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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: Thursday, November 1, 1990

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON PLANT OPERATION

"Reconstitution of Design Basis Documentation"

Thursday, November 1, 1990

Nuclear Regulatory Commission

Conference Room P-110

7920 Norfolk Avenue

Bethesda, Maryland

The Subcommittee met, pursuant to notice, at 1:20 o'clock, p.m., where present were:

J. Carroll, ACRS Subcommittee Chairman

C. Michelson, ACRS Member

P. Shewmon, ACRS Member

PRESENT, CONTINUED:

E. Wilkins, ACRS Member

P. Boehnert, Cognizant ACRS Staff Member

E. Imbro, NRR/NRC

G. Grimes, NRR/NRC

T. Pietrangelo, NUMARC

A. Marion, NUMARC

PROCEEDINGS

[1:20 p.m.]

MR. CARROLL: Good afternoon. The meeting will now come to order. This is a meeting of the Advisory Committee on Reactor Safeguards, Subcommittee on Plant Operations. I am J. Carroll, Subcommittee Chairman. The ACRS members in attendance are Carl Michelson -- or will be -- Paul Shewmon and Ernest Wilkins.

The purpose of today's meeting is to be briefed by the NRC and NUMARC on their efforts concerning Reconstitution of Design Basis Documentation for Nuclear Power Plants. Paul Boehnert is the cognizant ACRS staff member for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on October 17, 1990. A transcript of the meeting is being kept and will be made available as stated in the Federal Register Notice.

It is requested that each speaker first identify himself or herself and speak with sufficient clarity and volume into a microphone so that he or she can be readily heard. We have received no written comments or requests to make oral statements from members of the public.

Do any of the Subcommittee members have anything they'd like to discuss at this point?

[No response.]

MR. CARROLL: Okay, we'll then proceed with the meeting, and I'll call on the staff to begin.

MR. IMBRO: I'm Gene Imbro, Section Chief in the Special Inspection Branch.

MR. CARROLL: Who are you?

MR. GRIMES: He's going to make the presentation. Let me introduce myself; I'm Brian Grimes, Reactor Inspection Safeguards Division.

[Slide.]

MR. IMBRO: I am Gene Imbro with NRR in the Special Inspection Branch. I'd like to talk to you today about the Reconstitution of Design Bases and Design Documents. The subjects I'm going to cover today are first of all, trying to define what design documents are, go through a little bit of the NRC efforts we've gone through to put together a NUREG, provide some observations on utility programs and also to give you some of the observations on some of those utility programs that we've seen.

MR. CARROLL: Brian and Gene, this is strictly a briefing to us? You're not expecting a letter or a formal comment necessarily?

MR. GRIMES: That is correct. It's just a briefing to update you on what we're doing at present in

this area.

[Slide.]

MR. IMBRO: Just to go through quickly what prompted the utility efforts in reconstitution of design bases, NRC has been conducting team inspections probably for the last five years since 1984 or 1985. Those have been basically safety system functional inspections and safety system outage modificatior inspections.

There's kind of a common thread that goes through all of these inspections. When we look at the facility design, particularly of older facilities, many of the design documents are not available to support facility modifications.

As a result of the inspections we've conducted, utilities really became cognizant of the fact that this was, in fact, a problem and they, on their own, have initiated design document reconstitution programs.

MR. SHEWMON: Actually, in the case of the pressure vessel and welds, often they don't have samples from the way it was done originally, much less the modifications. Is that also a part of the program?

MR. IMBRO: Well, we didn't look at that level of detail, but that's true in general. In a lot of cases, not only is the documentation to support modifications not available, but also, many of the findings we have go back to

the original design and, in fact, there's a lack of original design material.

[Slide.]

MR. IMBRO: We started to talk about design basis documentation and we found out that there were a lot of different definitions of design basis documentation. People perceived things differently.

Of course, when we talked about missing design basis documentation, we were really referring to not only the design bases and design criteria, but also the calculations that show how the design basis is implemented and the design output documents. Some utilities perceive the term design basis documentation, to mean just the design criteria, so some utilities focused on, in the design document constitution programs, focused on strictly regeneration of criteria.

What was used as design input for the plant? So, when we talk about design documents -- we basically use the term design documents to kind of make it more sweeping, that we don't only mean design bases but we mean all the design documents.

[Slide.]

MR. IMBRO: The design documents kind of fall into three different categories which are fairly obvious. The first category is what people would refer to as design input

documents and you know, they are the RC regulations, guidance presented by the Standard Review Plan and Reg Guides, industry standards, design procedures and the like. Certainly, the vendor specified data, vendor performance requirements are also a design input.

Then, I guess, skipping across, the final design output documents would be the things that are used to procure equipment and construct the facility. You're talking about things like drawings, purchase specs, setpoint lists, valve lists and the like.

The bridge between those two is really the design analyses, what translates the design input to the design output.

MR. MICHELSON: Gene, there seems to be one step missing in that slide. Maybe it's in there and I just don't see it, but admittedly, there are a large number of requirements and regulations which we call here design input documents. The key element, though, in getting on to doing design analyses and producing output is to interpret the input documents.

That interpretation step is extremely important so that you know how the designer interpreted the regulations; in other words, what did he think they were saying and therefore, what he's going to provide.

Where is that interpretation step in your process?

That's got to be documented. It's very important to know how the person interpreted the regulation.

MR. IMBRO: It's really the transition from here to here. It's not really defined per se.

MR. MICHELSON: The hardest thing to find lately. Sometimes it's there. A lot of things don't have system descriptions. System description doesn't fit a lot of the situations, a lot of calculations and evaluations. They don't fit the system description idea, but there has to be some kind of a transition document which is really your design basis as you interpreted it from the regulations and all the other things.

MR. GRIMES: The calculations and evaluations have to indicate what their input is and what their assumption are.

MR. IMBRO: I would put that in this box, Design Procedures. That's how the AE's or whoever is designing, interprets all these documents and implements them.

MR. MICHELSON: That's the difficult information to recover later; is, okay, I know what the regulations said then and here's what they did, but something happened in between. How did that individual go astray or how did he interpret the regulations incorrectly.

He might have had quite good logic on what he did. It's just not documented and we never know later. I guess

it's not possible to recover, but in the future, it ought to be a part of your requirements.

MR. CARROLL: I guess I would view what you are describing as part of the evaluation.

MR. MICHELSON: In a way, yes, but you have to make a lot of assumptions.

MR. GRIMES: I think one thing that will come out later, when Gene describes the survey results, is that everybody had a different design configuration process, and everyone has a different set of documents and a document logic to go with that. So, we have shied away from specifying specific documents, but we expect certain things to be accomplished.

MR. MICHELSON: I expect you should be able to find somewhere what are the interpretations of the regulations. It's different than assumptions. It is the interpretation of a regulation.

[Slide.]

MR. IMBRO: Your point is well-taken, and many times, in doing inspections, or particularly when we were doing IDVPs or looking at IDVPs for reactors that were about to be licensed, you'd have different AEs conflicting over -- in our company, we interpret the code to mean this, and another AE says, no. So, you raise a valid point.

I just wanted to talk a little bit about

regulatory design bases and engineering design bases, and this is kind of a little bit of a sticky thing, I guess, but the regulatory design basis, I think we're being consistent with what's termed current licensing bases for life extension, but for a regulatory design bases, we mean basically the documents that were looked at by the staff to form their safety judgments on the licensing documents for the plant.

So, you have, again, regs, tech specs, the SER, all the licensing commitments, and actually, there is a definition of design bases in 50.2. The engineering design bases is really a lot broader set of information and criteria.

It includes, certainly, the regulatory design bases, but it also includes a lot of other things that the staff may or may not consider, because they're not really directly safety-related, and in a lot of cases, the non-safety-related functions sometimes are the determining factor for the size of the safety-related equipment. So, the engineering design basis is a little bit broader.

Also, it includes so-called good practice documents and standards. So, the engineering design basis is pretty much all-encompassing, and that will be kind of what an architect or a designer would use as the total design input.

[Slide.]

MR. IMBRO: Just quickly, to go through why design documents are necessary, certainly, as the slide indicates, you really need to have documentation available to support plant modifications, and in the case of a new plant, certainly if the original documentation is not there to document the design, then certainly it's hard to modify the plant if you don't know where you're starting from.

In the same vein, the documents really help you in making a plant modification, to help you quantify design margins and design envelope, operating envelope, and certainly, it's basically the record of the as-configured plant.

[Slide.]

MR. IMBRO: What we did as a staff is we had been aware of many utilities going out and spending, in some cases, substantial sums of money to recreate design documents, and we decided that it would be appropriate for us to go and look and see, more or less, what their process was and to try and understand, give us a handle on what the status of the industry was in terms of design documentation, how much was really available, how good or bad was the situation in terms of document availability.

So, we visited six licensees, and we talked to one NSSS vendor, General Electric, and we looked at the

availability of design documents. We also looked even further. We looked at how utilities control their design and how they made modifications to the plant and how the utility groups interface with each other, and for some utilities, of the ones we visited, that had design documentation programs, we tried to gain an insight into what they were doing and what their approach was.

[Slide.]

MR. IMBRO: As a result of our limited survey --

MR. CARROLL: Which utilities were those?

MR. IMBRO: In the next slide, I will get to that, if you'll bear with me for just a minute.

Basically, we intend to put out -- issue a NUREG, which has kind of been a long time in the making, but it should be out, hopefully, before the end of the year, and the NUREG is going to -- will be a good practice NUREG.

It will talk to the following areas: what design documents we think should be controlled and should be maintained as configured; if design documents need to be reconstituted, if you find, when you do your survey, do your design documentation program that design documents are missing, which ones do you need to regenerate and which ones, maybe, do we not have to regenerate.

Also, we like to give some insights into the strengths and weaknesses of some of the utility-initiated

design reconstitution programs and talk a little bit about configuration management. The thing is, though, that each licensee really has given us a different perspective that we have gone to see, and certainly, each licensee has their own particular needs.

So, it's really hard to -- there is not one program that will suit everybody. Each utility really needs to do their own thing, as it were, because they have different organizations and they have different needs.

[Slide.]

MR. IMBRO: For the licensees that were surveyed, we tried to take a mix of new and old plants, and so, we went through Robinson, which is certainly old, or older, Susquehanna and Diablo Canyon, which are fairly new. Fort Calhoun is an old-generation plant, as is Crystal River and Turkey Point.

So, we tried to get kind of a cross-section of what different people were doing and what the different status of design documents was.

Yes?

MR. SHEWMON: Crystal River is Combustion, and Turkey Point is Westinghouse?

MR. IMBRO: Turkey Point is Westinghouse. Crystal River is B&W.

MR. GRIMES: Fort Calhoun is CE.

MR. IMBRO: It's Westinghouse, BWR, GE, Westinghouse, CE, B&W, Westinghouse.

MR. CARROLL: Now, of those six utilities, only PG&E has historically done its own engineering and construction management.

MR. IMBRO: That's right. It's kind of interesting, because older utilities, at least at that time, the time of the survey, which is probably about a year and a half ago, older utilities didn't really see the need to do DBDs.

The utilities that had newer plants, like PP&L and Diablo Canyon, really didn't see the need to do them at that time. PG&E had something that was kind of like a DBD, but it wasn't -- but the purpose was more to provide the operation staff with an insight into the design, rather than a document to be used by designers, because they felt that they had adequate documentation and they really didn't need a design document reconstitution program, primarily, as you say, because they were their own AE.

From an NRC point of view, we don't really -- we haven't really forced people to do design document reconstitution programs. However, we do require that they have adequate design documentation. So, whatever it takes to get there.

MR. SHEWMON: I guess I am trying to -- I'd like

to back you up about two steps, I guess. The reason you're doing this is that for plant life extension, you have to know what the design basis is. Is that right?

MR. IMBRO: That's probably true, but that's not really the reason we started.

MR. GRIMES: That may be a side benefit, but the reason we started was, starting with the Davis-Besse event, we realized there were a lot of problems in functionality of safety systems that related directly back to engineering and the control of engineering, and so, we started doing safety system functional inspections and outage modification inspections. Those gave us a lot of results where there were clearly safety systems that would not have responded in the event of a challenge.

Utilities recognized the validity of those findings and began on their own looking into the root cause of that, which both we and they agreed, in many cases, was a lack of good configuration control in their design process and a lack of access to documents, so that the engineers doing modifications to the plant could really know why the system was configured the way it was and take that into account.

MR. MICHELSON: -- design basis for the motor operated valves so they had incorrectly adjusted them in some cases.

MR. GRIMES: That's right.

[Slide.]

MR. IMBRO: I guess what we're expecting in terms of level of design documentation -- I guess expecting utilities to have -- is, first of all, we've got to define the term "essential design documents" and essential design documents, we feel, is those documents that are used frequently by the operating staff during normal plant operation and to respond to events and also documents that are used by the engineering -- by engineering -- to support plant operation and, you know, some of those things would -- naturally, we would expect utilities to have up to date P & IDs and single lines and schematics.

And from the engineering side they would need to have as an essential document those documents that support tech spec values and that type of thing.

So, as a minimum, we'd like to see utilities to have essential design documents and also then if they go ahead and decide to modify a system they certainly should recreate whatever documentation they need to form the basis of the modification. And you have to regenerate whatever you need to do that.

[Slide.]

MR. IMBRO: We felt that for some of the older plants it's rather unreasonable to ask them to go back and

regenerate design documentation that maybe was done 20 or 25 years ago and was lost over the years. To ask some utilities, particularly that have older vintage plants to do that, I mean, is asking them to spend probably hundreds of millions of dollars. And in a lot of cases it's not necessary. So we tried to have a balance.

We found that where we found the most problems and particularly with some of the plants -- TVA plants -- was that utilities tend to get in the most trouble when the engineering group doesn't have the design authority. It doesn't control the plant design.

When operations really drives the design and controls the plant design bases it's probably more likely when you're going to see things go amuck. People have different focuses.

So we certainly advocate strong engineering organizations that control the design bases.

[Slide.]

To get to survey observations for the design reconstitution programs that we saw, I guess we were able to draw the following conclusions -- observations.

We feel that, although all utilities may not need design document reconstitution programs, all should evaluate whether or not they need to embark on such a program. They should look at the design documentation they have now, look

at the staff turnover. Are a lot of senior people still there or are a lot of senior people planning to retire? Are they going to lose all this wealth of information shortly?

How easy is it to make modifications? In some cases, you go and talk to utility and they'll tell you that half the engineering hours spent in doing a modification is trying to retrieve the documents.

And so people really need to do some self-evaluation to decide whether or not they need to do a program. And if they do, they should do it.

Not surprising, the need for a DBD program is proportional to the facility age. Documents tend to get lost over the years. Either that or else they're not maintained. They're not kept up to date.

Again, design documentation programs should meet the unique utility needs because everyone really operates differently. So in doing self-evaluation I think it's important that utilities decide what exactly they want from a DDR program before they start and then craft the program to that model.

One thing we felt that was also particularly important was utility staff involvement in design documentation review programs.

It would seem like some of these utilities are spending 20, 40, $60 million, and if you're going to have

all that done by contractors it seems like there's a lot of wealth of information that's kind of then retained in the minds of the people that are doing it. It would seem like to have your own staff involved in that would be certainly beneficial, first of all to get them smart as to how the plant was designed. And, certainly, you would retain -- be able to retain that inhouse. But also it gives your staff more of a sense of ownership for the system.

So I think it's important if a utility embarks on a DDR program they shouldn't just turn it over to a contractor and say, hey, produce me a set of design bases documents. They should really work with the people.

As I mentioned before, stronger inhouse capabilities are needed, too, I think -- and not all utilities. I mean, the larger utilities have pretty large engineering staffs.

Some of the small ones, though, rely heavily on outside contractors to do plant modifications. And certainly there's nothing wrong with contractors doing modifications. I mean, they certainly do a good job, but it would seem like for the utility to really understand their plant and to retain ownership of the design so to speak they should at least have enough inhouse capability to ask intelligent questions about how the plant is being modified. I mean, after all, they own it. They operate it. And so

they should understand it.

MR. WILKINS: Let me ask a question in that regard. There's a modification that they want to turn over to a contractor. Who originates the modification? The utility?

MR. IMBRO: The utility would. Sure.

MR. WILKINS: Yeah. Of course. So somebody in the utility must have had some reason to think that the modification was desirable.

MR. IMBRO: Oh, it's not a question of desirable but it's how it's implemented. You know, did the designer do the right thing? Did they ask the right questions? Did they do the right analyses? Did they use the right criteria?

MR. WILKINS: And why did they do it this way instead of that way?

MR. IMBRO: Right. Don't just go out and order it and say, look, I want it. And then put it in and then just stand back and kind of walk away from it.

To my mind people should be involved. At least should be smart enough to ask the right questions. I mean, they might not have to know how to do all the work because a lot of distress analysis and thermohydraulics analysis is pretty arcane and maybe very few people know how to do them and all the ins and outs. But I guess it's my feeling that

utilities should at least have staff that's sufficiently up to speed on those to ask the right questions as to what's being done.

Also, with DBDs if you go through all the trouble of -- and expense of -- the developing of a set of design bases documents, then you certainly should keep them updated and maintain them as built with the plant.

And I guess, obviously, one of the other benefits is they would cut down on all that time spent during the modification process of trying to retrieve documents.

[Slide.]

MR. IMBRO: We are advocating the utilities use -- it's a suggestion -- kind of a template approach in sitting down and developing DBDs. What I mean by a template approach is it's hard to know what's missing unless you know really what you're looking for, so before people or utilities go out and develop a D3D program or develop a DBD, they should first ask themselves the question of, Well, what information do I really need to have to assure that system is going to perform its function, and what parameters do I need to know, and what ranges of the parameters are acceptable?

Once you have that in hand, then you can go through the boxes of documentation, and after you finish, you know what you have and what you need, and whether or not

you need to reconstitute it.

Again, some utilities, we found, tended to do this, just reconstitute design bases, but we also feel that, in some instances, they really should give some consideration and regenerate supporting calculations. That's what we found before.

Another thing we found was that in some instances, there was no defined prioritization program to regenerate missing documents. Again, we're not saying that you need to regenerate everything, but at least you need to decide what has to be regenerated, and then also then put it into some prioritization scheme.

Some utilities were pretty sophisticated, and they are using a PRA approach to determine the safety significance of the missing information, and they use that to prioritize whether or not missing documents or what scheduled documents need to be regenerated.

Others used kind of more of an engineering judgment type of approach, and some other utilities just put them aside and said, Well, I know this is missing. I guess I'll regenerate it when I finish the program, or that type of thing. But we obviously don't think the last approach is very good, and people should think up front about how quickly the need to regenerate some of these missing documents.

I talked about essential documents before. I won't go through that again.

One thing we really think is very important is that utilities need to do a field validation of DBDs. Once you spend all the money to finally figure out what your design bases really are, then you should go out in the plant and say, Okay, now that I know what my criteria are, does the plant still need them? After 20 years of modifications, do I still need my design bases? So we think that just creating shelves of paper doesn't really do you a whole lot of good unless you go out and make sure that the plant really does meet what you think it should.

Also kind of in the same vein, we've noticed that in looking through design documentation that was available, people would kind of take a calculation at face value and not really verify whether or not it was still valid or still accurate. People would just kind of tend to say, Well, I have a calculation for NPSH for the safety injection pump. That's okay. Check the box and go on.

We feel that, certainly for the CALCs that have gone through the Appendix B independent review, that you don't really need to do a detailed technical review to verify what's already been done before, but certainly, if you give it a sanity check, and say, Hey, does it still match the plant if the calc was done 25 years ago? Is the

calc still valid? Are the assumptions still reasonable? That type of thing.

[Slide.]

MR. IMBRO: As a final slide, operability and reportability was really a major concern of utilities we spoke with, and there was always the question of, If I don't have documentation to justify a system design, is it operable? Do I need to report it?

There were a lot of cases in the beginning where people were cycling their facilities pretty regularly because they didn't have design documentation available. They'd almost begin kind of a shutdown process until they were able to recreate the design documentation or determine whether it was a problem.

I don't want to get into a whole lot of detail on this, but the staff now is putting out guidelines on operability, operability determinations, and pretty much, the nuts and bolts of it is you really need to look at the safety significance of the information that's missing, and you need to make a judgment as to whether or not you think that the information is going to cause you a problem or not, or the fact that it's missing. Do you think the outcome is going to be okay when you regenerate the information?

MR. SHEWMON: You said three sentences ago that they were cycling up and down, or this is --

MR. IMBRO: In some cases they were, yes.

MR. SHEWMON: Could you give me an example of what would cause cycling and tell me what the period of these cycles are? Are we talking about quarters or weeks?

MR. IMBRO: I mean, it's not cycles in that term. What I meant was that, you know, if they found a piece of design documentation missing, the plant might be in an orderly shutdown. In some cases, I think they may have shut down plant until --

MR. SHEWMON: It was safe yesterday when they were ignorant, but today, we're smarter, so we have to shut the plant down. Is that it?

MR. IMBRO: Oh, we didn't say that was a good idea, but people were kind of confused and said, Hey -- you know, they didn't really know what to do. They knew that there was documentation missing. They didn't know if the plant was safe or not safe, and I guess they said, Well, if I don't have the documentation, I'll just declare a system inoperable and follow my tech specs as kind of the safe -- you know, what they perceived was the safe thing to do.

But you're right. I mean, the plant's been operating for 20 years. The fact that you don't have a piece of paper doesn't necessarily make the system inoperable when it's been working fine for all these years.

That's why it's kind of a good lead into the

premise of operability. We basically are saying that the fact that the documentation is missing doesn't necessarily mean the system is inoperable.

You can presume the system is still operable, I mean, providing you have some engineering basis to do so. Not necessarily documentation, but use reasonable engineering judgment, maybe look at test data, surveillance data, start-up test data, whatever else you can, and if you can reasonable conclude that the fact that the documentation is missing doesn't really cause a problem, and you have a high level of confidence that the system is designed okay, then, you know, just keep on going.

Also, the question is -- the point is that the decision process needs to be kind of continuous. I mean, as you discover new information, then you really need to re-evaluate whether or not your original decision was correct. So it's kind of an iterive type thing.

Reportability. Basically there is no change in the reporting requirements. If you find you are operating outside of your design basis, then you need to report it by 50.72 or 50.73; whatever is appropriate.

One thing we -- and NUMARC probably will talk about this a little bit later, I suppose. In the -- let me talk a little bit about the NUMARC guidelines. NUMARC has put out a design -- I guess you have a copy of it -- their

program -- design basis program guidelines. We've participated with them over the last year, year and a half I guess in developing it.

They've been very responsive to the staff comments -- have incorporated a lot of the staff comments and are in the process of putting out a letter basically saying that the NUMARC guidelines form a useful basis for people to use the craft or DBD program and also provide some -- some reasonably good insights into -- into the DBD process. We think it is a worthwhile document and a lot of what I'm saying here is also -- is contained in the NUMARC document and they -- they and the staff were in agreement on the position.

To get back what I was saying. One of the things NUMARC proposes and other utilities have proposed in some meetings with NRC is that rather than -- if you're going to file an LER, rather than developing a corrective action for each LER, which you may do anyway; but what you should do is then wait until you've finished the DBD and look at all the LDR's again in total and see whether or not there's something that falls out of -- out of the combined picture and maybe that -- maybe that will identify additional corrective actions that are needed.

So, those kind of -- then take -- after you've done -- looked at the original findings, it's time to step

back and look at what it means in total.

NRC's enforcement policy has been changed once to basically encourage utility initiator programs. Certainly utilities were concerned with the fact that if you spent millions of dollars, then would the staff then turn it against them and say, hey, but you operated outside of your design basis and then possibly be cause for a violation or civil penalty.

I think the enforcement policy was changed once to -- to reflect the fact that if you -- if you do find a situation that would be a violation; I believe it's for anything Level 3 or less, that the staff would waive the civil penalty, but issue the violation. I think presently under consideration in enforcement policy is another change that's yet to be promoted in which the staff is considering then not only eliminating the civil penalty, but then also to not even site or give a violation. That's something that's being considered by the staff now.

So, that basically concludes my part of the presentation. Any comments, questions?

MR. CARROLL: Do you have any plans to expand all this good advice to somebody starting with a clean sheet of paper on a certified design, or on a certified plant?

MR. IMBRO: Well, I mean, certainly, as we discussed yesterday, we think that design bases and system

descriptions and that type of information should be properly certified. Even as I discussed before -- even some of the newer plants that we visited or even people that we didn't visit, have decided that they really need a design document for a reconstitution program because they feel that -- they see the mistakes that have been historically made. They don't want to repeat those; they don't want to get into a position 10 years from now where they don't have design documentation.

MR. CARROLL: Yes, and if you do it right from day 1, the other thing you can do is -- is develop the database or a very sophisticated computer-based information management system so you can really find things in a hurry. You want to know how many of this kind of relay and where they are is and that sort of thing.

MR. IMBRO: Yes. We've seen some at some of the plants we visited. I think Crystal River had a -- it seemed like they had a pretty good system. I forget what they call it -- Configuration Retrieval Information System or something like that. But they had all plant information on optical disks. You could go in by part number and pull out everything you ever wanted to know about a particular valve. I guess you could sort it probably any which way you wanted. So, yes, I think a lot of people are developing that capability. But, you're right. It's easy to start with it

up front and as you proceed with the design, to put the information into the system.

MR. SHEWMON: To pick a utility at random, did PG&E have something like that?

MR. CARROLL: Yes, we do, but it -- it -- it cost me $7.5 million to reconstitute the component database or to put a decent component database together for our PIMS System. We literally had to go out and look at the 70,000 components on each unit to make sure we knew what we had there for starters. That's why I'm sensitive to -- if you really set up a program with that kind of end in mind at the beginning of a design, you'd sure be miles ahead.

MR. SHEWMON: Yes, it does sort of bring up the question of -- I guess you brought up, future plants before and if somebody does have an outside AE do their work for them, what kind of a package do they get delivered, or where do the records -- what sort of a package -- what sort of paperwork package do they get delivered and will it be any different in the future than it has been in the past after you've got done doing what you're doing now and what NUMARC is going to tell us about?

MR. IMBRO: We would hope so certainly, but in fact, some of the things we've seen in the past is that -- you know, it's all kind of a contractual thing, where you'd go to a utility and ask to see certain calculations and

design documentation and they'll tell you, well, we never got it from the AE because the AE was never -- it wasn't part of our contract to get the calculations. We bought a plant, we didn't buy the design so to speak.

MR. SHEWMON: You don't think its existence should be part of the regulations; you see no basis for that?

MR. IMBRO: Well, I'm not saying, I don't know whether it should be part of the regulations -- I'm not disagreeing that it's a good idea. Whether we'd push it that far --

MR. SHEWMON: Well, I'm asking --

MR. GRIMES: Well, we have certain requirements for knowledge of design control when you make modifications now. I guess our focus is mainly when you -- when you modify the plant you have to establish that you know what you're working with before you modify it. As time goes on, we expect to see, even without these programs, better and better design documents as you work on different parts of the plan.

MR. SHEWMON: That is a regulation that you have to know what the design basis was before you should -- before you modify it?

MR. GRIMES: Yes. You have to know whether you're decreasing design margins to know whether you need NRC approval.

MR. IMBRO: That's right. I mean, that type of thing is contained in 50.59. But also, even in Appendix B, criterion 3 on design control basically requires that you have a documented design basis. I mean, we feel that there are enough -- that the regulations are really in place, it's just a question of not being implemented properly.

MR. GRIMES: Everyone is committed to N45.2.11.

MR. IMBRO: 2.11, right.

MR. SHEWMON: What you think is a nice idea may or may not cut in the water, what's in the regulations does.

MR. IMBRO: That's right. I think pretty much it is covered in the regulations. It's just a question of the implementation.

MR. SHEWMON: To bring in an irrelevant comment Machiavelli one time said: "A prince can rule by love or by fear, fear never fails."

MR. CARROLL: Yes, he did say that.

MR. WILKINS: Do you have any feel for whether the utility could write a contract with an AE that would provide for the AE to deliver this documentation, and if so, what increase in cost? I don't mean in absolute dollars, but say relatively speaking. Just give me a feel -- is it 1 percent of 10 percent, or 50 percent?

MR. IMBRO: I don't know. I couldn't really put a handle on it, even in percentage. Certainly, if you have

enough money you could buy anything.

MR. GRIMES: I think, in the current situation, when you have a bidding process and competition for modifications, that if you make that a condition of the contract, I think people are fairly amenable to doing that. If you go back and say I want to now buy from either the NSSS or the AE documentation that was -- that's someplace in their files, that hasn't been controlled over the last 20 years and you ask them to dig it out and provide it to you with some assurance that it's -- it represents the plant, then they're going to charge you an arm and a let for that, and some utilities are going through that process.

MR. IMBRO: One of the reasons we went to General Electric as a NSSS vendor -- I just kind of picked at random among the 3 was that when we had gone to the utilities, many of the utilities were really somewhat complaining that, gee, you go to the NSSS vendor and you know, it costs you an arm and a leg to get any information. They're very sensitive to the fact that -- while the NSSS pretty much had the information, they -- they -- and they would let you look at it, they wouldn't let you have it because a lot of it was proprietary.

MR. WILKINS: All right.

MR. IMBRO: Many times we went to an vendor to ask to have some information researched. It was quite costly.

In fact, that's why a lot of people formed owners groups to pool the utilities together so they can it do it once for several plants.

MR. CARROLL: By hiring the NSSS vendor to do the work.

MR. IMBRO: You have no choice.

MR. CARROLL: For an arm and a leg.

MR. IMBRO: Right. I guess we can turn the presentation over to NUMARC.

MR. CARROLL: Am I going to see the words, design basis document and what we talked about yesterday?

MR. IMBRO: I think it's pretty much in there.

MR. CARROLL: I guess that was why I raised the question, because I couldn't find it in there.

MR. IMBRO: I believe that was something that we had even put into Tier I, system design descriptions and design criteria. I think you'll see it there.

MR. CARROLL: Good afternoon.

MR. MARION: My name is Alex Marion and I'm a Manager in the Technical Division at NUMARC. We're going to provide you with a brief overview of the design basis program guideline document that we had put together and that Gene Imbro had alluded to in his p[illegible]tation.

Tony Pietrangelo will be [illegible]ng that overview.

[Slide.]

MR. PIETRANGELO: Good after. I'm Tony Pietrangelo. I'm also in the Technical Division at NUMARC. Before I get into the presentation on the guidelines, I'd just like to say that it has been a long year and a half working on this document that we're about to publish in the next week or two.

We've had several meetings with the staff over the last year and a half to try to get their input into the document. I'll explain a little bit of what motivated us to start this in the first place.

I just wanted to say that all the meetings we've had with the staff have been very constructive and beneficial, we think, to the final product which I'm here to talk to you about today.

[Slide.]

MR. PIETRANGELO: Just as an overview of what I'd like to talk to you about; NUMARC established the design basis issues working group that I'll tell you about. We'll tell you what the working group's goals were in putting these guidelines together, and then I'll talk to you about the content of the guidelines and what we plan to do with them.

The working group was formed in July of last year. It consists of approximately 21 people. Our chairman was Dave Hoffman, the Vice President of Nuclear Operations at

Consumers Power. We had 12 utility representatives. These included vice presidents, engineering directors, program managers of DBD programs from different utilities.

We had a balance of all the Regions across the U.S. and also, we tried to get a mix of utilities with older vintage plants, newer plants and all NSSS vendors' plants were also represented on the working group. We also thought it was importa. to include representatives from each of the four NSSS vendors, in addition to the four architect engineers who are participants in NUMARC. We also had a representative from the Institute of Nuclear Power Operations on the working group.

Just a little bit about why NUMARC got involved in design basis issues and formed the working group: basically, our membership asked us to get involved. There was a lot of money being spent on design basis reconstitution programs over the last few years. I think Gene talked a little bit about that before.

There wasn't any consistent guidance in the industry about what an acceptable framework for a program would be, and quite frankly, there were a lot of people who already allocated extensive resources and other utilities about to lay out a lot of resources for a long term program. They wanted to have some sense of confidence about what was acceptable and what wasn't a good way to go.

I remember one of the remarks made by one of the executives in the Issues Management Committee at NUMARC was that we only want to do this once and we want to do it right. That was the primary motivation for NUMARC taking on design basis.

[Slide.]

MR. PIETRANGELO: The goals of the working group are as follows: these are right from the mission statement of the working group.

I think as Gene talked about before, there was some confusion in the industry concerning terminology, interpretation of design basis, design control, configuration management. A lot of the terms related to design bases that we thought we had to get a handle on before we could move forward with the guidelines.

That was the first objective that the working group tackled. Secondly, we wanted to lay out some broad objectives for design basis programs. We conducted a survey in September of last year of all the utilities with about fifty different applications that utilities had identified for the DBDs that they're producing through their programs.

From that survey, we were able to come up with what we called primary applications for the DBDs which formed the basis for the objectives that are noted in the document. Those objectives primarily focus on

modifications, 50.59 safety reviews, operability determinations, tech spec changes and FSAR updates.

Those five objectives are kind of the core that are represented in the guidelines that we think form a very good set from which to start with. Now, that certainly doesn't preclude utilities using the DBDs that they develop in their programs for other applications. We think those five are certainly a good place to start from.

The third objective was to develop design basis program guidelines and that kind of encompassed this whole set. The working group also reviewed design control and configuration management practices in the industry and that is touched on in one section of the guidelines.

As Gene got into before, develop positions on discrepancies, operability reportability determinations; that was identified by the working group members to us in the first meeting as a concern of utilities that had already had mature programs in place; that we needed to get a very firm process and positions down on how we wanted to handle this.

Lastly, we wanted to interface proactively with the staff. We felt that their input was very important and we wanted to get their assurances also that their concerns were addressed in the guidelines. I think we've done that to a large extent, and we're at the end of that process now

and we're moving forward.

[Slide.]

MR. PIETRANGELO: The next slide is on the intent of the guidelines. As I said before, we think that the guidelines address all the working group goals that I just laid out. In addition, it provides a level of assurance for those people who have programs in place.

We did a survey recently, just to take a snapshot of where utilities were with those design basis efforts. I know in conversations we've had over the last year, it was always no one knew exactly how many utilities had a program going, who were in the pilot phase, who were considering a program, who didn't want to do anything at all. The survey results showed that all utilities had at least assessed a need for a program, and that 90 percent of the stations in the country had a program completed, in progress, or in the pilot phase. So it was a very extensive voluntary effort by the utilities.

Those that had mature programs in place, we think the guidelines encompass a lot of the good practices that were identified by the utility members on the working group, and will give that level of assurance that we were looking for.

In addition, for those utilities that don't have a mature program in place at this point, we think the guidance

provided through the guidelines will be excellent for them in planning out their programs.

The guidelines are being offered to our members on a voluntary basis to use at their discretion. We did consider making the guidelines an industry initiative, and actually, we considered that twice in the last six months.

The working group's recommendation to NUMARC was that, because of the extensive voluntary effort, and because the programs are so tailored specifically for the individual utilities -- Gene talked a little bit about the differences in plant vintage, vendor -- a lot of utilities bought the calcs from the AEs during the turnovers; others didn't care about them at that time -- all sorts of different organizational differences that have an impact on the type of program that a utility wants to tailor -- we didn't think an initiative was appropriate, first because the resources had already been allocated by utilities, and usually an initiative is to focus those resources, and that wasn't necessary in this case.

Yes, sir?

MR. SHEWMON: Would you define your terms? It would seem to me your being here and what you have done on this is an industry initiative, but I obviously don't understand the words.

MR. PIETRANGELO: Okay. The industry initiative

that I refer to here is a board vote of the NUMARC board of directors which would require 80 percent of those directors to approve whatever the initiative encompasses, and that would be binding on all of the members, all right?

This was, yes, an initiative in that the working group was formed, but not a board initiative that everyone voted on.

MR. SHEWMON: I have heard that before. Thanks.

MR. PIETRANGELO: Okay.

[Slide.]

MR. PIETRANGELO: Okay. Now, on the guidelines themselves, just a brief outline of -- and I believe there is a copy available to you -- the intro, a section on definitions, the intent of DBDs. Developing DBDs is kind of a lessons learned session. A lot of this information was obtained from INPO that they compiled during their assistance visits and evaluations. It has a lot of good practices, if you will, on how to administer a DBD program and more, what pitfalls to look out for when you're putting a program together.

What we think is one of the key sections is addressing discrepancies. I have another slide that addresses that more specifically. Validation maintenance and control -- we felt this was important enough such that we needed another section in the guidelines. Certainly, if

you're going to allocate that much resources to this program, you want to make sure that you maintain a credible basis for the application of the documents.

A final section on integration with design control and configuration management. It's very important, we think, that utilities use the DBDs they produce in their programs in their existing design control and CM practices, and we touch on that in that one section.

Finally, several appendices to give a lot of examples of sources of DBD information, supporting information, applications, and also additional information to consider to be scoped into a DBD.

[Slide.]

MR. PIETRANGELO:

The key points, we feel, that are contained in the document, first of all is to focus the interpretation of design basis under 10CFR50.2 definition. Basically, that touches on information that identifies specific functions for a structure system or component, and also specific values or ranges of values that bound the design.

That's what the utility is responsible for. They have to know that information. Without compiling that information, and organizing and understanding it, you don't have a basis for any of the objectives that are laid out in the guidelines.

I think, as Gene touched on before, and I think Chairman Michelson also touched on in his question, you have to know the why information, also. That interpretive step is one of the things we think is a major focus of the guidelines. Getting that understanding of why the setpoint is set at 750 pounds and not at 700 pounds, that kind of information that supports the design basis is really the key. Not surprisingly, that is the information that most utilities are having trouble recollecting.

Ofttimes, you have to go back to the design engineers, if they are still around, and many of the utilities have compiled that information through interviews with those people, have been in correspondence and meeting minutes from meetings 20 years ago.

A lot of that good why information is contained in those kinds of sources, and not in a calc or some document you can really get your hands on that's in a file and filed neatly, but in an old engineer's file that he kept at his desk. A lot of the good information has been from those sources, the utilities have found.

Third, the other key point we wanted to make in the guidelines was that the program should enhance your existing design control and CM practices. One of the things we found, and this gets back to the terminology question, a lot of people were mixing terminology of design basis with

design control and configuration management.

The design bases and the DBDs that collate that information is something that you can get your hands around, that you can touch, you can feel, and that you can organize, whereas the design control and CM practices have been around since day one, okay? Those are existing practices at utilities. Whether you call them that or not, you've been doing that since your plant went commercial.

One of the things we think the programs are aimed at is enhancing the input to those processes through collating the design basis information and supporting information in DBD, and we think we'll see a big benefit in these practices.

[Slide.]

MR. PIETRANGELO: The other key area was on addressing discrepancies, and I don't want to focus too much on what Gene has mentioned previously, but the focus of the section that we have in the guidelines is on a managed approach.

Several utilities had gone through kind of a crisis atmosphere in trying to address discrepancies that came out of their reviews during their design basis efforts. We feel that that managed approach -- and I'll show you a slide in a minute that lays out the process of what we think the managed approach is all about -- entails.

The presumption of operability is essentially the same thing as Gene talked about and the premise of operability. If you have broad engineering experience and judgment and other sources of information that give you a good feeling about the operability of a structure system or component, just because you don't have a piece of paper such as a calc or evaluation gives you that airtight, yes, this is operable determination, doesn't mean that you shut down the plant and wait 'til you get the information. We think you can rely on that broad engineering experience and judgment in those types of cases.

Also, this section contains a subsection on simplifying reportability determinations in the LER process. I think Gene touched on that already.

And we did propose a modification policy change -- modification to enforcement policy. Originally, that was part of the guidelines. We ended up taking that out and sending a separate letter to the staff requesting consideration for that change. And, essentially, it was trying to remove it.

Well, we thought it was disincentive that if a utility, through a self-initiated effort, uncovers a discrepancy from possibly several years ago, takes appropriate corrective action and satisfies all the criteria in the exercise of discretion policy that's laid out now.

We didn't think it was appropriate to nail the utility also with a notice of violation in those cases.

So, basically, what our request does is expands the scope of the exercise of discretion.

[Slide.]

Finally, I just want to talk a little bit about this process for managing discrepancies.

The first box is the discrepancy determination. And, basically, this is kind of a prescreen such that we wanted to draw a distinction between open items and discrepancies. There are many questions raised during the course of a design basis program that come up. And we don't suggest that all of those questions get run through this process.

What we think, though, is that when there is a confirmed discrepancy that has a potential for impacting plant operation that it be elevated into this process. At that point, we have a screen called safety concern where three basic questions are asked to determine whether you ought to proceed with formal operability and reportability evaluations.

Following that, a decision block as to if you do have something that is an operability issue you would take the appropriate tech spec action. If not, you would complete the system DBD.

Same with reportability. And then if you did have a reportable issue you'd file your LER and complete the activity. If not, you'd just go right on to the complete activity block.

What that block does is allows that process of collating the information, and for most utilities this is a three or four month process where they'll get together with their NSSS vendor and AE, go back through all the old files, do their interviews, get all that information together. In that process is where some of these discrepancies come up.

What we do here in this block is allow them to complete that activity and get what they think is that whole set of information on the system that they originally sought, then go to a final evaluation block where all that information is reviewed.

Any operability issues, reportability issues are also reviewed cumulatively so that any synergistic effects in the system are looked at in a comprehensive fashion. Then you would proceed to the closeout of whatever the discrepancy.

We think this process is good in that it shows a structure for addressing these problems as they come up, and if they are significant safety concerns then they're evaluated by the appropriate people in an appropriate time frame.

And we think this process is terrific for these programs. And I think it's pretty much what people are already following in their day to day plant operations also.

That's all I have to say today.

MR. CARROLL: Can we go off the record for just a second?

MR. PIETRANGELO: Sure.

[Brief recess.]

MR. CARROLL: Back on the record.

MR. SHEWMON: What is the definition of a discrepancy on your last slide -- design basis discrepancy. This is --

MR. PIETRANGELO: A discrepancy is an item that has been confirmed discrepant in that you have done some evaluation of it already. Let's say two documents don't match or give the same value for a particular parameter.

MR. WILKINS: It might be helpful if you could give us an example of a discrepant.

MR. PIETRANGELO: Well, let's say you're researching to do your DBD and on two source documents two different values are given, okay, for the same parameter. Okay? That would be a discrepancy. Now is it safety significant? Well, if one of the discrepancies, let's say, was above a tech spec value, then I'd say, yeah, that's potentially safety significant and you would elevate it into

that process.

But if there was a mismatch in the values but they were both within, let's say, some tech spec value, then I wouldn't consider that safety significant and wouldn't evaluate it into that process.

It could be mismatches with hardware and software also that you'd find when you were doing the validation of the DBD in the field later.

So it could be from a number of different sources, actually.

MR. CARROLL: Looking at your definitions, it looks like you've gotten a little circular here. Under open items you're saying that there are things that are potential discrepancies. And under discrepancies you're saying, those open items are confirmed discrepant.

MR. PIETRANGELO: Yeah. And what that is is I think open items is very broad. One working group member defined it as anything not closed. Okay? So any question that any engineer had could be an open item that someone would want to document, but you would not necessarily want to elevate it such that you're doing formal operability and reportability evaluations on it.

MR. CARROLL: When you see one you know it.

MR. PIETRANGELO: Exactly. And that's been people's experience.

MR. CARROLL: Any questions?

[No response.]

MR. PIETRANGELO: Thank you.

MR. MARION: This is Alex Marion again. I would just like to indicate that we are moving forward with holding two industry workshops on the guideline and we've invited the NRC to participate in those workshops and they have graciously accepted our invitation. We're planning to conduct them the last week of November and the first week of December.

We expect our activities to be reasonably completed after the December workshop.

MR. WILKINS: Where?

MR. MARION: Baltimore in November, and New Orleans, for some reason or other, in December. We felt we ought to get a couple of bennies out of the effort, to be honest with you.

MR. CARROLL: Does the staff have anything they want to say in closing?

MR. GRIMES: No. I think it's been a useful effort. At lot of times on these difficult questions, the process is most of the benefit and I think both the staff and the industry have learned a lot just by the process of struggling with the questions over the last couple of years.

MR. CARROLL: For the full committee on Thursday

morning, 10:45 to 11:15, a half hour, I guess the plan is -- oh, no, that's Level of Detail.

Sorry, it's 45 minutes, 3:30 to 4:15 on Friday. I guess I'm one of three subcommittee chairmen to report. Do you feel that we need either the staff or NUMARC, or should I just make a brief report on what we heard about?

MR. WILKINS: I think you can say that the NUMARC document is about to hit the street.

MR. GRIMES: The staff sees no reason to make a presentation to the full committee. I think you can characterize it well.

MR. CARROLL: You just don't like to expose yourself, right?

MR. GRIMES: They told me ROTC to not buzz anyplace and don't buzz anyplace twice.

[Laughter.]

MR. CARROLL: Okay, we'll handle it that way. I'd like to thank the staff of NUMARC for their informative presentations. With that, we shall adjourn.

[Whereupon, at 2:30 p.m., the Subcommittee was adjourned.]

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission

in the matter of:

NAME OF PROCEEDING: Plant Operation

DOCKET NUMBER:

PLACE OF PROCEEDING: Bethesda, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Lynn Estep

Official Reporter
Ann Riley & Associates, Ltd.

ACRS Subcommittee on Plant Operations

November 1, 1990

NUMARC Design Basis Program Guidelines

Tony Pietrangelo
Senior Project Manager
NUMARC, Technical Division

OVERVIEW

- NUMARC DBI Working Group
- DBI Working Group Goals
- Design Basis Program Guidelines

NUMARC DESIGN BASIS ISSUES WORKING GROUP

CHAIRMAN: DAVID HOFFMAN
VP, NUCLEAR OPERATIONS
CONSUMERS POWER

12 UTILITIES REPRESENTING ALL NRC REGIONS

4 NSSS VENDORS: WESTINGHOUSE
BABCOCK & WILCOX
GENERAL ELECTRIC
COMBUSTION ENGINEERING

4 A/Es: BECHTEL
FLUOR-DANIEL
UNITED ENGINEERS
STONE & WEBSTER

INPO

DBI WORKING GROUP GOALS

- Develop clear terminology
- Identify objectives for DB Programs
- Develop Design Basis Program Guidelines
- Review design control and configuration management practices
- Develop positions on discrepancy disposition, operability and reportability determinations
- Interface proactively with NRC to address industry and regulatory concerns

DESIGN BASIS PROGRAM GUIDELINES

INTENT

- Address all Working Group goals
- Provide level of assurance for existing programs
- Provide guidance for those considering programs
- For utility use on a voluntary basis
- Not an Industry Initiative

DESIGN BASIS PROGRAM GUIDELINES

OUTLINE

- Introduction
- Definitions
- Intent of DBDs
- Developing DBDs
- Addressing Discrepancies
- Validation, Maintenance and Control
- Integration with Design Control and Configuration Management
- Appendices

DESIGN BASIS PROGRAM GUIDELINES

KEY POINTS

- Focus interpretation of "design bases" per 10CFR50.2 definition:
  - specific functions
  - specific values that bound design
- Capture "why" information that supports design bases and utility specific program objectives
- Design basis program should enhance existing design control and configuration management practices

DESIGN BASIS PROGRAM GUIDELINES

ADDRESSING DISCREPANCIES

- Managed approach
- Presumption of operability
- Simplify reportability determinations and LER process
- Propose modification to NRC enforcement policy

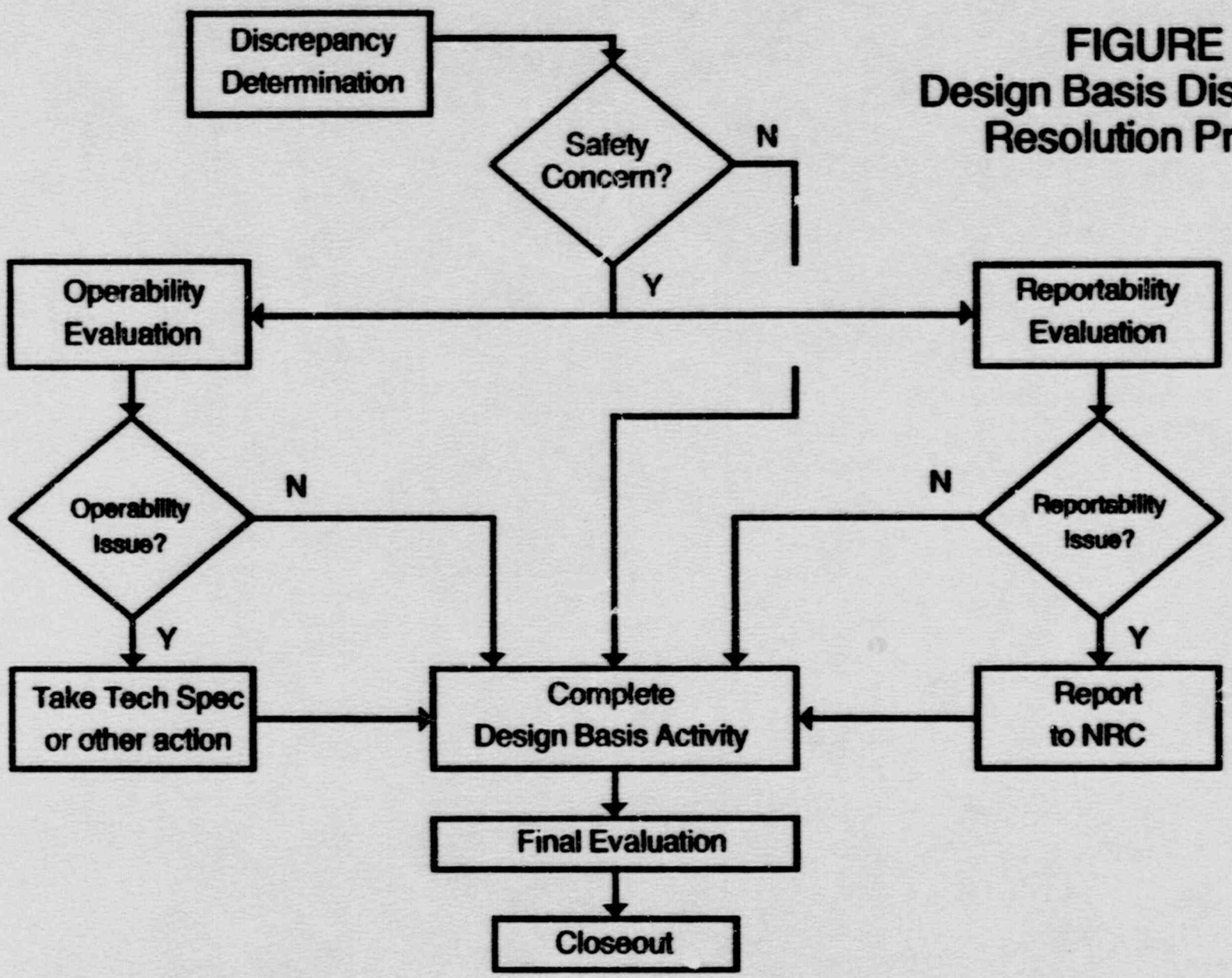

FIGURE 2
Design Basis Discrepancy Resolution Process

RECONSTITUTION OF DESIGN BASES AND DESIGN DOCUMENTS

BY

EUGENE V. IMBRO
U.S. NUCLEAR REGULATORY COMMISSION

- NRC TEAM INSPECTIONS (SSFI, SSOMI) HAVE IDENTIFIED THAT:

  (1) MODIFICATIONS HAVE BEEN MADE WITHOUT SUFFICIENT ENGINEERING BASIS THAT HAVE COMPROMISED SAFETY SYSTEM FUNCTIONALITY.

  (2) MISSING OR UNRETRIEVABLE DESIGN DOCUMENTATION APPEARS TO BE A ROOT CAUSE OF THESE PROBLEMS

- AS A RESULT MANY UTILITIES HAVE BEGUN DESIGN BASES RECONSTITUTION PROGRAMS

WHAT ARE DESIGN DOCUMENTS?

DESIGN DOCUMENTS ARE THOSE DOCUMENTS TO WHICH ONE CAN REFER TO VERIFY THAT STRUCTURES, SYSTEMS, AND COMPONENTS HAVE BEEN DESIGNED TO PERFORM THEIR IDENTIFIED FUNCTION WITHIN THE REFERENCE BOUNDS OF THE CONTROLLING PARAMETERS.

CATEGORIES OF DESIGN DOCUMENTS

DESIGN INPUT DOCUMENTS

- NRC REGULATIONS
- STD. REVIEW PLAN
- REG. GUIDES
- INDUSTRY STD's.
- DESIGN PROCEDURES
  (A/E - NSSS SUPPLIER, ETC.)
- VENDOR PERFORMANCE REQUIREMENTS
- ETC.

DESIGN ANALYSES

- CALCULATIONS
- EVALUATIONS
- TRADE-OFF/OPTIMIZATION
- STUDIES
- ETC.

DESIGN OUTPUT DOCUMENTS

- DRAWINGS
- PURCHASE SPECS
- "Q" LIST
- DESIGN INTERFACE
  DOCUMENTS
- SETPOINT LIST
- VALVE LIST
- ETC.

THE REGULATORY DESIGN BASIS IS A SUBSET OF THE ENGINEERING DESIGN BASIS

REGULATORY DESIGN BASIS (10 CFR 50.2)

- o NRC REGULATIONS
- o TECH SPECS
- o SER

- o LICENSEE COMMITMENTS
  - FSAR
  - LERs
  - CORRESPONDENCE

ENGINEERING DESIGN BASIS

- o REGULATORY DESIGN BASIS
- o NON SAFETY-RELATED CRITERIA FOR STRUCTURES SYSTEMS, & COMPONENTS PERFORMANCE

- o DOCUMENTED "GOOD ENGINEERING PRACTICE"
  - NEMA STDs
  - TEMA STDs
  - ISA STDs
  - ASHRAE STDs
  - HYDRAULIC INSTITUTE STDs
  - A/E - NSSS SUPPLIER DESIGN PROCEDURES
  - ETC.

WHY ARE DESIGN DOCUMENTS NECESSARY?

- FORM THE BASIS FOR FUTURE PLANT MODIFICATIONS
- QUANTIFY DESIGN MARGINS AND DEFINE OPERATING ENVELOPE
  - BASIS FOR 50.59 EVALUATIONS
- FORM A LIVING RECORD OF THE AS-CONFIGURED PLANT
- PROVIDE A TECHNICAL BASIS FOR CONTINUED OPERATION (INCLUDING LIFE EXTENSION)

STAFF ACTIONS

- o PERFORM LIMITED INDUSTRY SURVEY BY VISITING 6 LICENSEES AND 1 NSSS VENDOR
- o COLLECT INFORMATION
  - DESIGN DOCUMENT AVAILABILITY
  - CHANGE CONTROL PROCESS
  - INTERFACE BETWEEN ENGINEERING, MAINTENANCE, OPERATIONS, TRAINING AND LICENSING
  - UTILITY-INITIATED DESIGN BASIS DOCUMENT RECONSTITUTION PROGRAMS

STAFF ACTIONS (CON'T)

- o ISSUE NUREG TO PROVIDE INFORMATION ON GOOD PRACTICE IN THE FOLLOWING AREAS:
  - TYPES OF DESIGN DOCUMENTS THAT SHOULD BE CONTROLLED AND MAINTAINED AS-FIGURED
  - THE CIRCUMSTANCES AND TIMEFRAME THAT DESIGN DOCUMENTS SHOULD BE RECREATED, IF AT ALL
  - EVALUATION OF STRENGTHS AND WEAKNESSES OF UTILITY-INITIATED DESIGN BASIS DOCUMENT RECONSTITUTION PROGRAMS

    CURRENT PRACTICES IN DESIGN CONTROL/CONFIGURATION MANAGEMENT

LICENSEES SURVEYED

o CAROLINA POWER AND LIGHT	-	H.B. ROBINSON - 2
o PENNSYLVANIA POWER AND LIGHT	-	SUSQUEHANNA
o PACIFIC GAS AND ELECTRIC	-	DIABLO CANYON
o OMAHA PUBLIC POWER DISTRICT	-	FT. CALHOUN
o FLORIDA POWER CORPORATION	-	CRYSTAL RIVER 3
o FLORIDA POWER AND LIGHT	-	TURKEY POINT 3 AND 4

NSSS VENDORS SURVEYED

- GENERAL ELECTRIC

LEVEL OF DESIGN DOCUMENTATION

- ESSENTIAL DESIGN DOCUMENTS
- SUFFICIENT DESIGN DOCUMENTATION SHOULD BE AVAILABLE FOR FUTURE PLANT MODIFICATIONS TO SUPPORT THE FINAL AS-CONFIGURED DESIGN OF THE SYSTEM BEING MODIFIED
- THIS MAY REQUIRE THE REGENERATION OF MISSING DOCUMENTATION

DESIGN AUTHORITY

AFTER THE O/L, THE OPERATING ORGANIZATION GENERALLY DRIVES MODIFICATIONS AND MAINTENANCE, HOWEVER, THE ENGINEERING ORGANIZATION SHOULD BE RESPONSIBLE FOR:

- MAINTAINING THE PLANT DESIGN BASES
- ASSURING DESIGN OUTPUT DOCUMENTS REFLECT THE CURRENT DESIGN BASES
- ASSURING DESIGN OUTPUT REQUIREMENTS FOR PLANNED MODIFICATIONS ARE COORDINATED WITH THE PLANT STAFF.

SURVEY OBSERVATIONS

- o DESIGN DOCUMENT RECONSTITUION PROGRAMS
  - ALL UTILITIES SHOULD EVALUATE THE NEED TO INITIATE A DESIGN DOCUMENT RECONSTITUTION PROGRAM (DDR)
  - NEED FOR DDR PROGRAM PROPORTIONAL TO FACILITY AGE
  - A DESIGN DOCUMENT RECONSTITUTION PROGRAM SHOULD MEET UNIQUE UTILITY NEEDS
  - NEED FOR UTILITY STAFF INVOLVEMENT IN DDR PROGRAMS
  - NEED FOR STRONGER IN-HOUSE ENGINEERING CAPABILITIES
  - DESIGN BASIS DOCUMENTS (DBDs) SHOULD BE CONTROLLED DOCUMENTS AND MAINTAINED AS-BUILT
  - DBDs PROVIDE A CENTRALIZED LOCATION FOR DESIGN INFORMATION

SURVEY OBSERVATIONS (CON'T)

- NEED FOR TEMPLATE APPROACH
- RECONSTITUTION OF DESIGN BASES ALONE MAY BE INSUFFICIENT. CONSIDERATION SHOULD BE GIVEN TO REGENERATION OF SUPPORTING CALCULATIONS
- NEED FOR A DEFINED PRIORITIZATION METHODOLOGY TO REGENERATE MISSING DESIGN DOCUMENTS
- CONCEPT OF ESSENTIAL DOCUMENTS IS NECESSARY TO REQUIRE REGENERATION OF [illegible] SUPPORTING OPERATIONAL LIMITS
- NEED FOR FIELD VALIDATION [illegible] DESIGN BASES DOCUMENTS
- NEED FOR TECHNICAL REVIEWS OF DESIGN DOCUMENTS

OPERABILITY, REPORTABILITY, ENFORCEMENT

- o OPERABILITY DETERMINATIONS
  - NEED TO MAKE OPERABILITY DECISIONS IN A TIME FRAME COMMENSURATE WITH SAFETY SIGNIFICANCE
  - PREMISE OF OPERABILITY
  - CONTINUOUS DECISION PROCESS
- o REPORTABILITY
  - NO CHANGE IN NRC REPORTING REQUIREMENTS
  - PREPARATION OF FINAL EVALUATION OF LERs FOR EACH SYSTEM TO IDENTIFY CORRECTIVE ACTIONS
- o ENFORCEMENT POLICY
  - ENCOURAGES UTILITY-INTIATED PROGRAMS