedule of the consent  
11 order for remediation of defense waste. The radiological,  
12 nuclear and process safety management of the contractors for  
13 the demonstration phase will be directly regulated by DOE in  
14 a manner defined by the terms and conditions of the  
15 contract. In anticipation that NRC may regulate the  
16 production phase that is beginning in 2004, DOE intends to  
17 regulate in a manner consistent with NRC principles and  
18 concepts.

19 The TWRS privatization program has chosen to base  
20 its regulatory program on an integrated safety management  
21 approach. This approach extends the compliance basis for  
22 demonstration of safety by DOE contractors to a clear  
23 responsibility by the contractors for safety on a continuing  
24 basis across the span of contractor activities.

25 Consistent with applicable laws and within the



1 context of a thorough hazard analysis, the contract, subject  
2 to a DOE sanctioned process, identifies a set of standards  
3 or safety requirements and standards tailored to the  
4 contractor's activity. The contractor certifies that when  
5 approved by DOE and implemented by the contractors, the set  
6 of safety standards covering the contractor facility will  
7 provide adequate safety, complies with applicable  
8 regulations and conforms to the DOE's sanctioned top-level  
9 safety principles. Among the top-level safety principles  
10 are the IAEA, basis for safety principles for nuclear power  
11 plants that is 75 NSEG 3. The principles also appear  
12 generally in the NRC's proposed method for regulating major  
13 material, that is NUREG-1324.

14 Along with the concept for the proposed amendment  
15 to 10 CFR 70, the TWS regulatory program is based on an  
16 integrated safety management. The benefits to be realized  
17 from the integrated safety management include an integrated  
18 approach to safety across the full set of hazards,  
19 radiological, nuclear and chemical process safety and plant  
20 safety, incident to the contractor's activities. It  
21 provides an integrated evaluation basis for balanced control  
22 of hazards, emphasizes the contractor's responsibility and  
23 ownership for integrated, continuous safety of the  
24 contractor's activities, not just compliance with a set of  
25 requirements imposed by law or by the DOE. It provides

1 improved certainty for regulation of DOE, the Tank Waste  
2 Remediation privatization contractor and provides in  
3 combination with privatization incentives for effectiveness  
4 and efficiency.

5 During DOE regulation of the TWRS privatization  
6 demonstration phase, NRC modification of its rules with  
7 knowledge of lessons learned from the DOE regulatory  
8 experience from TWRS to emphasize integrated safety  
9 management is expected to enhance both DOE's and NRC's  
10 ability for the seamless transfer -- that is, if it  
11 occurs -- to the regulation of the TWRS privatization  
12 contractor. That is, going from DOE to NRC.

13 In addition to efficiencies that could be achieved  
14 by the two agencies, the continuing stable integrated safety  
15 management regulatory bases are expected to enhance  
16 contractors' efficiencies and effectiveness. The TWRS  
17 regulatory program for privatization contractors supports  
18 the principles of integrated safety analysis, planning and  
19 management in NRC's 10 CFR 70.

20 Thank you.

21 CHAIRMAN JACKSON: Thank you.

22 MR. BURTON: I think Mr. Wooley was supposed to  
23 speak first in the order of things but, if he isn't here,  
24 I'll go ahead.

25 Good morning, Chairman Jackson, and Commissioners

1 Rogers and Dicus. I thank you for the opportunity to be at  
2 this meeting. My name is Harold Burton. I am Senior Vice  
3 President at SCIETECH, Incorporated. We are a technical  
4 services company specializing in nuclear safety.

5 I participated as an invitee to the November 1995  
6 workshop and my discussions are a matter of record in that  
7 discussion. My reasons for speaking today are two-fold.  
8 From 1987 to 1990, I led the design, construction and  
9 licensing of the new AGU fuel fabrication facility and  
10 Category I storage facility for UNC Naval Products. The  
11 licensing was performed to, I would call it, again newly-  
12 revised Part 70 regulations because they were under  
13 continuous revision. While this was a license for a new  
14 facility at an existing site, it was treated as a license  
15 amendment but a new SAR was prepared for the facility so we  
16 were doing it in a somewhat unusual fashion.

17 We received a prompt review from the NRC and also  
18 the amendment to the license to the NRC. We did that by use  
19 of very skilled staff and in the form and also carefully  
20 following the guidance that we received from the NRC in  
21 order to meet our schedule requirements. Much of that  
22 guidance was in the form of discussions and the requirements  
23 of the regulations were sometimes confusing and somewhat  
24 difficult to follow. This increased our concern over the  
25 timely approval of our application and our schedule was very

1     tight.

2             Had we had a standard review plan and a standard  
3     format and content guide and clear guidances to the safety  
4     analysis requirements and meeting necessary and sufficient  
5     conditions for the application of standards to the facility  
6     design, I would have felt much more confident in having a  
7     degree of control over our amendment application and  
8     response to the questions.

9             As it was, we worked closely with the Staff and  
10    achieved the objective but in a fashion which was subject to  
11    more individual interpretations than I would have preferred.  
12    Currently, my company, SCIETECH, Incorporated, provides  
13    licensing services to applicants including individuals from  
14    the Department of Energy for materials licenses. We are  
15    involved in a number of projects which, I believe, need  
16    clear guidance and the best guidance is succinct, clear  
17    regulations.

18            Many of these projects have a great deal of  
19    uncertainty because of the question, who will regulate them  
20    and to what regulation. One of the reasons for this  
21    uncertainty is the uncertainty of the Part 70 regulation  
22    changes. It is in our interest and that of our clients to  
23    have a single set of regulations for facilities,  
24    particularly for new facilities, regardless of whether they  
25    are built on DOE property or on private property.

1           Based upon these stated reasons and the statements  
2   that I made in November, I am in favor of a comprehensive  
3   change to the Part 70 regulations. I believe the draft is  
4   good. It can be improved with explicitly defining safety  
5   performance criteria and it contains a number of safety  
6   performance criteria and some can be added.

7           I would like the NRC, DOE and current licensees to  
8   work together to finalize the draft regulation. The  
9   requirements of applicants with sufficient quantity of  
10   materials to have a criticality should be significantly  
11   different from those applicants with very small quantities  
12   of nuclear materials.

13           The scope of the integrated safety analysis should  
14   be defined as a part of finalizing the regulation. Also,  
15   the regulation must have a standard format and content guide  
16   and a standard review plan for applicants. Therefore, I  
17   would urge the Commission to pursue alternative five as  
18   outlined by the Staff. However, I also believe that the  
19   current fuel cycle licensees will benefit little from the  
20   new regulations. They have a significant evidence of safety  
21   from their current operations.

22           Therefore, I would urge the Commission to allow a  
23   phase-in period for the current licensees, something like  
24   five to seven years, for them to adhere to the new  
25   regulations. In that manner, I believe they could use their

1 existing staff to prepare their ISA and minimize the cost  
2 impact of the regulatory change.

3 Thank you for the opportunity to speak.

4 CHAIRMAN JACKSON: Thank you very much. I see  
5 people appearing at all times.

6 Let me just ask this question. Are you  
7 Mr. Wooley?

8 MR. WOOLEY: I am Mr. Wooley.

9 CHAIRMAN JACKSON: All right, Mr. Burton, you have  
10 spoken. Mr. Vieth, you have spoken. Is there a Mr. Earl  
11 Carnes here?

12 MR. WOOLEY: No.

13 CHAIRMAN JACKSON: Okay, so, once we hear from  
14 you, there are no other people appearing from the woodwork;  
15 is that correct?

16 MR. WOOLEY: Not that I know of.

17 Good morning, Chairman Jackson, Commissioners  
18 Rogers and Dicus. On behalf of the United States Enrichment  
19 Corporation, I thank you for the opportunity to participate  
20 in this meeting. USEC's chief executive officer, Nick  
21 Timbers, has asked me to give you his regards.

22 My name is Rob Wooley and I am the manager of  
23 nuclear regulatory assurance and policy. My reasons for  
24 wanting to speak to you today are two-fold. First, USEC is  
25 in the process of applying for a certification for gaseous

1 diffusion plants in accordance with 10 CFR Part 76. Our  
2 experience with this process to date has provided some  
3 valuable lessons learned relevant to the Commission's  
4 deliberations on Part 70.

5 Second, passage of the USEC Privatization Act in  
6 April established our proposed AVLIS plant as a Part 70  
7 facility. We intend to apply for a license for AVLIS for  
8 next year. As a result, it is in our interest to  
9 participate in any efforts to improve the Part 70 licensing  
10 process.

11 Our recommendations for the Commission are focused  
12 in these areas: Clarity and defining of the requirements  
13 and detail to be provided in applications filed by new  
14 licensees, adoption of clear performance criteria and  
15 application of new requirements based on cost/benefit  
16 considerations.

17 At a Commission meeting held last March, Dr. Carl  
18 Paperiello made an important point about USEC's application  
19 for certification of its gaseous diffusion plants. He said  
20 that, and I quote, "Had we to do it all over again, I," that  
21 is Dr. Paperiello, "would have provided written expectations  
22 to the U.S. Enrichment Corporation."

23 As reflected in Dr. Paperiello's statement, both  
24 the NRC and the applicant recognized the importance of  
25 establishing clear, unambiguous requirements. Although Part

1 76 was specifically developed for certification of the  
2 operating Paducah and Portsmouth gaseous diffusion plants,  
3 its implementation proved unpredictable.

4 Our original certification application involved  
5 over six months of intense effort and was based on our  
6 understanding of the requirements of 10 CFR 76 supplemented  
7 by established guidance documents used throughout the fuel  
8 cycle industry. After it was rejected, we spent another  
9 four months meeting with the NRC Staff and revising the  
10 application based on those meetings.

11 We have now submitted three revisions and have  
12 answered more than 2,000 questions. Our experience  
13 highlights the lack of predictability in the process. While  
14 certification is unique to the GDPs, our experience is an  
15 example of what could be expected were the draft Part 70  
16 guidance applied to existing licensees. From our  
17 experience, we offer three recommendations for improvement  
18 that should be made in the Part 70 licensing process.

19 One, predictability. New facilities or those  
20 coming under NRC regulation for the first time will enjoy a  
21 more predictable process if NRC first defines what must be  
22 addressed in an application and to what detail. Our first  
23 application was rejected in part because it lacked  
24 sufficient detail.

25 For the process to be predictable, both the



1 applicant and the NRC Staff must work toward a common set of  
2 requirements to a necessary level of detail. Precise  
3 definitions of requirements in a rule coupled with clear  
4 guidance on the level of detail and acceptable methods for  
5 satisfying those requirements will greatly enhance the  
6 predictability of the process. We hope to work with the NRC  
7 to improve the predictability of the AVLIS licensing  
8 process.

9 Two, justify changes. During the certification  
10 process, many of the draft Part 70 requirements were applied  
11 to the GDPs. We are making hardware and software changes at  
12 the two gaseous diffusion plants amounting to approximately  
13 \$150 million. While these changes will unquestionably  
14 improve the margin of safety at the plants, there has been  
15 no systematic examination of the risk reduction associated  
16 with the changes, let alone a determination that these  
17 changes are the most beneficial changes. Both the NRC and  
18 the applicant would be best served by adoption of a  
19 requirement that proposed changes be justified on a risk  
20 reduction basis before imposition.

21 And, third, performance criteria. Evaluation of  
22 changes as well as predictability of the process will be  
23 greatly enhanced by adoption of clear, explicitly defined  
24 safety performance criteria against which the plant is  
25 tested. Such criteria are available for reactors in 10 CFR

1 100. Performance criteria are needed as a basis for  
2 determining whether plant changes are warranted and for the  
3 application of quality assurance measures. Criteria are  
4 needed to better define what constitute an adequate level of  
5 protection of plant employees and the public.

6 We support the industry's recommendation that the  
7 NRC require either a reasonably scoped integrated safety  
8 assessment or an acceptable alternative approach. The  
9 integrated safety assessment proposed by the industry could  
10 serve as the basis for examining the safety benefit of  
11 proposed changes. We would like to be involved in any NRC  
12 discussions to define the methodology, scope and content of  
13 such ISAs as well as the parameters of any alternative  
14 approaches.

15 We are now in the process of performing an ISA  
16 using the draft NUREG-1513 guidance as an integral part of  
17 the current design process for our proposed AVLIS plant.  
18 NRC Staff has expressed an interest in meeting with us to  
19 discuss our approach toward this ISA and we look forward to  
20 cooperating with them in this area.

21 In summary, we encourage the NRC and the industry  
22 to learn from the GDP certification experience and to strive  
23 toward a more predictable process for applying NRC  
24 regulation to new facilities and those coming under NRC  
25 regulation for the first time. In addition, we encourage

1 the NRC to adopt clear safety performance criteria and to  
2 consciously weigh the costs and safety benefits on applying  
3 new requirements to existing facilities.

4 Thank you.

5 CHAIRMAN JACKSON: Thank you.

6 COMMISSIONER ROGERS: Just a question for  
7 Mr. Vieth. In your integrated safety management program, do  
8 you do quantitative safety analysis or are these some kind  
9 of a mixed collection? In other words, how quantitative are  
10 your safety assessments?

11 MR. VIETH: We haven't started this yet. We will  
12 be adopting, for the most part, the concept used by the  
13 Occupational Safety and Health Administration with regard to  
14 the preliminary hazards analysis but there will be  
15 quantitative estimations of the risk to the public and to  
16 the workers from exposures and so on. I expect both  
17 deterministic and probabilistic.

18 COMMISSIONER ROGERS: Thank you.

19 CHAIRMAN JACKSON: Thank you.

20 I think what we are coming out of this with is  
21 clearly an integrated safety approach is the key that  
22 undergirds whatever is done. I think that removing -- and I  
23 think the Commission would agree, that this is the  
24 undergirding -- and removing an overly prescriptive approach  
25 is important. Stability and predictability of regulation is

1 important. Recognition of the differences between existing  
2 facilities and new ones in either regulations themselves or  
3 how they are implemented is important. The quantities of  
4 special nuclear materials are important, that performance  
5 criteria really need to be laid out and cost/benefit  
6 justifications have to exist and that as part of all of this  
7 that a risk-informed approach is very important.

8 So I think I will end as I ended before, which is  
9 the following:

10 First, I think we are moving along the line and we  
11 invite and await any petition that any group would like to  
12 submit that moving along the line of either changes to Part  
13 70 or a new Part 70 is not something that can be unduly  
14 dragged out again. As such, then, it cannot hinge on  
15 detailed negotiations with respect to what an integrated  
16 safety approach is. That is something that has to be worked  
17 out along the way and particularly with respect to  
18 implementation.

19 The final comment is that I would not like to  
20 disabuse the NRC Staff and therefore the industry that would  
21 be subject to this from clarification and of existing  
22 guidance. I think it is important that any clarification  
23 and solidification and consolidation of existing guidance  
24 that can be done should be done but without de facto adding  
25 new regulatory requirements in the process of doing that.

1           I think, Mr. Wooley, your comments speaking from a  
2 comment of Dr. Paperiello's that had there been more  
3 standard guidance in place as to what was required, et  
4 cetera, perhaps in the form of a standard review plan, would  
5 have been helpful, but I think USEC has been the learning  
6 vehicle relative to applying requirements to existing  
7 facilities and I think all of us have come out of that with  
8 a better appreciation for what could be done differently.

9           So, having said that, unless there are other  
10 people in the woodwork, generically described, the meeting  
11 is adjourned.

12           [Whereupon, at 11:56 a.m., the briefing was  
13 concluded.]

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CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON ALTERNATIVES FOR  
REGULATING FUEL CYCLE FACILITIES -  
PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Tuesday, July 2, 1996

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Christopher Gitchell

Reporter: Jon Hundley

**ADDITIONAL DISCUSSION OF  
PART 70 INDUSTRY EXPERIENCE**

**I. Introduction**

One of the principal bases underlying the NRC Staff's prior recommendations for major changes to 10 CFR Part 70 is its assessment of prior fuel cycle industry experience. That assessment was reflected in the Staff's "Regulatory Concerns from Precursor Events at Fuel Cycle Facilities" (Staff Analysis) which was previously provided to the Commission and made publicly available.<sup>1</sup>

The Facility Operations Committee (FOC) of the Nuclear Energy Institute has reviewed the Staff's Analysis. Our basic conclusions are as follows:

- The events evaluated by the Staff highlighted the need for improvements in our operations;
- The safety attitude at the facilities has improved;
- For those events discussed by the Staff which we have specifically analyzed, there were existing, substantial margins of safety and conservatisms that continued to assure public health and safety;

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<sup>1</sup> "Improving the Regulation of Fuel Cycle Facilities" (November 7, 1995), Attachment 3.

- Instances have occurred involving the loss or degradation of a single controlled criticality safety parameter; however, the double contingency principle and conservative assumptions built into criticality safety analyses have operated effectively to prevent an accidental criticality event; and
- Lessons-learned as a result of such events, as well as continuing efforts to make cost-effective improvements in our operations, have provided the industry with an even larger margin of safety than existed several years ago. These improvements, it seems, have gone unrecognized.

The Staff's Analysis was conducted in two phases. Phase I examined eight incidents previously identified by the Staff as "particularly serious or as illustrating factors that cause serious incidents." Staff Analysis at p.1. The second phase examined criticality safety event reports reported under Bulletin 91-01. Staff Analysis at 2.

## **II. Phase I Analysis**

Eight events were reviewed by the Staff and are identified as events A-H in Table 2 of the Staff's Analysis. Two of these events (Events B and C), although significant, occurred at a uranium conversion facility licensed under 10 CFR Part 40, rather than Part 70, and are not addressed in this paper. Five of the remaining six events at Part 70 facilities are discussed below.



### **GE Wilmington (Event A)**

One of the frequently cited bases for the NRC Staff's opinion that new programmatic controls are required is the May 29, 1991 incident at General Electric's Wilmington facility. This incident is often referred to as a "near" or "potential" criticality. Both GE and the industry view this incident as serious. It was not, however, a "near criticality," as the NRC Staff has stated.

To assure criticality safety, licensees utilize the "double contingency" principle from ANSI/ANS-8.1, which states: "Process designs should, in general, incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible."

The circumstances involved in the May 29, 1991 GE incident had been postulated in the licensee's safety analyses. The two parameters controlled to prevent criticality were: (1) mass and (2) concentration. Mass was controlled by sampling and measurement, and concentration was controlled by mixing. In this event, the mass control failed because of problems in the measurement system. However the concentration control remained in effect and was strengthened as soon as the condition was identified.

A criticality event was not imminent. Instead, the controls had degraded to the point that further operation would have been outside the design safety scope and therefore was not appropriate. Recovery action was required. GE immediately initiated this recovery action and reported the situation to the NRC.

Furthermore, in establishing the controlled parameters and their implementation, many parameters and/or characteristics that would prevent or mitigate a criticality event were either conservatively ignored, or considered using very conservative assumptions. For example, GE's analyses assumed full reflection, optimum moderation, and no consideration or boundary for parameters not formally controlled, or which were not

formally characterized in the control scheme. In the case of the system involved in the May 29, 1991 event, at least two such important characteristics were not considered part of the formal safety system even though they had a direct and positive bearing on the safety of the system in question. One was the achievable density of the materials in the system. Studies and tests of these materials during the original evaluations of the system indicated that the potential maximum density was less than the minimum density required for criticality. Further, the impurities in the system were such that they would reduce the reactivity of the system. Considering these parameters, even if both of the two formally controlled parameters were lost (mass and concentration) a criticality could not have occurred.

In any event, the safety system lessons learned were quickly and voluntarily addressed by GE. Regulatory changes were not required, nor were orders by the NRC. Other licensees took the lessons learned, voluntarily evaluated their safety programs, and made changes that were necessary. The operative safety systems were already required by the regulations and the event served to identify lessons learned that would provide a strengthening of the implemented systems. GE and similar licensees made these changes.

#### **Siemens Richland (Events E and H)**

One of the two events that occurred at Siemens Power Corporation's (SPC) Richland facility was labeled as precursor event "E: U Path" (Event E). In this case, which occurred in October 1992, a uranyl fluoride solution overflowed from the top of a hydrolysis tank in one line of the uranium hexafluoride conversion system. During the incident the uranium bearing solution (uranyl fluoride) flowed from the hydrolysis tank vent, through the process off-gas ventilation system ductwork back to the heated vaporization chest which contained a cylinder of uranium hexafluoride under process conditions. The overflow condition was caused by failure of the hydrolysis tank level control system.

Upon discovery of the solution in the vaporization chest, Plant Operations personnel recognized the potential criticality safety significance of the incident and, in accordance with SPC requirements, reported it to the SPC criticality safety staff. The criticality safety staff determined that the overflow condition and accumulation of uranyl fluoride solution in the vaporization chest was an unanalyzed condition of the conversion plant vaporization system criticality safety analysis. The incident was promptly reported to NRC under the provision of NRC Bulletin 91-01, because of the unanalyzed condition. NRC responded to this incident report with a special onsite inspection team, which reported its findings in NRC Inspection Report No. 70-1257/92-08.

Subsequent analysis of the incident by the criticality safety staff under process conditions in place at the time of the incident, confirmed a substantial subcritical safety margin. Additionally, calculations under assumed highly conservative conditions also established that the system would have remained subcritical for any overflow accident scenario.

Moreover, the majority of the criticality safety analyses for the plant routinely include analysis of process upsets in evaluating the subcritical margin under accident conditions, or in establishing the necessary controls and limits for safe operation under upset conditions. The unanalyzed condition was the result of the analyst and independent second party reviewer of the specific analyses failing to recognize the overflow pathway as a credible accident condition.

SPC has since completed a systematic review and update of its criticality safety analyses. This update program included a multi-disciplinary team review of potential process upsets and accident scenarios utilizing techniques described for the integrated safety analysis methodology proposed by the Staff. The SPC Criticality Safety Analysis Update Program also analyzed the process equipment on a logical integrated system basis, rather than individual component basis so that physical and process interactions, in addition to neutronic interactions, were better understood and documented. The use of

multi-disciplinary teams with representatives from Plant Operations and both Plant and Process Engineering also strengthened systems understanding of the criticality safety staff resulting in more rigorous analyses.

The second incident at SPC's Richland facility (Event H) is identified as incident "H: UO<sub>2</sub> Spill". This incident occurred in February 1993 and resulted in the spill of approximately 125 kgs of uranium dioxide powder into the bottom of a contamination control containment hood within the powder preparation/processing equipment system. The spill resulted from the improper disabling of an electromechanical limit switch which had been installed to prevent damage to a mechanical auger used to convey the uranium dioxide powder from a mechanical granulator to the powder vacuum transport system. This equipment is located inside the boundary of the moderation control area. No moderators were present in, nor threatened to enter, the hood in which the powder spill occurred.

The potential criticality safety implications were recognized by Plant Operations personnel who promptly reported the spill to the criticality safety staff, who directed prompt initial recovery actions to clean up the powder spill. The criticality safety staff considered that the spill of more than a minimum critical mass, even though within the confines of a defined moderation control area and outside the confines of the process system piping boundary, was a substantial degradation of a criticality control parameter.

Accordingly, the incident was reported to the NRC in accordance with NRC Bulletin 91-01 requirements. The criticality safety staff also determined that due to other controls in place and the condition of the uranium dioxide powder remaining dry, a criticality accident was not possible.

The NRC responded to this incident with an onsite Augmented Inspection Team (AIT). SPC's internal review results were consistent with the findings of the AIT. The incident was serious because established procedures for the control of the plant configuration were not properly followed in the installation of the limit switch, and

because an operator had violated written company policy when the limit switch was disabled without proper compensatory measures in place. This incident was not caused by the lack of an adequate configuration management control system, but rather a failure to adhere to the existing configuration management system.

In summary, although both incidents (Events E and H), as well as the others described in the NRC paper, are serious in nature and not taken lightly, they are not indicative that the facilities are being operated with little margin against a criticality accident. Nor should it be concluded that these incidents would have been prevented by further regulatory prescription. Review of these incidents demonstrates that in the area of criticality safety, adherence to the double contingency principle on which the criticality safety program is based has resulted in safe facility operation. When the NRC analysis of criticality safety incidents or events refers to these incidents as "Criticality Precursor Events", it should be clearly understood that incident reporting is based on the loss or degradation of only one, of at least two, safety controls.

Based on these two incidents and other incidents within the industry, SPC took a number of initiatives to improve its methodology for conducting criticality safety analyses, to strengthen management control systems and improve the training program to prevent recurrence of past incidents, and to improve the control of plant operations during normal and upset conditions. The effectiveness of these initiatives may be demonstrated by the favorable trend in reduced incidents reported under the provisions of NRC Bulletin 91-01. SPC made its first criticality safety incident report in May 1992. A total of seven incidents or reportable conditions including inadequate safety analyses were reported in 1992. During 1993, SPC made six reports, while in 1994 only two reports were made. In 1995, SPC submitted one Bulletin 91-01 report with none reported thus far in 1996.

### Westinghouse Columbia (Event G)

A process upset which occurred at Westinghouse Electric Corporation's Columbia, South Carolina Fuel Fabrication Facility was identified as "precursor" Event "G: Sampler Plug". This upset, which occurred on May 21, 1993, involved the loss of one of two formally credited nuclear criticality safety barriers associated with the facility's UF<sub>6</sub>-to-UO<sub>2</sub> dry-conversion and UO<sub>2</sub> dry-blending processes. The loss-of-barrier resulted from pluggage of an installed sampling train used for representative sampling of UO<sub>2</sub> powder for moisture analysis prior to its transfer from conversion to blending.

The circumstances surrounding the incident had been pre-postulated in the system's safety evaluation. This evaluation identified two specific, robust barriers against accidental criticality: (1) a barrier of dry-process controls (to prevent/detect conditions leading to formation of a sufficient moderator within the process) and (2) a barrier of moisture detection controls (sampling and verification). It was the second barrier that was lost in the upset -- a barrier that had been instituted to enhance the margin of safety for transporting dry enriched uranium from the relatively small nonfavorable-geometry conversion operation to a relatively large nonfavorable-geometry blending operation.

The nonfavorable geometry dry-conversion process was specifically designed and analyzed for application of a single nuclear criticality safety parameter -- moderation control -- and, as a result, sets of diverse, redundant, criticality-safety-engineered controls were installed to require at least two, independent, concurrent, unlikely changes in normal process conditions before the nonfavorable dry process could be moderated. Diverse-redundant controls were used to assure that only superheated steam was reacted with moderation-controlled UF<sub>6</sub> to produce dry UO<sub>2</sub> in the exothermic (*i.e.*, generates additional heat) UF<sub>6</sub> -to-UO<sub>2</sub>F<sub>2</sub> dry-conversion process, and that only superheated steam was available to the subsequent (integrally linked) UO<sub>2</sub> F<sub>2</sub>-to-UO<sub>2</sub> process. Further,

additional diverse-redundant controls were used to assure that sufficient heat capacity was available to the  $\text{UF}_6$ -to- $\text{UO}_2\text{F}_2$  and  $\text{UO}_2\text{F}_2$ -to- $\text{UO}_2$  reaction chambers to maintain any moderators in a safe, non-condensed state. Thus, this barrier of dry-process controls, by itself, satisfied double contingency requirements through engineered and controlled systems specifically designed to automatically terminate process flows under abnormal operating conditions, well before moderation of enriched uranium in the system could occur.

However, in accordance with Westinghouse-imposed Bulletin 91-01 reporting commitments, the fact that a nuclear criticality safety barrier had been lost (irrespective of the fact that the remaining barrier maintained protection for the involved system) constituted a notification event; and prompt notification of NRC was initiated. Westinghouse voluntarily terminated the operation upon discovery of the event, and identified and implemented corrective actions to reinstate the moisture verification barrier and to restore the design margin of safety. The moisture verification barrier had degraded to the point that continued operation would have been outside operating specifications for the process and was therefore inappropriate. However, throughout the incident, a catastrophic failure of the dry-conversion process would have been required to make accidental criticality possible.

#### **B&W NNFD (Event F)**

Over the last 12 years (since 1984) there have been five occurrences of uranium accumulations in ductwork in the uranium recovery facility. Three accumulations were observed in the 80's:

April 1984	725 grams U-235
December 1986	483 grams U-235
August 1987	465 grams U-235

The only limit available to the NRC for judging the significance of these three occurrences was a 630 gram U-235 limit that had been established for processing operations under mass control. However, this is unrealistic for judging the safety significance of uranium accumulations in ductwork. After the August 1987 occurrence, NNFD performed physics calculations to better understand the safety significance of ductwork accumulations. Calculations were made for the type and configurations of uranium that would be expected and that had actually been observed in the ductwork. These calculations demonstrated that, as expected, significant margins of safety existed for which NNFD had never attempted to take credit. In fact, the ductwork would collapse before accumulating enough uranium to go critical. For example, the critical mass in a 10-inch diameter duct would be 6,200 grams over a 12-inch run of duct. The results of these calculations were presented to the NRC in October, 1987.

NNFD has always recognized the necessity to limit the amount of uranium which might accumulate in the ductwork. Numerous engineered concepts were evaluated to achieve this goal. They ranged from automatic dampers to complex chemical addition systems. Each required careful consideration and testing to assure adequate radiation protection, chemical safety and fire protection. One such system implemented in 1989 was a set of drain tubes to remove condensate from the ductwork before it could solidify. This system proved to be very successful in limiting ductwork accumulations to a trivial quantity. The NRC, in an Inspection Report in 1989 (89-31) concluded that NNFD had made significant improvements in control of unwanted accumulations. NNFD did not, however, establish any new criticality limits for the ductwork since the physics calculation of 1987 demonstrated large safety margins, and since NNFD's efforts were aimed at eliminating accumulations. Thus 630 grams of U-235 remained as a limit on accumulations.



Two accumulations were observed in the 90's:

March 1994	629 grams U-235
March 1995	975 U-235

Because the 630 gram U-235 limit remained, the 975 gram accumulation was reported under Bulletin 91-01 even though NNFD had calculations to support a much higher limit. Following the March 1995 occurrence, NNFD performed an extensive and formal nuclear criticality safety analysis. This analysis not only again confirmed that large safety margins exist, but it established a safety limit of 21,000 grams U-235 for the overall ductwork system. Based on this study, a limiting condition of operation of 2,500 grams U-235 was established for the entire ductwork system which provides a very large safety margin. It should be noted that none of the five occurrences have approached the 2,500 gram limit (let alone the 21,000 gram safety limit). NNFD still maintains the 630 gram U-235 action level to assure that all accumulations are identified and investigated and appropriate corrective actions taken.

NNFD has taken additional steps to assure that all drain tubes remain open and that any blockage will be promptly identified and corrected. Also, a conservative means of correlating the maximum possible accumulation to uranium throughput has been developed and is now continuously tracked by chemical process engineers. Furthermore, frequent inspections have been instituted to identify any possible ductwork accumulation

In summary, NNFD took these occurrences very seriously and instituted prompt corrective actions. At no time, however, was the safety margin seriously degraded even though the highly conservative limit of 630 grams U-235 was exceeded.

### **III. Phase II Analysis**

In Phase II of the Staff's Analysis, it reviewed each of the 64 criticality safety events reported to the NRC under NRC Bulletin 91-01. Forty three (43) were classified into "seriousness" categories. Of those 43, according to the Staff's Analysis, 32 involved the failure of one controlled parameter and in 10 of those, a criticality safety limit also was exceeded.<sup>2</sup> The FOC has not reexamined the facts underlying each of these reported events. We do, however, draw a somewhat different conclusion from the facts as stated in the Staff's Analysis.

A loss or degradation of a controlled criticality parameter is very significant and has been treated so by the industry. However, the double contingency principle recognizes that from time to time one parameter may be lost or degraded. The purpose of double contingency is to assure a continued criticality safety margin, even if such circumstances occur. None of the events reviewed by the Staff involved the loss of two controlled parameters. Furthermore, as is evident in the discussion of several of the events reviewed under Phase I, considerable conservatism and margins of safety are built into the assumptions used in performing criticality safety analyses to reduce even further the likelihood of a criticality event.

SECY 96-079 states that in six of the incidents reviewed by the Staff under Phase II, "one more event, *i.e.* the ingress of water, would have been sufficient to cause a criticality." SECY 96-079, at Attachment 1, p.2. The Staff's Analysis states that "[t]his is strictly a preliminary judgment in the absence of specific criticality analysis of the situation." Analysis at p.21. Furthermore, the Staff's Analysis does not discuss how many additional process upsets would have been required in order for the ingress of water

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<sup>2</sup> The remaining 11 reported events included degradation (as opposed to loss) of one control (5 instances); degradation of criticality alarm (one instance); and "minor or unknown condition, later found OK" (5 instances).

to occur, or the likelihood that such upsets would occur during the limited time the particular criticality control was lost or degraded.

#### **IV. Other Bases for Major Part 70 Changes**

##### **NUREG-1324**

SECY 96-079 notes that NUREG-1324 "Proposed Method for Regulating Major Materials Licensees" (February, 1992) documented findings and recommendations for correcting regulatory deficiencies. SECY 96-079, at p.2. It is important to note that NUREG-1324 documented the results of an effort to propose an "ideal method" for regulating major materials licensees, "unfettered by any existing regulations or regulatory guidance, concerns about backfitting, or limitations on resources . . . ." The Director of NMSS at the time described the regulatory approach offered in NUREG-1324<sup>3</sup> as "admittedly highly idealistic." Furthermore, in Appendix A to NUREG-1324, two senior NRC managers documented their "independent analysis" of the NUREG. They found, among other things, that

"[i]t will require a very substantial increase in resources and take years to complete action on all of the Report's recommendations. Given the characteristics of the facilities at which the Report's regulatory improvements are directed, the reality of agency resource constraints, and the availability of required skills, it is essential to prioritize the Report's recommendations."

NUREG-1324, Appendix A, p. 33.

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<sup>3</sup> Memorandum, Robert L. Bernero to NUREG-1324 recipients.

## **DOE Facilities**

Finally, the NRC Staff has expressed several other reasons for rewriting Part 70. One of those is a desire to improve the “clarity” of the regulations given the “possibility that NRC will be given the responsibility for regulating DOE facilities in the future . . .” SECY 96-079, at Attachment 1, p.4. We do not believe that the “possibility” that the NRC may be asked to regulate DOE facilities provides an appropriate basis for imposing significant new programmatic changes on an entire industry that has operated successfully under the existing requirements. In fact, it seems highly speculative that the NRC could at this stage develop a set of meaningful regulatory changes given the very wide range of facilities, hazards and operations within the DOE complex.

As operators of licensed Part 70 facilities, we firmly believe that our facilities are safe as currently operated and regulated and the NRC Staff has indicated that they agree. There have been very few accidents involving Special Nuclear Material (SNM) at Part 70 licensed sites, and no member of the public has been injured in these rare instances. In addition, there have been no criticality accidents at Part 70 licensed sites. Our excellent record of safe operation results from several factors including the design of our facilities, careful control of facility/process changes, and the maintenance of robust safety programs and management systems. Part 70 licensees have, in response to incidents such as license violations and 91-01 reportable conditions, taken responsible, appropriate action to identify and rectify causes to ensure non-recurrence.



*United States*  
*Nuclear Regulatory Commission*

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**ALTERNATIVES FOR REGULATING THE  
SAFETY OF FUEL CYCLE FACILITIES**

**OFFICE OF NUCLEAR MATERIAL  
SAFETY AND SAFEGUARDS**

**JULY 2, 1996**



*United States  
Nuclear Regulatory Commission*

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**OVERVIEW**

- o Background**
- o Weaknesses with Current Part 70**
- o Evolution of Part 70 Rulemaking**
- o Proposed Alternative Approaches**
- o Summary**



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**BACKGROUND**

- o Past Events**
- o NRC Self-Evaluation of Materials Program**
- o Bulletin 91-01**
- o Action Plan**



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**BACKGROUND (CONT.)**

**o Sequoyah Event**

- 1986 Death from UF<sub>6</sub> Cylinder Rupture**
- NRC's Regulatory Base Criticized as Too Narrowly Focused**

**o GE Event**

- May 1991 Potential Criticality Event**
- Facility Operational Deficiencies Identified**
- Adequacy of Regulatory Base Questioned**





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**BACKGROUND (CONT.)**

- o NRC Self-Evaluation of Materials Program**
  - Task Force Created to Review Program**
  - Program Weaknesses Identified in NUREG-1324 - 1992**
  - Regulatory Program Criticized**



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**BACKGROUND (CONT.)**

**o Bulletin 91-01**

- Required Reporting of Loss of Criticality Controls to NRC**
- Considered Precursor Incidents**
- Analysis Indicates that Deficiencies not Isolated**



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**BACKGROUND (CONT.)**

**o Action Plan**

- Developed to Correct Deficiencies by Inspecting Safety into Program**
- Initial Plan Rejected by Commission with Direction to First Upgrade  
and Clearly Define Regulatory Base**
- New Action Plan Focused on Improving Regulatory Base**



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**WEAKNESSES WITH CURRENT PART 70**

- o Not Risk-Informed - Integrated Safety Analysis Not Required**
- o Silent on Important Safety Areas**
- o Systematic Safety Analysis of Process Changes Not Required**
- o Only Criticality Reported to NRC**
- o Not User-Friendly and Difficult to Administer**



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**EVOLUTION OF PART 70 RULEMAKING**

- o Draft Rulemaking Package Developed (June 1993-March 1995)**
- o Commission Directed Staff to Discuss with Interested Parties (March 1995)**
- o Two Public Workshops Conducted (May & November 1995)**
- o Commission Provided Alternatives (April 1996)**



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**PROPOSED ALTERNATIVE APPROACHES**

- o Alternative 1 - No Change to Part 70/Cease Encouragement of ISA**
- o Alternative 2 - No change to Part 70/Continue Encouragement of ISA**
- o Alternative 3 - Amend Part 70 to Require ISA**
- o Alternative 4 - Amend Part 70 to Require ISA and Correct Other Weaknesses**
- o Alternative 5 - Create New Risk-Informed, User-Friendly Part 70 Based on ISA**
- o Alternative 6 - Modify Part 70 (Alt. 3, 4, or 5) and Grandfather Current Licensed Programs from ISA**



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**DISADVANTAGES OF CONTINUING WITH CURRENT  
REGULATORY PRACTICE  
(ALTERNATIVE 2)**

- o Current Regulation Does Not Explicitly Address:**
  - Performance of an ISA**
  - Criticality Prevention, Chemical Process Safety, and Fire Protection**
  - Protection Against External Events, Except Pu Facilities**
- o Reliance on Voluntary ISA Commitment Not Effective or Efficient Way to Regulate**



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**DISADVANTAGES OF CONTINUING WITH CURRENT  
REGULATORY PRACTICE  
(ALTERNATIVE 2) (CONT.)**

- o ISAs Performed on Voluntary Basis May Vary Widely and May Not:**
  - Consider Accidents Involving Chemicals and Fire**
  - Be Used to Assess Impacts of Proposed Operational Changes**
  - Be Thorough**
  - Be Completed Expeditiously or Kept Up-to-Date**





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**SUMMARY**

- o Regulatory Weaknesses Identified**
- o Input of Interested Parties Considered**
- o Six Alternatives Developed**
- o Upgraded Regulatory Base Important for Licensing New Facilities**

**PRESENTATION BY**  
**NUCLEAR ENERGY INSTITUTE**  
**BEFORE THE**  
**U.S. NUCLEAR REGULATORY COMMISSION**  
**July 2, 1996**

# **SUMMARY OF INDUSTRY RECOMMENDATIONS**

- **Adopt focused performance-based addition to existing Part 70**
- **Rule would require ISA or alternative**
- **Rule would include:**
  - **Measurable safety performance objectives**
  - **Reference to industry approaches**
  - **Principle that licensees use graded approach based on ISA results**

# **SUMMARY OF INDUSTRY RECOMMENDATIONS**

- **Cooperative NRC/Industry effort to establish details of ISA (NUREG-1513) and alternatives**
- **Suspend work on draft rule/SRP/Standard Format & Content Guide**
- **Programmatic changes are premature**
- **Finalize addition to existing rule after consensus on guidelines for ISA and alternatives**
- **ISA documentation maintained by licensee and available for NRC review**

# **SAFETY PERFORMANCE OBJECTIVES**

- **Rule should contain well-defined, measurable safety performance objectives**
- **“Consequences of concern” are generally reasonable**

# **GRADED APPROACH**

- **ISA results used to grade safety program implementation**
- **Evaluate and document controls needed to prevent/mitigate consequences of concern**

# **REFERENCE TO INDUSTRY PRACTICES**

- **Reference AIChE (1992) and other acceptable industry practices**
- **Acknowledge acceptability of OSHA/EPA hazards analyses**

# **ALTERNATIVE APPROACHES**

- **Flexibility to consider alternatives to ISA**
- **NRC and Industry approved**



# **OPERATIONAL CHANGES**

- **Determined by licensees based on ISA or alternative**
- **Programmatic changes in NRC draft rule and guidance documents premature**
- **Assessment of prior industry events has led to improved margins of safety**

# ISA DOCUMENTATION

- **ISA results documented**
- **ISA results available for review**
- **Significant plant change would require review/update of ISA**

# **BACKFIT PROVISION**

- **Analysis of regulatory changes required**
- **Cost-benefit justification for safety enhancements**
- **As provided in Parts 50 and 76**

# RECOMMENDATIONS

- **Staff/Industry to work out ISA particulars**
- **Limited addition to existing Part 70 to incorporate ISA requirement**