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OFFICIAL TRANSCRIPT OF PROCEEDINGS

0/1 TR04 (ACRS)
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B.J.WHITE, ACRS-P-315

THANKS! Barbara Jo

#27288

Agency: U.S. Nuclear Regulatory Commission
Advisory Committee On Reactor Safeguards

Title: 393rd ACRS Meeting

Docket No.

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PUBLIC NOTICE BY THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: Friday, January 8, 1993

The contents of this transcript of the proceedings of the United States Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards, (date) Friday, January 8, 1993, as Reported herein, are a record of the discussions recorded at the meeting held on the above date.

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

393rd Meeting

Nuclear Regulatory Commission

7920 Norfolk Avenue

Bethesda, Maryland

Friday, January 8, 1993

The meeting convened, pursuant to adjournment, at 8:30 a.m., P. Shewmon, Chairman of the Committee, presiding.

Members Present:

P. Shewmon

J. Carroll

I. Catton

P. Davis

T. Kress

H. Lewis

W. Lindblad

C. Michelson

E. Wilkins

C. Wylie

Designated Federal Official:

E. Igne

PROCEEDINGS

MR. SHEWMON: Good morning. This is the second day of the 393rd meeting of the ACRS. During today's meeting the Committee will discuss or hear reports on proposed revision of NRC performance indicator reports, subcommittee activities, which I guess means planning and procedures, activities of ACRS working groups, proposed ACRS reports.

The meeting is being conducted in accordance with provisions of the Federal Advisory Committee Act. Mr. Igne, on my right, is the designated federal employee for the initial portion of the meeting.

We have received no written statements or requests for time to make oral statements from members of the public regarding today's session.

A transcript of portions of the meeting is being kept. It is requested that each speaker use one of the microphones, identify himself or herself, and speak with sufficient clarity and volume so that he or she can be readily heard.

The first item we have today is performance indicators.

MR. BARANOWSKY: Good morning. My name is Pat Baranowsky. I'm chief of the Trends and Patterns Analysis Branch. We are responsible for conducting the performance

indicator program. I have with me today Tom Novak, who is our division director, and Don Hickman, who is chief of the performance indicator section and who will be giving the presentation, and some other staffers from our branch who might assist in answering some questions.

On December 23 SECY-425 was sent to the Commission with a recommendation to implement some enhancements to the performance indicator analysis and display of information. Pending approval by the Commission, we plan to implement those enhancements for the first quarter 1993 performance indicator report.

Today Don Hickman is going to give a summary of the information provided in that SECY paper. He'll include a short background on what the program is about and its history. Primarily he will discuss proposed enhancements and the changes in the displays in the reports that we plan to implement.

With that, let me get Don Hickman to give the presentation.

[Slide.]

MR. HICKMAN: Good morning, gentlemen. As Pat said, I'm Don Hickman, the chief of the performance indicator section in AEOD. I'm pleased to have this opportunity to present to you the latest improvements to the performance indicator program that we have just recently

sent to the Commission for approval.

[Slide.]

MR. HICKMAN: The performance indicator program is a coordinated overall NRC program under the direction of AEOD.

The program has been producing quarterly reports since February of 1987. The first report included two years of data for calendar years 1985 and 1986.

The addition of new indicators or major changes to the program are subject to Commission approval.

Because of the potential for misuse of performance indicators, there have been restrictions placed upon their use. These restrictions are contained in Announcement 200, signed out by the Executive Director of Operations. I've included a copy of that in the attachment, the yellow pages attached to your handout.

MR. LEWIS: I hate to interrupt you so early in the morning, because many of my friends aren't all here yet, but you said this is a program which is coordinated; it's throughout NRC; it's under the direction of AEOD. Does that mean AEOD commands some resources in the rest of NRC outside of its own division?

MR. HICKMAN: AEOD uses as a source of the performance indicators the licensee event reports which are submitted.

MR. LEWIS: But you said it was a program that extended throughout all of NRC and it was coordinated. I'm trying to find out how the rest of NRC fits into it. Is it just done by AEOD?

MR. HICKMAN: The official NRC performance indicator program is that program done by AEOD.

MR. LEWIS: I'm trying to understand what you meant by coordinated throughout NRC.

MR. HICKMAN: That means that the reports that AEOD publishes are the only official performance indicators used by the NRC.

MR. LEWIS: But It's being done in AEOD.

MR. HICKMAN: It's being done in AEOD and it's distributed throughout the NRC.

MR. LINDBLAD: Distributed.

MR. LEWIS: I don't think that's the word you used at the beginning. Maybe it is. Distributed, in fact, outside NRC too.

MR. HICKMAN: Outside of NRC. We send them to licensees.

MR. LEWIS: I see. It's simply an AEOD program. That's what I'm trying to understand. Okay.

MR. HICKMAN: From the Announcement 200 which you see there I will briefly summarize some of the major restrictions on the use of the performance indicators.

First of all, they are intended as a tool for senior NRC managers to monitor trends and overall performance at individual power plants.

They are to be viewed as a set to provide additional information on performance level.

They are one of several tools. They are not to be overemphasized in relation to any of the other tools that the NRC uses.

Finally, they are not to be used to rank plants.

MR. SHEWMON: Just to see what the words mean, are the SALP ratings used to rank plants?

MR. HICKMAN: No. We do not attempt to rank plants.

MR. SHEWMON: Fine. By your parlance, you never rank plants; they just happen to be divided into good, bad and indifferent.

MR. HICKMAN: That's true.

[Slide.]

MR. HICKMAN: These are the eight performance indicators that are currently published quarterly.

The newest indicator is the cause codes indicator. It was added to the program in 1989. Cause codes capture programmatic causes of every reportable event in six areas. Collectively they are treated as one indicator.

[Slide.]

MR. HICKMAN: These are the six programmatic areas in which the cause codes identify each LER submitted to the NRC. The cause code program was approved by the Commission in 1989.

[Slide.]

MR. HICKMAN: As I said, they identify programmatic causes of every licensee event report submitted to the NRC. At the time we submitted this program to the Commission for approval the Commission approved the use of cause code trends, that is, comparison of each plant's performance in the cause code indicator to its previous past performance.

The Staff recommended that the Commission approve comparison of cause codes to the average of the NSSS vendor group for each individual plant. At that time the Commission was concerned that this would result in comparison of a plant such as Ginna to a group which included a plant such as South Texas.

MR. MICHELSON: Excuse me. Are the cause codes that INPO uses about the same, or are they using their own set?

MR. HICKMAN: I'm not aware of any cause codes that INPO uses.

MR. MICHELSON: In their own LER tracking system they have causes. I don't know if they relate to these same

causes or not. They have their own database for LERs.

MR. BARANOWSKY: We give them LER information. They get that from us. And they have access to sequence coding and search systems. To the best of my knowledge, they do not have an independent LER cause coding, although they review each LER and have some sort of a significance ranking. I forget the name of their program.

MR. MICHELSON: It's the CN program.

MR. BARANOWSKY: It's not the equivalent of cause codes, though.

MR. MICHELSON: When they set that up in the early 1980s they also had cause codes. I just wondered whether there has been any attempt to make a standard so when they talk about a cause everybody is thinking the same thing.

MR. NOVAK: This is Tom Novak. The causes that we identify are what we draw from the event. The licensee has his own cause. In many cases they are similar, but as part of the development of this indicator we decided that from the basis of our own reading we would identify a cause. Generally we attach about two causes to the complete event. There is not a single cause for the event. Generally you have about two causes per licensee event report.

MR. MICHELSON: My only reason for the inquiry was I was wondering if we had become sophisticated enough to where everybody had a common cause compilation. You could

have a universal standard for causes.

MR. LEWIS: Maybe you defined it but I'm not quite clear. What is a programmatic cause as distinguished from a real cause?

MR. HICKMAN: As opposed to root causes of events. We are looking at programmatic areas, programmatic weaknesses that were involved in the events.

MR. LEWIS: What does programmatic mean in this context?

MR. HICKMAN: We had the list of the cause codes here. Maintenance, for example. One of the cause codes is maintenance. If we believe that there was some sort of maintenance deficiency involved in the event, such as a poor preventive maintenance program.

MR. LEWIS: I begin to see it. Would I be unfair if I said what you mean by programmatic cause is a cause that can be attributed to something that can be corrected by NRC regulation? Is that what is meant by a programmatic cause?

MR. HICKMAN: No.

MR. LEWIS: Then what is it? If something breaks, say a shaft breaks on a motor, then the cause wouldn't be a broken shaft; the cause would be whoever manufactured it or somebody who didn't look at it, or something like that?

MR. HICKMAN: That could conceivably be a design

weakness. It could be an installation weakness. There are various things that it could be, depending on what the LER says.

MR. LEWIS: When lightning hits something and destroys it we don't blame it on God. That's because insufficient lightning protection was built in. You're trying to pin it on somebody. That's the sense I have. I may be wrong about that.

MR. HICKMAN: External events are captured under the miscellaneous cause code, such as lightning, flood.

MR. LEWIS: I'm trying to find out whether you are looking for a technical cause or for a punishable cause.

MR. HICKMAN: Actually neither.

MR. NOVAK: We are trying to identify if from the events and from the equipment failures or the operator errors that occur can we see some recurring programmatic area, whether it's maintenance, whether it's the operations side of the house. I think if you look at our trends you will see what we are trying to do. This is just one other way of looking at the data other than counting the number of times an RHR pump failed. We are interested in more or less is this plant having more maintenance problems.

MR. LEWIS: I'm just trying to find out whether you are slipping something by me with that word "programmatic" or whether you are looking for the wallet

under the lamppost. But you're telling me I'll find out as you go along if I let you go along.

MR. WILKINS: Hal, I have inferred from looking at the list of cause codes that the first bullet would be just as meaningful if the word "programmatic" were deleted.

MR. HICKMAN: The reason that we included that word was because these are not intended to be root causes of events. We don't believe we can get those for every event out of the LERs.

MR. WILKINS: Nevertheless, you say that each reportable event has a cause code.

MR. HICKMAN: That's correct.

MR. LEWIS: That's what it says.

MR. WILKINS: One or more cause codes. The list of possible cause codes was on the preceding slide and there are six of those. So you assign each reportable event one or more of those cause codes, and the word "programmatic" in that context is meaningless. It's one of these six.

MR. HICKMAN: I'll see to that.

MR. LEWIS: I'm delighted that you understand.

MR. WILKINS: I'm not sure I understand, but I have stated my understanding.

MR. SHEWMON: We've all agreed on this. Why don't you go on.

MR. HICKMAN: Okay.

MR. LEWIS: Paul, forgive me. I think it's important at the very beginning.

MR. SHEWMON: Would you like to have him scratch it out? Would that make you allow him to go on?

MR. LEWIS: No. Actually having him explain it clearly enough that it could be understood would help a great deal.

MR. SHEWMON: Do you think he hasn't explained it yet?

MR. LEWIS: No.

MR. SHEWMON: Well, I'm not sure he can to your satisfaction.

MR. LEWIS: That's entirely possible. That's what I'm trying to find out.

MR. HICKMAN: Maybe as we go on one of the things that I could do is explain to you how we use the performance indicators, and that may help to clear it up.

MR. CARROLL: Let me ask a related question. Have you seen any indication that people are less forthcoming in writing LERs as a result of having this program?

MR. HICKMAN: No, we have not seen that. There is a great deal of interest in the industry about cause codes and we provide them information freely. They in fact attempt to do their own coding of events to see how it matches ours. But I've not seen any impact upon reporting

as a result of that.

MR. CARROLL: Having written LERs personally myself, I know that you can make judgments and say we don't really need to send one in on this event. There are some very gray areas there. Okay.

MR. HICKMAN: To finish up this slide, the Commission did not approve the use of cause codes to compare an individual plant against an NSSS vendor because of the wide variation in design within the vendor groups. So the Commission then directed the Staff to develop appropriate peer groups to be used for the purpose of comparing cause codes from an individual plant to some appropriate peer group.

[Slide.]

MR. HICKMAN: As we got into that study we learned that cause code data are cyclic with an interval that corresponded to the time interval between refueling outages.

We looked into this further and found that in fact there is an effect of the mode of operation throughout the cycle upon the cause codes.

We also found that the types of events which occurred throughout the cycle were a function of the mode of operation of the plant. The types of modes that we are talking about are things such as startup, power operations, refueling outages, non-refueling outages, that type of

thing.

[Slide.]

MR. HICKMAN: We then developed techniques to incorporate peer groups and these operating cycle phase effects into the PI program. The major benefits of these techniques are the three shown on this slide.

We have indicators now for both the operational period and the shutdown period for each plant. We compare the indicators for an individual plant to its peer group, and we have indicated the statistical significance of the trends and comparisons that we make.

I want to add at this point that we developed these methods for the purpose of comparing cause codes. We found, however, that these are suitable peer groups and suitable techniques to use for all of the performance indicators.

MR. WILKINS: Are you going to tell us later what you do when you discover that the peer group for Plant A is significantly statistically worse than Plant B?

MR. HICKMAN: I can get into that.

[Slide.]

MR. HICKMAN: A brief history of the development program. We utilized two national labs and the NRC's Interoffice Task Group on performance indicators.

We developed the peer groups at the Idaho National

Engineering Laboratory.

The Oak Ridge Laboratcry worked on the operating cycle phases.

We used both tc help develop the calculational and display methods that we use.

Then we ran a trial program which used the Interoffice Task Group and their feedback to help improve the human factors aspects of the displays.

We also provided draft copies of the new format to senior managers at the most recent screening meetings that were held in October and November. The comments from the senior managers ranged from "no objection" to "quite good."

The Interoffice Task Group felt that the presentations by the new format were an improvement over the previous methods and provided more information.

MR. CARROLL: Who makes up this Interoffice Task Group?

MR. HICKMAN: The Interoffice Task Group is composed of representatives from each of the regions, several from NRR, Research, and AEOD. It's a working group level to develop the techniques that the workers can use.

[Slide.]

MR. HICKMAN: Let me get into some of the issues that we looked at for developing the peer groups and the operating cycle effects.

We looked at more than 80 factors which were broadly categorized into three major areas, that is, design, regulatory issues, and organization.

We decided that the design factors were the most important, that the regulatory issues were next. We didn't look at the organizational factors because that's the effect that we wanted to measure through the performance indicators, how individual licensees performed given a particular plant.

A couple of other important issues. We needed to determine the minimum group size to have valid statistics for a peer group, and we also sought input from the owner's groups.

The minimum group size effort determined that on the order of six would be the minimum group size we could have to have valid statistics.

With that input, then we used the design and regulatory issues in order to achieve that minimum number. These are the factors that we have considered and have now incorporated into our peer groups.

MR. MICHELSON: Would you refresh my memory again as to what you meant by group?

MR. HICKMAN: A peer group is a group of similar plants that we are using to compare the performance of an individual plant against.

MR. MICHELSON: If it's a multi-unit plant it's still one member of the peer group and you evaluate both units of that plant or all three?

MR. HICKMAN: We consider each unit separately.

MR. MICHELSON: It's a group of units that you are looking at; is that right?

MR. NOVAK: That's correct. Oconee would represent three units.

MR. MICHELSON: You are going to do it on a per-plant basis?

MR. NOVAK: Per reactor.

MR. CARROLL: Per unit.

MR. MICHELSON: Well, I hear two stories. He said Oconee was three units, and that's quite right, but is that one member of the group?

MR. WILKINS: It's three units of the group.

MR. HICKMAN: It's three members of the group.

MR. MICHELSON: I could just have two plants each with three units and have a group.

MR. CARROLL: Why don't you show the next slide. I think that will clear it up.

MR. NOVAK: In the performance indicator we have never averaged out a dual unit site and said here's the performance of that site. We've always represented each reactor individually.

MR. MICHELSON: The problem is, of course, a lot of LERs may be a plant LER and not a unit LER. They report it as a unit LER but it's a common problem they have.

MR. BARANOWSKY: Most of them are unit-specific LERs. For instance, we wouldn't call TMI 1 and TMI 2 an average plant. I don't know how you would get that average. So we have to go with individual units.

MR. MICHELSON: I just wanted to make sure I understood what your group would be. Thank you.

MR. HICKMAN: LERs that are applicable to more than one unit are assigned to all units that are applicable.

MR. MICHELSON: All units that you may have in your group. You cited Oconee as a case. If Oconee is a member of the group it counts as three, anything on any of the three units?

MR. NOVAK: No. I'm sorry, Carl. If you look at the B&W plants, there are seven operating B&W reactor designs. That met our minimum peer group. In other words, we had to have at least six operating units based on the work we did. Each Oconee unit reports its own LERs. There is some commonality. I recognize that. But on occasion that LER will be applied to two units. It may be represented on more than one unit.

MR. MICHELSON: In that case your group was nearly all the B&W units, because there aren't many. How about the

case of boiling or pressurized?

MR. NOVAK: We'll show you that.

[Slide.]

MR. HICKMAN: Let me finish up this slide. Then we can get into that.

We talked to the owners' groups, the Westinghouse and GE owners' groups and got their input. Their input primarily focused upon the licensing date relative to TMI 2. They have developed their own peer groups for their own purposes. They find that that is an important factor.

[Slide.]

MR. HICKMAN: These are the peer groups.

MR. CARROLL: These are the new peer groups.

MR. HICKMAN: These are the new peer groups.

MR. CARROLL: The old ones were what?

MR. HICKMAN: In the past the only peer groups we really used was a differentiation between PWRs and BWRs. That's as far as we got.

MR. CARROLL: Thank you.

MR. HICKMAN: The GE plants are divided into two groups, basically along the lines of the licensing date pre- and post-TMI. The Westinghouse plants are divided into four groups.

MR. SHEWMON: Sir, you did have trend lines, though, and for trend lines you would use all BWRs or all

PWRs?

MR. HICKMAN: There were only two performance indicators for which we broke up the industry at all into B's and P's, and that was for the safety system failure indicator and the collective radiation exposure indicator.

MR. SHEWMON: Fine.

Carl, go ahead.

MR. MICHELSON: Now you are getting back to plants again. Which of the plants are units?

MR. HICKMAN: There are seven B&W units. We count them all separately.

MR. SHEWMON: Your slide says plants.

MR. WILKINS: Yes, but it says all B&W plants and some B&W plants have more than one unit.

MR. NOVAK: Let me give you an example. Beaver Valley has one unit in the old 3 loop and one unit in the new 3 loop. That was the way we thought we could best represent those two units. So they don't appear in the same peer groups.

MR. HICKMAN: Substitute the word "units" for plants in that top bullet and maybe that will help.

MR. MICHELSON: I think on all the bullets you've got to do that, not just the top one.

MR. CARROLL: Or Millstone, the three units.

MR. HICKMAN: Millstone is in three separate peer

groups.

MR. SEALE: I can't help but ask this. Have you considered a peer group comparison where the comparison is between regions?

MR. HICKMAN: We do look at that. We look at that when we are evaluating plants, largely because the screening meetings that Dr. Murley holds are by region. So when a region comes in, we look to see within that region which plants are the poor performance and which plants are the better performance, but we really don't do much with that.

MR. SEALE: I'm saying between regions.

MR. HICKMAN: That has been done. We don't use it at all.

MR. SEALE: I can see where that might be an internally useful thing.

MR. HICKMAN: Yes.

[Slide.]

MR. HICKMAN: To determine the effects of the operating cycle, we determine that these effects were largely due to changes. First of all, it was based upon this observed effect that the rate of cause codes varied with the phase in the cycle. We determined that that was due to the change in activities between a refueling outage and initial plant startup, power operations and that sort of thing. We looked to identify those phases of an operating

cycle in which plant activities changed significantly.

[Slide.]

MR. HICKMAN: The result was the five phases shown on the top: startup, power operations, pre-refueling, refueling outage, and non-refueling outages.

We track this data and we tabulate it and we publish it in the draft PI report. For purposes of display, however, we found that it was confusing and really not necessary to attempt to display the indicators in five separate phases. Rather what we did was to combine those into the two general phase types of operations and shutdown, as shown on this slide. This is what you will see in the new report.

MR. MICHELSON: What is pre-refueling? Is that just before you open the head or is that as soon as you start coming down in power?

MR. HICKMAN: Pre-refueling is the last 25 days of operations prior to the start of the refueling outage. There are some plants where an attempt is made to get ahead of the refueling outage by starting activities early. We felt that we might monitor that and see if we see any problems because of that. There aren't many plants doing that but there are some.

MR. MICHELSON: The folklore in the business is that things don't happen when you are running at a nice

steady state; they happen when you are coming up or coming down.

MR. CARROLL: What he's saying, Carl, is sometimes you want to get a jump on the refueling outage and you do some things that do have a risk of causing a trip. If you are going to overhaul all your condensate pumps, you may do one of them before the outage.

MR. MICHELSON: That part didn't bother me. I just wanted to make sure I understood what pre-refueling meant.

Isn't it important to kind of look at if there is any difference between changing the state of the reactor and running it steady state? You don't have any category here where you are changing the state, cooling down and so forth. Pre-refueling might be deferred to cover that but not in the same way, because it covers a 25-day period and not the time during which you are cooling down. Cooldown is only a couple of days.

MR. HICKMAN: One of the constraints that we have is being able to identify the phases.

MR. MICHELSON: Yes. You may not have enough information to be that finite. Usually in an LER they will tell you if they were on the way down when this happened. If they were cooling down, for instance. A lot of things happen when you cool down. I don't know if that's folklore.

When I read LERs I find a lot of things are happening, just like transients.

MR. CARROLL: Cooling down would be enveloped by the refueling outage.

MR. MICHELSON: That's true, but it's a 25-day period and you're cooling down only a couple days of that.

MR. CARROLL: No.

MR. HICKMAN: The refueling outage is the length of the outage.

MR. MICHELSON: But you are losing the data during the change in thermal conditions.

MR. HICKMAN: The one phase in here that I feel would be desirable to divide further if we could would be the refueling phase, because they go through a lot of different activities during that time. The problem right now is we don't have the data in order to do that.

MR. DAVIS: What is your source of data during shutdown? Is it only LERs?

MR. HICKMAN: Right now we primarily use the morning status report that the op center gets. It calls each licensee and gets their status. That gives us within 24 hours of when they have shut down.

MR. DAVIS: Is that a consistent reporting procedure across all plants?

MR. HICKMAN: Yes. The op center calls every

plant. It starts at four o'clock in the morning and gets the status of each plant.

MR. DAVIS: Thank you.

MR. MICHELSON: Are you storing those in a computer and reading them back later?

MR. HICKMAN: Yes.

MR. MICHELSON: They would tell you if they are cooling down.

MR. CARROLL: If you would like to see that, Pete, it is Bulletin 4 on the ACRS bulletin board.

MR. DAVIS: I don't have access to that.

[Slide.]

MR. HICKMAN: These are some of the new calculational methods that we use.

We determine trends for each individual plant using a linear regression.

For comparison of a plant to its peer group, which we have called deviations, we use the median of the peer group for comparison purposes rather than the mean. This is because the data are not normally distributed, and therefore the median is more representative of the group value than the mean is.

MR. LEWIS: I'm sorry. That was a comment I can't let go by.

MR. WILKINS: That's all right. You go ahead and

say it.

MR. LEWIS: I will stipulate a dissent from that generalization. It's wrong.

MR. WILKINS: Your word "therefore" is quite inappropriate. But please continue.

MR. LEWIS: If as you go on you really depend on that, then we will come back to this.

MR. HICKMAN: We determined the statistical significance of the calculated trends and deviations using a Monte Carlo simulation technique.

It's important to point out that we did not expect when we undertook this effort that would see major changes in many plants. We recognize that this is not going to be some whole new revelation that we've never seen before. We expect, however, to see improved representation of plant performance by using these methods in approximately 15 to 20 percent of the plants, primarily those that are involved with changing from operations to a refueling or some type of extended outage.

MR. LEWIS: Do you mean something technical by the words "statistical significance" or is this an eyeballing operation? What do you calculate?

MR. HICKMAN: We calculate the probability that an observed sequence of events, an observed pattern, if you will, is random.

MR. LEWIS: How can you do that if you are using the median as the norm? You don't have an a priori statistical distribution based on the median if the data are not normally distributed. So what formula can you use?

MR. HICKMAN: For the median we use a binomial distribution.

MR. LEWIS: I understand that, but what formula do you use to calculate the probability that the observed data might have occurred as a random occurrence from a median unless you have presupposed a distribution? You are presupposing the binomial distribution, not the normal distribution. Is that what is going on?

MS. GRADY: I'm Bennett Grady with AEOD staff. I've also served as a statistical consultant.

As shown on the last bullet there, we used Monte Carlo simulation to develop tables that would compute these P values.

MR. LEWIS: For a Monte Carlo simulation you have to insert a model. What model do you use?

MS. GRADY: The model that we use, as Don told you, is a binomial distribution.

MR. LEWIS: The binomial distribution requires that you specify in advance a mean.

MS. GRADY: It requires a probability of observing a particular event.

MR. LEWIS: That's correct. How do you find that probability to use?

MS. GRADY: We have two different simulations, depending on whether we are computing the deviations or --

MR. LEWIS: No. When you use the word "random" you have to have a model for your random distribution.

MS. GRADY: Yes.

MR. LEWIS: I'm trying to understand. The model you are using is the binomial distribution.

MS. GRADY: Yes.

MR. LEWIS: I have no problem with that. But in the binomial distribution there is a parameter which you can call P or whatever it is. Where does that come from?

MS. GRADY: Let's take the deviations from the peer group. We assume that the events in the peer group all have the same probability of occurring. If we observe the event, then the probability of P for the binomial distribution is one over the number of plants within the peer group.

MR. LEWIS: Fine. If you use the peer group, you are using the median of the peer group and inserting that for the P in the binomial distribution?

MS. GRADY: Yes.

MR. LEWIS: That's wrong, of course, because the P in the binomial distribution should be the mean of the peer

group.

MS. GRADY: It's the probability of an event. We've observed a certain number of events during this period.

MR. LEWIS: I understand. In order to infer the P that you put into the binomial distribution the formally correct way is to infer it from the mean of the peer group if you are using it as sort of an empirical binomial distribution simulation. I don't understand how the median gives you that information.

MR. HICKMAN: Bennett, we don't use the median in that determination, do we?

MS. GRADY: No. We are looking at rates and we observed a number of events over a number of times. In that sense it is a mean.

MR. LEWIS: Then I don't know where the median comes from, because it says here deviations from peer group median.

MS. GRADY: The median is used in calculating what is on the display.

MR. LEWIS: The simulations you are running are binomial based on the mean?

MS. GRADY: Right.

MR. LEWIS: Okay. That's correct. Then the statistical significance is based on the distribution of

actual events around the mean as determined using the binomial distribution to get the a priori probabilities of the numbers of events.

MS. GRADY: That is correct.

MR. LEWIS: That's a legitimate procedure if you have enough data. Thank you. I understand. So the median is simply a red herring up there.

MR. HICKMAN: There are two different things we are talking about here. One is to get the value for the plant's deviation from the peer group. For that calculation we are looking at the median of the peer group and comparing it to median value for the peer group compared to the value that the plant had, and that will determine its deviation from the peer group. When we calculate the statistical significance we use the binomial distribution, as was just explained.

MR. LEWIS: But then you are calculating the statistical significance of something that is different from what appears earlier on the slide. You are doing two completely independent things and they are not related.

MR. WILKINS: They're related a little bit. If you can trust the binomial distribution, then they are related.

MR. LEWIS: That's a different level of questioning. I'm stipulating that just to try to get on

with the show.

MR. WILKINS: It obviously is your judgment that seven units is large enough so that you get meaningful statistics.

MR. LEWIS: It's not my judgment.

MR. WILKINS: I mean it is their judgment.

MR. HICKMAN: Yes.

MR. LEWIS: I'm trying to understand what they have done.

MR. SHEWMON: Are you addressing this to Hal or the speaker?

MR. WILKINS: I'm actually addressing it to the speaker.

MR. LEWIS: But he's doing it past me.

MR. WILKINS: I can't look at the speaker without Hal seeing me.

MR. HICKMAN: Seven is the minimum group size that we want to use. We are kind of constrained to do that because of the B&W group. It really doesn't go much with any other plants. While there may be problems with it, we feel that in the evaluation process we can sort out those problems.

MR. WILKINS: In my judgment, the probability that what you see is due to random events rather than to something real will be higher in the smaller peer groups

than it will be in the larger peer groups, and you must be aware of that. I assume that you are. The last speaker certainly indicated some awareness of statistical theory.

MR. LEWIS: This is addressed to Ernest, not to the speaker, although you can eavesdrop. When they calculate statistical significance, presumably -- correct me if I'm wrong -- they are going to calculate a priori probabilities based on the binomial distribution, multiply them together for all the events that occurred, and for a small enough number that's a very shaky way to find what is called statistical significance.

MR. WILKINS: I think so.

MR. LEWIS: We agree on that. But that's another level of conversation.

[Slide.]

MR. HICKMAN: This shows the quarterly data from the current performance indicator report.

Some things to point out here. You notice that we display eight quarters of data for each performance indicator. This dotted line represents the critical hours for the quarter.

In this case we can see that zero critical hours in the third quarter of 1992 indicates that the plant was shut down the entire quarter.

These values in here indicate that it was shut

down for some period of time, and we don't really know how long.

You will see that we have for each plant the dark line which represents a six quarter moving average of the value of the individual indicator, and the cause codes we show only those six quarter moving averages. We do not show the value of the cause code itself because of the concern of comparing plants inappropriately.

[Slide.]

MR. HICKMAN: This is the same page from the draft proposed report. In this case we no longer have that critical hour line. We show a time line which indicates time in operations, time in shutdown, and the letter "R" indicates a refueling outage.

MR. MICHELSON: Excuse me for a moment. Back on your previous slide you showed equipment failure as essentially unchanging. I wasn't quite sure what that block in the lower left-hand corner of the previous slide was really telling me. What is that telling me?

[Slide.]

MR. HICKMAN: Equipment failures is kind of like a catch-all category. It's only used for random failures of electronic equipment and external events, and typically the value is zero.

MR. MICHELSON: Those values are low. The

unvarying is the part that puzzled me a little bit.

MR. HICKMAN: That means that they have been zero for quite while.

MR. MICHELSON: I don't know if that was zero or not. Is that a zero there?

MR. HICKMAN: By the old method you couldn't tell.

MR. MICHELSON: It looks like a finite value. It's not at the bottom.

MR. HICKMAN: The performance indicator report is divided into two parts. These graphs are in part 1 and this was done this way to make it more difficult for people to flip pages and look at two plants and try to compare their cause codes.

MR. MICHELSON: I was only puzzled about why it's a flat line. Is there some simple explanation?

MR. BARANOWSKY: It's probably zero and this presentation is an obfuscation of the information.

MR. MICHELSON: Is that a zero in the middle of the graph?

MR. HICKMAN: No. In part 2 the data are all tabulated. You can go see if they are actually zero. In this case the plant has had zero equipment failures for many quarters and therefore the six quarter moving average has stayed at zero.

MR. MICHELSON: I just would have intuitively

expected it to be at the bottom, a black line, just like you put zeros up in that second block.

MR. HICKMAN: Right. This was intentionally done.

MR. MICHELSON: There is a finite number of failures but they are apparently very constant.

MR. BARANOWSKY: We were told not to be able to compare plants, and so we had to present it this way.

MR. WILKINS: I am impressed by the willingness of the Staff to concede that they are deliberately obfuscating something in response to orders. I understand.

MR. CARROLL: But not anymore. Flip the page.

MR. HICKMAN: I want to clarify one thing just so there is not any misunderstanding. Equipment failures are not capturing every piece of equipment that fails. There are many of those. Those are going to have some other cause.

MR. MICHELSON: That wasn't even the point.

[Slide.]

MR. HICKMAN: You'll see here that we show stack bars now shaded to indicate the phase in which the event occurred. While we calculate only for operations and shutdown, we also indicate events that occurred in startup because those are of special concern to us.

The forced outage rate, the equipment forced outages and the radiation exposure are not differentiated by

phase type because they are not a function of phase type.

Now we show the cause code actual numbers here.

MR. MICHELSON: Does that mean there were no miscellaneous causes during that period?

MR. HICKMAN: None. We changed equipment failure to miscellaneous because it was misleading, and there were no failures during that entire three-year period.

Another point to bring out. We show 12 quarters of data rather than just eight.

MR. LINDBLAD: Excuse me. I recognize that this will be reviewed mostly by people who are knowledgeable and the like, but it kind of troubles me to see a reactor vendor identified as the peer group and then the equipment forced outages down below, which I suspect are generally not reactor equipment so much as balance of plant equipment and the like. The grouping before was talking about plant generally, but so many of the other numbers are associated directly with reactor equipment. I think that the reactor vendor may be getting a bad rap if the balance of plant equipment is shown to be performing poorly. Was there any other alternative as to how to describe those plants?

MR. HICKMAN: We looked at a lot of other ways to group plants.

MR. DAVIS: You could do it by A-E, for example.

MR. HICKMAN: That was one consideration. If you

are looking at scrams, you might want to look at types of feedwater systems. The problems with those are that there are so many variations on that that the peer groups wind up being very small.

MR. LINDBLAD: How about in equipment forced outages if you were discriminating in what kind of equipment it was? Can you discriminate between reactor equipment and balance of plant equipment?

MR. HICKMAN: The indicator does not, but in monthly operating reports we get information on outages, and in LERs we will find out if it was forced shutdown.

MR. LINDBLAD: Thank you.

MR. CARROLL: The industry average line is ror all BWRs and PWRs?

MR. HICKMAN: The entire industry, yes, sir. There is also the peer group line on there. Those are the linear regressions.

[Slide.]

MR. HICKMAN: I have provided an expanded view, a blowup of just one of the indicators to show the difference between the two. By the old method we had eight quarters of data. You will see there one safety system actuation in the third quarter of 1992.

When we come down to the new method, we can see that that safety system actuation occurred during shutdown.

If you look at the LER, sure enough, that was associated with surveillance activities being done during the shutdown.

By showing 12 quarters of data we also go back a little bit further and show a second safety system actuation immediately prior to the time period shown on the top curve.

We can use this time line to see the plant mode when some of these events occurred. So it provides a better picture for us of exactly what is going on at the plant.

[Slide.]

MR. HICKMAN: In part 1 of the report there are two pages. The quarterly data we just talked about. This is the trends and deviations page and this shows the currently approved method of displaying trends and deviations.

We noted that by the old method we would have looked at that safety system actuation and made no distinction between the phase of operation. So we would have taken that actuation, compared it with the performance immediately prior to that where there were no actuations, and we would have shown a declining trend. I want to show you how that is different by the new method.

[Slide.]

MR. HICKMAN: Here are the trends and deviations calculated by our proposed method. Since that safety system

actuation occurred during shutdown, it will not appear in the operations section and will show no trend in safety system actuations. They were zero for the period of time that we looked at them.

Instead, that safety system actuation will be shown in the shutdown section. What we find is that by comparing that outage period with the previous outage period in fact there is an improvement there. If you look back to the previous outage, they had more safety system actuations. So in outage performance they have improved; in operations there is no trend.

We also indicate on here the statistical significance. Black is a high probability that the pattern of events we've seen is not random. Gray is medium and the white is low. We can look at this graph and use those shadings to help us evaluate licensee performance.

MR. CARROLL: What does high, low and medium mean?

MR. HICKMAN: They are cutoffs in the value of the probability.

MR. CARROLL: And the report states what those cutoffs are?

MR. HICKMAN: Yes.

This allows us to discount those bars that are shaded white, to apply more weighting to those that are gray and more weighting to those that are black.

There was some mention earlier about programmatic cause codes and how we use this. I can get into that if the Committee has time to do that. This concludes what I have prepared.

MR. SEALE: Could I make a qualitative comparison?

MR. HICKMAN: Yes. Please do.

MR. SEALE: In looking at your two thermometers here, the one on the left, it's good to be to the right.

MR. HICKMAN: Yes.

MR. SEALE: The one on the right, it's good to be to the left.

MR. HICKMAN: We are still working on the terminology. In every case to the right is good and to the left is bad. We tried some different terms. What we mean here is that this is below average performance as opposed to below the median.

MR. SEALE: So it's performance deviation.

MR. HICKMAN: Yes.

MR. WILKINS: The fact that a man as capable and shrewd as Mr. Seale could fall into that trap means you really ought to give some thought to the language you are using.

MR. HICKMAN: You're right. We've tried five different things, sir. You're correct in that observation.

If there are no other questions, that concludes

what I have prepared.

MR. SHEWMON: We are just about on schedule. Thank you very much.

MR. DAVIS: Do we have time for one comment?

MR. SHEWMON: Sure.

MR. DAVIS: As almost everyone knows by now, there is a considerable interest in shutdown risk evaluations. To follow up a little on what Carl Michelson brought up earlier, there are two rather significant efforts under way at Brookhaven and Sandia to look at shutdown risks. Those efforts have come to the conclusion that it's appropriate to divide refueling outages into a rather large number of operating states which were selected on the basis that the plant goes through several configurations during the refueling outage procedure and that in each configuration the plant has a different vulnerability to certain failures. I think for the BWR they are looking at it is like 13 operating states and for the PWR it's ten or 11. I don't remember the numbers exactly but it's on that order.

The problem when you do that is that you need to have a lot of data for each of these states in order to estimate the probability of a core damage accident.

It might be worthwhile to consider taking a look at what they have done in these studies and see if there is some way you can cut your data to be consistent with the

needs for each of these operating states. I realize it's a difficult proposition, but I think eventually there is going to be a lot more done in the way of calculating risk during shutdown, and this kind of data is going to be desperately needed to handle that.

Just a suggestion.

MR. CARROLL: Why is this data particularly useful for that purpose? I don't see why you feel this kind of information is that useful for these shutdown risk PRAs.

MR. DAVIS: I think it should be if they are looking at what equipment is out during certain phases of the shutdown process.

MR. CARROLL: That's available from other things besides this.

MR. DAVIS: It was difficult to get in these two programs.

MR. NOVAK: Let me make two comments. One, even to do what we have done has taken quite a bit of time. If you were to take, for example, a Westinghouse designed plant, and let's say there was a period during shutdown when they were in mid-loop operation. To track that kind of data so that you could go back to say, well, in the previous refueling when they were at mid-loop operation did they have an event, we would be really stretching our ability to track all that data. This is just a step improvement.

But to go back to your point, remember, we also use the accident sequence precursor program. So when we do have an event where during mid-loop operation for this plant they run into trouble, we will analyze that event. So kind of on a separate track we do look at the risk that we might perceive from some of these events.

This is a screening tool to look at the dozen plants out of a hundred that we might want to begin to look at more carefully. That's the kind of thing this has attempted to do. It's one tool.

MR. DAVIS: I appreciate that, Tom. Of course it's more than just events. You also need to have the availability of equipment during these shutdown operating states, because you are going to postulate the occurrence of an event. Just a thought.

MR. CARROLL: One comment I might make is I know a number of us are on the distribution for these quarterly reports. They are available if others want to get on the distribution. I'm sure Mr. Igne can arrange for that.

Thank you. Good presentation.

MR. SHEWMON: Gentlemen, I would like to now go on to Charlie's letter on Generic Safety Issue 120.

We will go off the record.

[Whereupon at 9:30 a.m. the recorded portion of the meeting was concluded.]

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: 393rd ACRS Meeting

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.

Michael Paulus

Official Reporter
Ann Riley & Associates, Ltd.

AEOD STAFF PRESENTATION TO THE
ACRS

SUBJECT: PROPOSED ENHANCEMENTS TO PERFORMANCE INDICATOR REPORTS

DATE: JANUARY 8, 1993

PRESENTERS: PAT BARANOWSKY, BRANCH CHIEF

DON HICKMAN, SECTION CHIEF

BR/DIV: TRENDS AND PATTERNS BRANCH

DIVISION OF SAFETY PROGRAMS

TELEPHONE: 492-4480

492-4431

PERFORMANCE INDICATOR PROGRAM
INTRODUCTION

- SINGLE PROGRAM UNDER AEOD
- QUARTERLY REPORTS SINCE 1987
- COMMISSION APPROVES INDICATORS
- RESTRICTIONS ON THEIR USE

PERFORMANCE INDICATORS

- AUTOMATIC SCRAMS WHILE CRITICAL
- SAFETY SYSTEM ACTUATIONS
- SIGNIFICANT EVENTS
- SAFETY SYSTEM FAILURES
- FORCED OUTAGE RATE
- EQUIPMENT FORCED OUTAGES PER 1000 CRITICAL HOURS
- COLLECTIVE RADIATION EXPOSURE
- CAUSE CODES

CAUSE CODES

- ADMINISTRATIVE CONTROL PROBLEMS
- LICENSED OPERATOR ERRORS
- OTHER PERSONNEL ERRORS
- MAINTENANCE PROBLEMS
- DESIGN, CONSTRUCTION, INSTALLATION OR FABRICATION PROBLEMS
- MISCELLANEOUS FAILURES

BACKGROUND
THE USE OF PEER GROUPS

- "CAUSE CODES" IDENTIFY PROGRAMMATIC CAUSES OF EACH REPORTABLE EVENT
- COMMISSION APPROVED TRENDING OF "CAUSE CODES" FOR EACH PLANT
- DIRECTED DEVELOPMENT OF PEER GROUPS FOR COMPARISON OF "CAUSE CODES"

BACKGROUND
THE EFFECT OF OPERATING CYCLES

- "CAUSE CODE" DATA CYCLIC WITH REFUELING INTERVAL
- OPERATING MODE AFFECTS RATE OF REPORTABLE EVENTS
- EVENT TYPES VARY WITH OPERATING MODE

ENHANCEMENT SUMMARY

- INDICATORS FOR BOTH OPS AND SHUTDOWN
- INDICATORS RELATIVE TO SIMILAR PLANTS
- STATISTICAL SIGNIFICANCE OF INDICATORS

DEVELOPMENT PROGRAM

- PEER GROUPS - INEL

- OPERATING CYCLE PHASES - ORNL

- CALCULATIONAL AND DISPLAY METHODS - BOTH

- TRIAL PERIOD - INTEROFFICE TASK GROUP

PEER GROUP FACTORS

- DESIGN
  - NSSS VENDOR
  - PRODUCT LINE
  - GENERATING CAPACITY
  - AGE
- REGULATORY ISSUES
  - TYPE OF TECH SPECS
  - TMI BACKFITS
  - LICENSING DATE
- MINIMUM GROUP SIZE
- INPUT FROM OWNERS' GROUPS

PEER GROUPS

- ALL B&W PLANTS
- CE PLANTS W/O CPC
- CE PLANTS W/CPC
- PRE-TMI GE PLANTS
- POST-TMI GE PLANTS
- SMALL WESTINGHOUSE PLANTS
- OLD 3 LOOP WESTINGHOUSE PLANTS
- OLD 4 LOOP WESTINGHOUSE PLANTS
- NEW 3 AND 4 LOOP WESTINGHOUSE PLANTS

OPERATING PHASE BASIS

- CHANGES IN RATE OF REPORTABLE EVENTS WERE OBSERVED
- REPORTABLE EVENTS VARY WITH PLANT ACTIVITIES
- PLANT ACTIVITIES CHANGE WITH OPERATING PHASE
- IDENTIFY PHASES IN WHICH PLANT ACTIVITIES VARY SIGNIFICANTLY

OPERATING CYCLE PHASES

- FIVE PHASES
  - STARTUP
  - POWER OPERATIONS
  - PRE-REFUELING
  - REFUELING OUTAGE
  - NON-REFUELING OUTAGES

- TWO PHASE TYPES
  - OPERATIONS
    (STARTUP, POWER OPS, PRE-REFUELING)
  - SHUTDOWN
    (REFUELING AND NON-REFUELING OUTAGES)

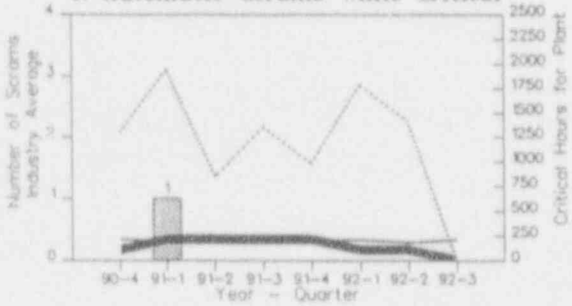
CALCULATIONAL METHODS

- TRENDS FROM LINEAR REGRESSIONS
- DEVIATIONS FROM PEER GROUP MEDIAN
- SCALED FOR COMPARABILITY
- STATISTICAL SIGNIFICANCE FROM MONTE CARLO SIMULATION

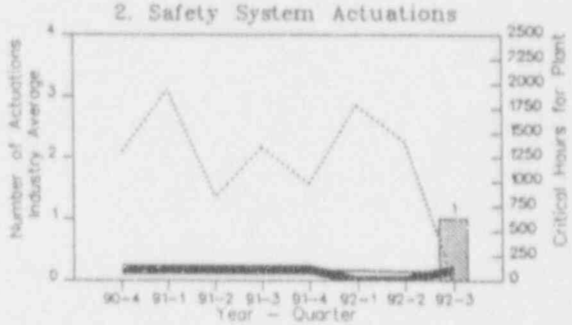
90-4 to 92-3 QUARTERLY DATA

Legend:
- Indicator
- Older Plant 6 Qtr Moving Average
- Critical Hours
- Plant 6 Quarter Moving Average (Long Term Trends)

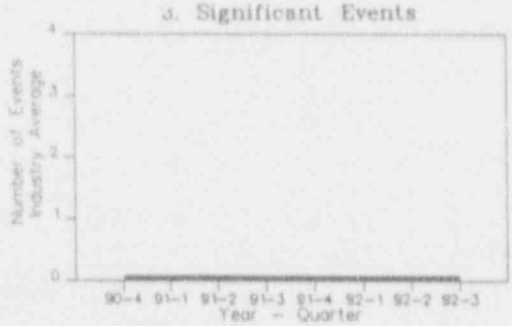
1. Automatic Scrams While Critical



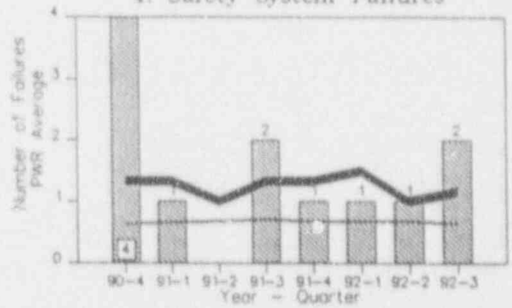
2. Safety System Actuations



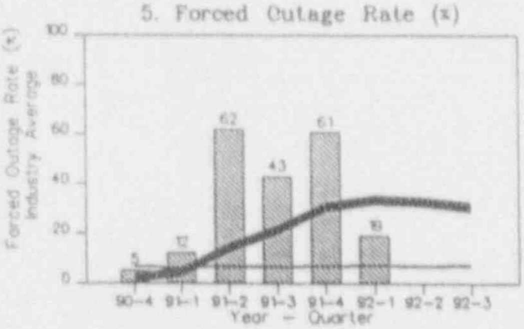
3. Significant Events



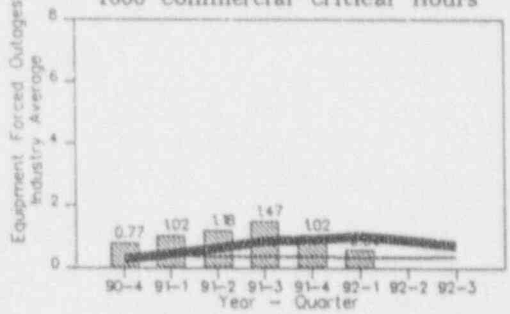
4. Safety System Failures



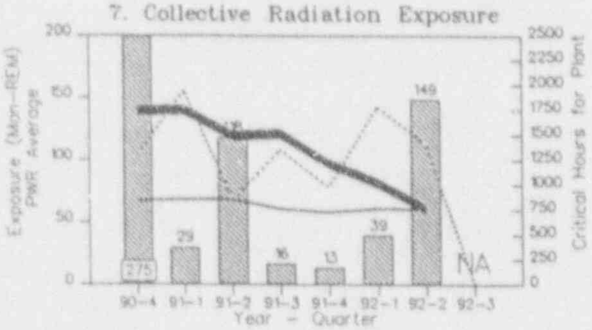
5. Forced Outage Rate (%)



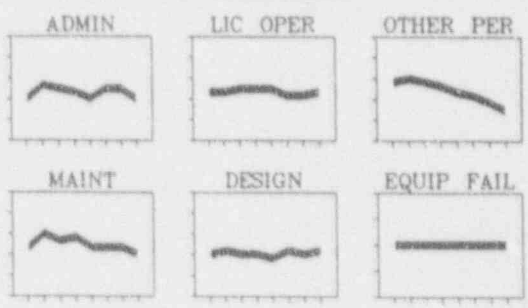
6. Equipment Forced Outages/ 1000 Commercial Critical Hours



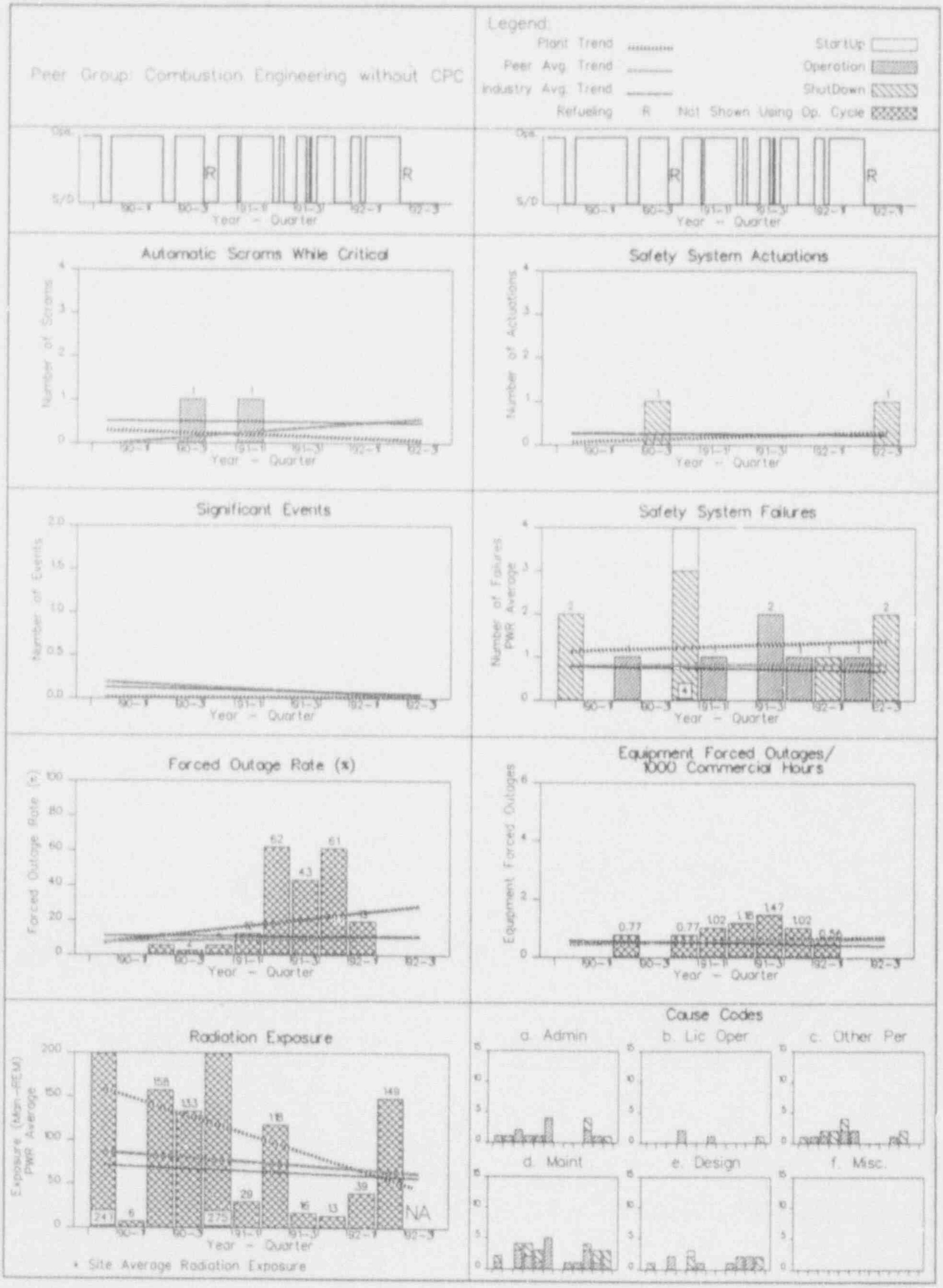
7. Collective Radiation Exposure

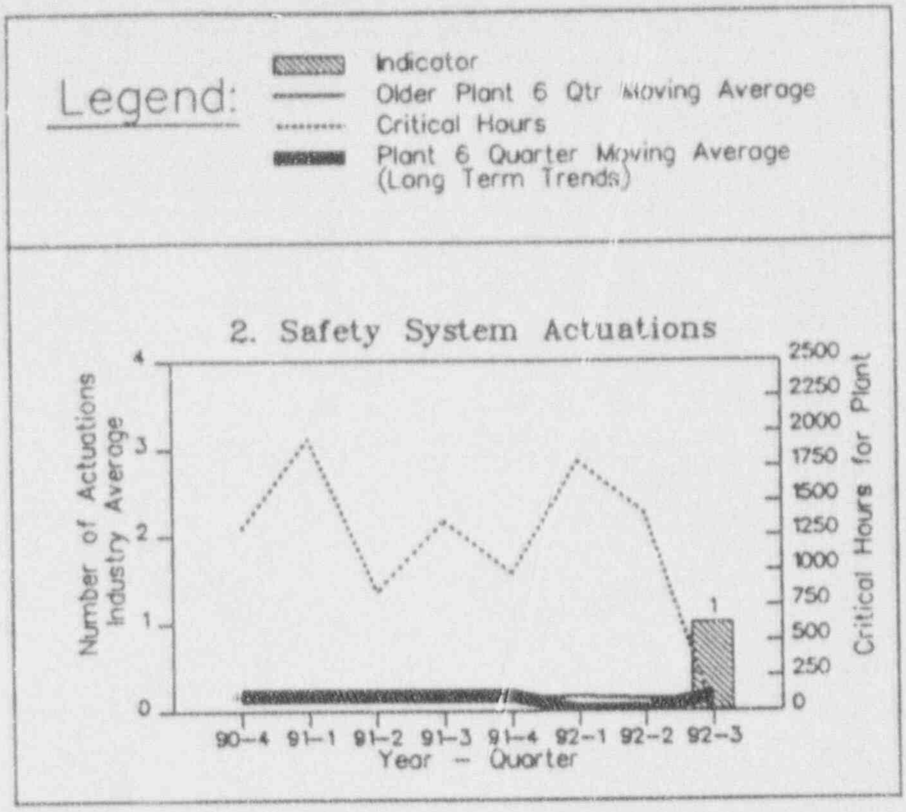


8. Cause Codes

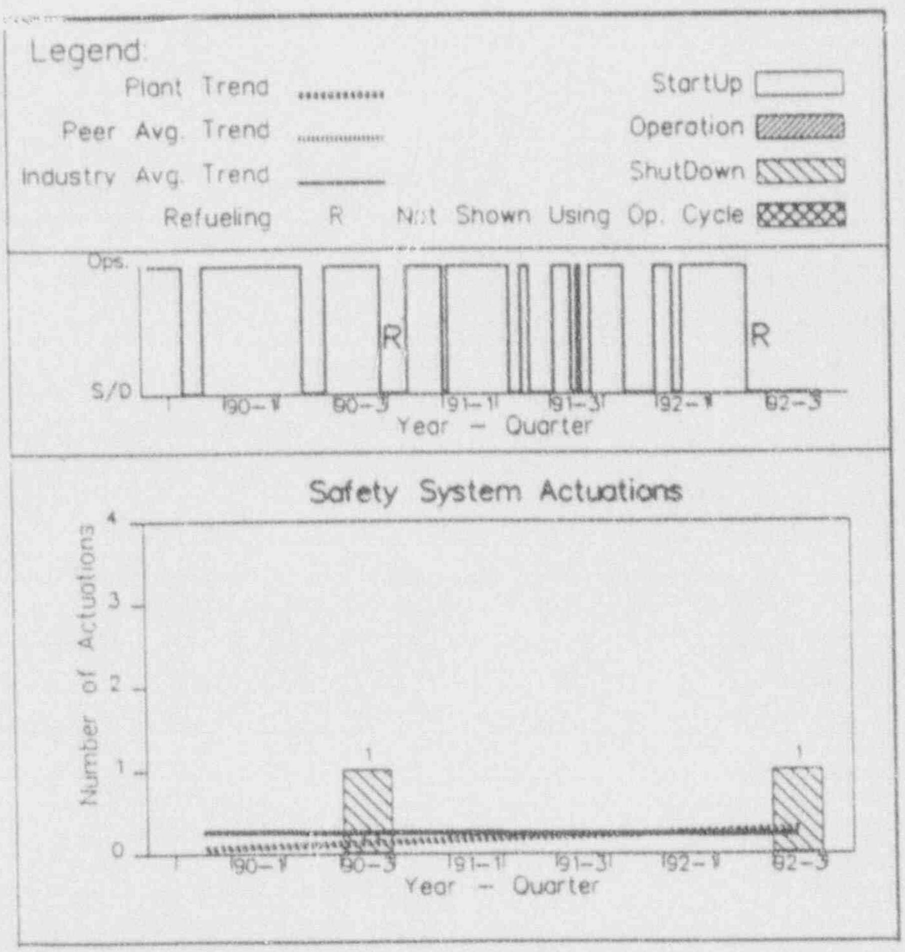


Third Quarter 1992 Quarterly Data

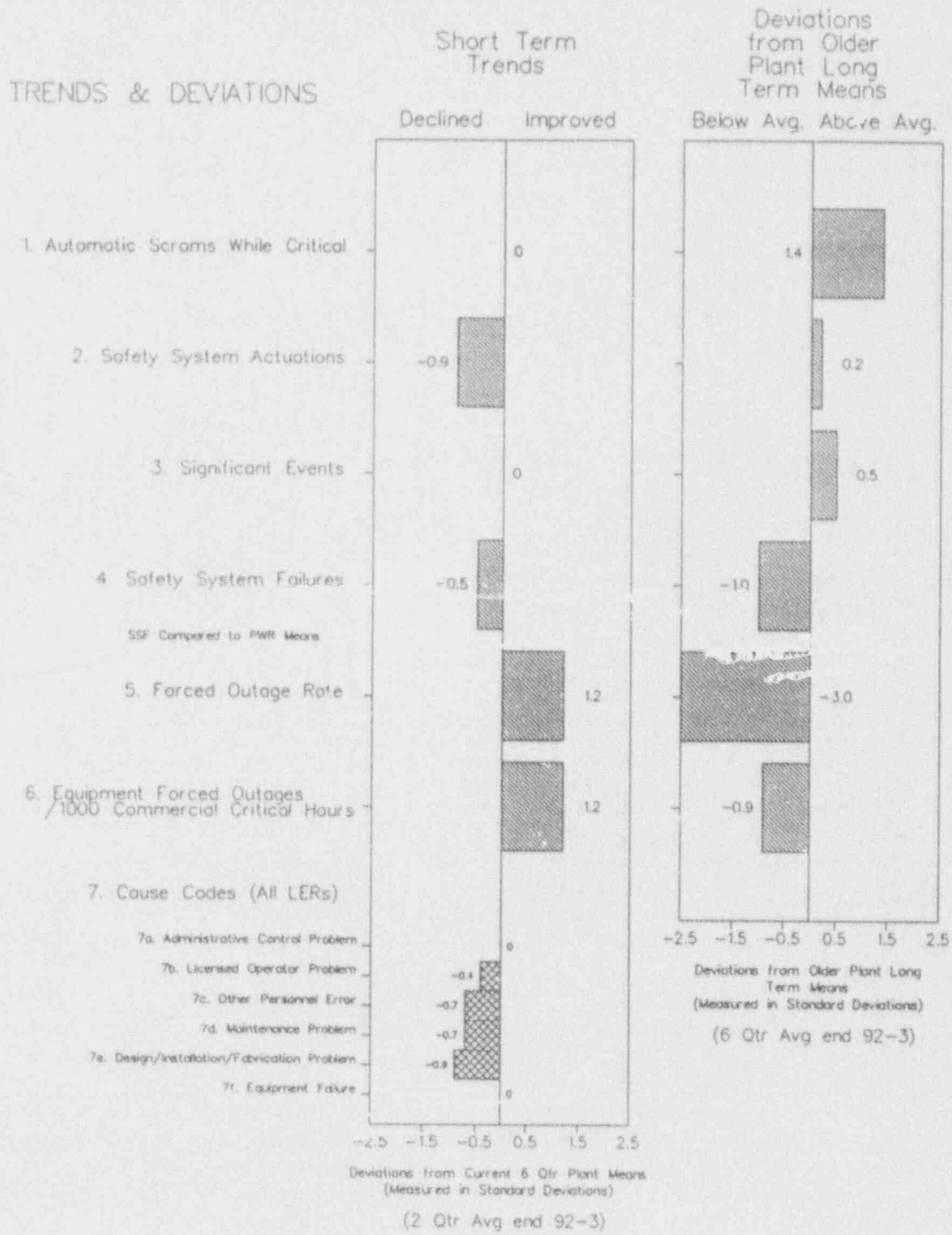




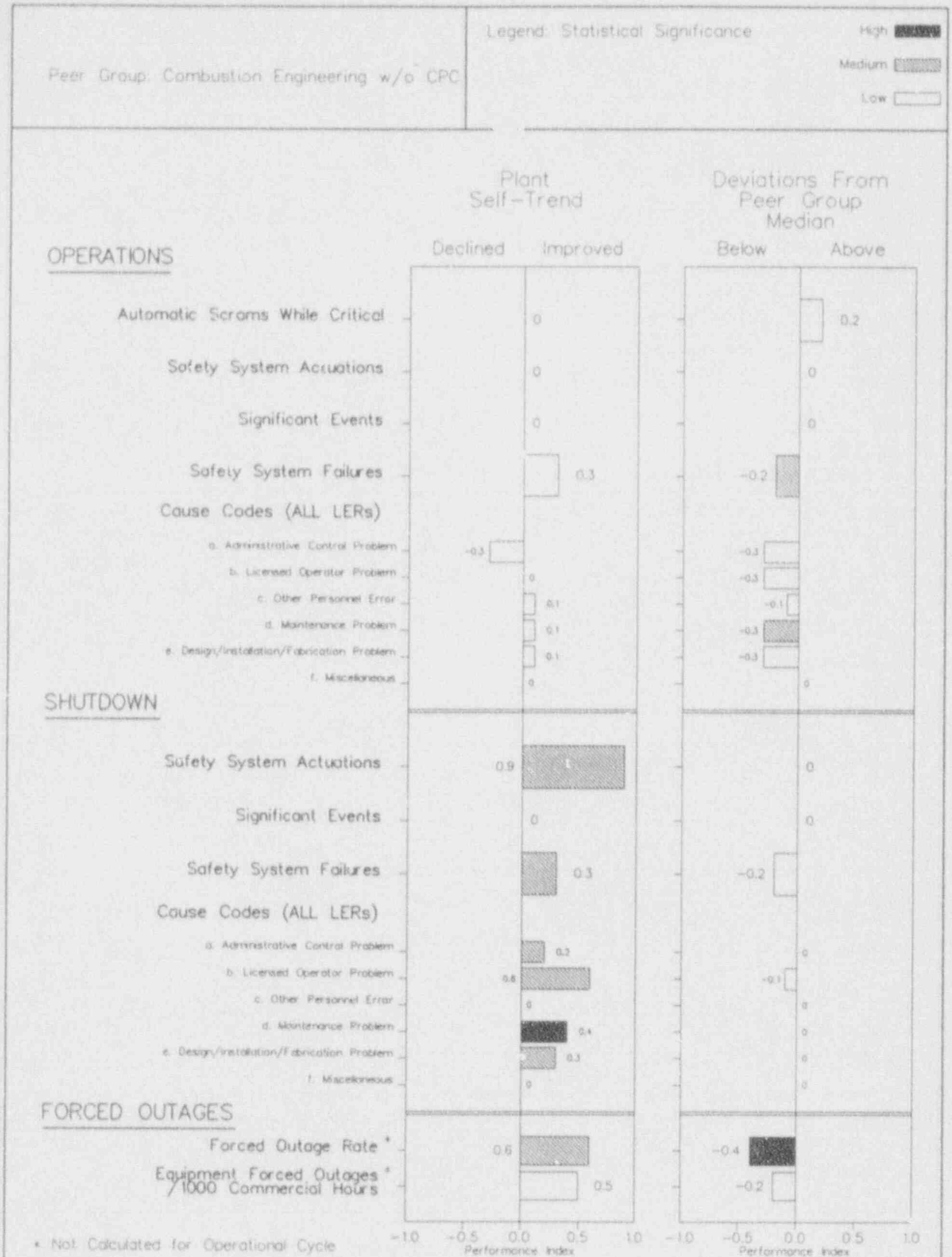
Legend:
Indicator
Older Plant 6 Qtr Moving Average
Critical Hours
Plant 6 Quarter Moving Average (Long Term Trends)
2. Safety System Actuations
Number of Actuations Industry Average
Critical Hours for Plant
0 1 2 3 4
0 250 500 750 1000 1250 1500 1750 2000 2250 2500
1
90-4 91-1 91-2 91-3 91-4 92-1 92-2 92-3
Year - Quarter



Legend:
Plant Trend
Peer Avg. Trend
Industry Avg. Trend
Refueling R Not Shown Using Op. Cycle
StartUp
Operation
ShutDown
Ops.
S/D
R
R
90-1 90-3 91-1 91-3 92-1 92-3
Year - Quarter
Safety System Actuations
Number of Actuations
0 1 2 3 4
1
1
90-1 90-3 91-1 91-3 92-1 92-3
Year - Quarter


TRENDS & DEVIATIONS
Short Term Trends
Declined
Improved
Deviations from Older Plant Long Term Means
Below Avg.
Above Avg.
1. Automatic Scrams While Critical
0
1.4
2. Safety System Actuations
-0.9
0.2
3. Significant Events
0
0.5
4. Safety System Failures
-0.5
-1.0
SSF Compared to PWR Means
5. Forced Outage Rate
1.2
-3.0
6. Equipment Forced Outages /1000 Commercial Critical Hours
1.2
-0.9
7. Cause Codes (All LERs)
7a. Administrative Control Problem
0
7b. Licensed Operator Problem
-0.4
7c. Other Personnel Error
-0.7
7d. Maintenance Problem
-0.7
7e. Design/Installation/Fabrication Problem
-0.9
7f. Equipment Failure
0
-2.5 -1.5 -0.5 0.5 1.5 2.5
Deviations from Current 6 Qtr Plant Means (Measured in Standard Deviations)
(2 Qtr Avg end 92-3)
-2.5 -1.5 -0.5 0.5 1.5 2.5
Deviations from Older Plant Long Term Means (Measured in Standard Deviations)
(6 Qtr Avg end 92-3)

Third Quarter 1992 Trends and Deviations



* Not Calculated for Operational Cycle

UNITED STATES NUCLEAR REGULATORY COMMISSION

ANNOUNCEMENT NO. 200

DATE: November 28, 1989

TO: All NRC EMPLOYEES

SUBJECT: REVISED GUIDANCE ON THE USE OF PERFORMANCE INDICATORS

This announcement revises the earlier guidance of NRC Announcement 30, dated February 5, 1988, regarding the use of the results of the NRC Performance Indicator Program. All NRC employees shall adhere to the following guidance.

The Performance Indicator Program provides an additional view of operational performance and enhances our ability to recognize areas of poor and/or declining safety performance of operating plants. However, it is only a tool and is to be used in conjunction with other tools, such as the results of routine and special inspections and the systematic assessment of licensee performance (SALP) program, for providing input to NRC management decisions regarding the need to adjust plant-specific regulatory programs.

It should be recognized that performance indicators have limitations and are subject to misinterpretation. Therefore, caution is warranted in the interpretation and use of the data. The application of performance indicators for purposes and in manners other than those stated above will be counter to the NRC objective of ensuring operational safety. To avoid such situations, the following specific directives are provided:

1. The Performance Indicator Program for operating reactors is a single, coordinated, overall NRC program under the direction of AEOD. NRC offices other than AEOD should not deviate from the NRC program without written permission of the EDO or the Director, AEOD.

2. Performance indicators are intended as a tool for senior NRC management to monitor trends in overall performance for a given plant. The performance indicators for a given plant should be viewed as a set. When viewed as a set, the performance indicators provide an additional measure of plant operational performance. However, they should not be used in communications with licensees as a measure of performance level.

3. Performance indicators are intended to be one of several tools for use by senior NRC management in decision-making regarding plant-specific regulatory programs. Senior management in each NRC office should have access to performance indicators for their assigned unit(s). Performance indicators are not to be overemphasized in relation to other measures of safety performance. For this reason, no regulatory action should be taken on the basis of Performance Indicator Program results alone.

4. Performance indicators do not provide a valid basis for ranking individual nuclear power plants and should not be presented in such a way as to imply "problem facility" status for individual plants.

5. The Performance Indicator Program is separate and distinct from the SALP program, although it is recognized that the indicators have relationships in varying degrees to SALP functional areas. Indicators, such as failures of a plant's safety systems or frequent forced outages due to equipment failures, may be symptomatic of safety problems. Thus, the staff may recognize events and failures captured by certain indicators in SALP discussions and reports, but these SALP references are to be based on the underlying causes of poor performance and not on the results of the Performance Indicator Program, either individually or as a set. Regional Administrators should ensure that our decision-making process adheres to this guidance, especially in SALP discussions and documentation.

6. NRC senior management should bear in mind when evaluating performance indicator results that the indicators are assessment tools that aid in identification of unanticipated performance, and that the underlying causes should be carefully assessed, evaluated, and understood (factoring in other available information).

7. Quarterly compilations of Performance Indicator Program results should be placed in the Public Document Room following dissemination to NRC management and the Commission.

It should be recognized that in conducting reviews, inspections, and evaluations of plants, it is often necessary to rely on plant data. Such information has been routinely used in our SALP, safety evaluation reports, and technical evaluation reports. The foregoing policy is not intended to change this process.

NRC staff must be sensitive to inappropriate pressure from any source which causes licensee personnel at individual nuclear power plants to "manage the indicators" or to take any actions that are contrary to plant safety because of performance indicators, individually or as a set (such as inhibiting reactor trips). Any such instances should be promptly communicated to appropriate licensee management and brought to NRC management attention.

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for Operations