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NRC

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

PUBLIC MEETING

BRIEFING ON UPGRADE OF OPERATIONS CENTER

(NUCLEAR DATA LINK) (SECY-80-35A)

East-West Towers
Room 550
4530 East-West Highway
Bethesda, Maryland

Thursday, May 15, 1980

The meeting convened, pursuant to notice, at 10:05 a.m.

Present:

JOHN F. AHEARNE, Chairman
JOSEPH M. HENDRIE, Commissioner
VICTOR GILINSKY, Commissioner
PETER A. BRADFORD, Commissioner

Also present:

W. DIRCKS
H. DENTON
V. STELLO
B. WEISS
O.E. BASSET
R.J. BUDNITZ
R. MATTSON
M. HOWARD
L. CROPP, Sandia National Laboratories

PROCEEDINGS

CHAIRMAN AHEARNE: This morning we are going to hear as described in the paper, an update on staff actions regarding a Nuclear Data Link. One of the results of the reviews of the Three Mile Island accident, and reviews of other emergency response actions of the Commission, was to reach a conclusion that better mechanisms ought to be put in place for transferring information from power plants to the NRC.

One of those mechanisms -- a very early mechanism put in place -- was a dedicated telephone line.

For some months, the staff has been working on additional, far more substantial mechanisms for transferring the data, and that was what we were to hear this morning, is where are they in that process. And I would imagine, having read through the papers, there still remain some issues to be resolved, including how do we find the money to pay for this.

Do we find it in the coffers of the utility? What kind of a system ought we to be trying to design?

And then the last item that, at some stage this morning I would like to touch on, is the significance of the recent reprogramming response we got from Mr. Udall.

Bill?

MR. DIRCKS: Well, as you mentioned, this is a brieifng on the current status of the development of the

reports on Nuclear Data Link. We will certainly be able to tell you where we are today.

The whole process started off on the basis that we do need a better supply of data to the agency during emergencies. We built our current thinking on the last session we had with the Commission. You will soon see the roles that we outlined to the Commission last time, the roles of the agency during an emergency, and we took the guidance that we got from that last session and we will show you how the data requirement will meet those two or three major roles that you identified for us.

As we go through it, you will soon see that the essential question that at least exists in my mind -- and I am sure in others -- is how closely this system that we will be requiring for ourselves will be coordinated with the data requirements that the industry will be facing, how much of an effort should we make towards getting the systems somewhere identical, the data that we get, the data parameters, the form that we get it in and the displays we can show it in, and the ways that we handle the data.

This comes down to an essential question in my mind and I think it is shared by many others who sat in on the meetings.

With that as an introduction, I assume that Vic will be picking up the briefing. Is that right?

MR. STELLO: Yes.

(Slide)

What I thought would be appropriate to start with is the definition of the Agency's role in the event of an emergency. There continues to be a question of whether the role, as defined on this slide, is the appropriate role.

The question was raised in the ACRS Review whether the role is or is not yet adequately defined.

You will recall that during our l meeting on this subject when we went through the role, the Commission requested that we develop a data link concept, considering and emphasizing certain elements of the agency role and trying, to the best of our ability, to not allow certain other elements to drive what that role ought to be.

Briefly stated, there is little question that there is a need for the Agency to monitor any emergency that might develop aimed at a concept of understanding that the event itself is understood, the data and the sequence of events are understood and you can articulate, based on that monitoring, what is happening.

There is also agreement that clearly the Agency may be placed in a position to advise that certain protective measures might be needed in the event of an emergency and clearly the most difficult decision that the Agency may have to make is a recommendation to various state and other

agencies to evacuate.

That still remains, even with our discussions with FEMA, as a principal responsibility of our agency, to make that recommendation.

The issues with respect to the last three bullets that are on this slide, that is the need to have sufficient information for whether or not the Agency may decide to order or direct a licensee to take on a different approach in resolving emergencies and directing, in simple terms, starting or stopping the pump, changing the strategy that he is going about in resolving the emergency or whatever.

Those kinds of directives are believed to be things that we may, in fact, need to ask ourselves whether or not we ought to do it. Clearly if we do not do it, that is a decision.

Ultimately, assuming management control comes up as an issue, this, I think, creates a great deal of confusion --

CHAIRMAN AHEARNE: Vic, I guess I am a little puzzled. I thought we went through this discussion and I thought that dotted line indicates where we came out.

MR. STELLO: The dotted line -- and I was going to get to that very quickly -- the dotted line, as I recall, was in deciding the Nuclear Data Link, in trying to decide what it ought to be, draw the dotted line and decide the Nuclear Data Link on the basis of it was above the dotted line.

I was trying to get to the point that the dotted line was used, but it is my judgment it didn't really have a tremendous impact on the requirements that we had set for the Nuclear Data Link.

CHAIRMAN AHEARNE: I wasn't taking exception. I was just saying that I would have thought that you could have shown the slide with the bottom dropped out and just said that, as preliminary, that we did have this previous discussion and the Commission came out that the upper two were the appropriate roles.

MR. STELLO: Should I then conclude the lower three are not?

MR. DIRCKS: Now, this was what I was referring to when I got into it. We did start off with this the last time around and the four -- let's say the top four bullets -- were identified as things the Agency would be faced with in an emergency.

Then we said that the first two, monitoring and advising, let's keep the Data Link basically designed to serve as --

CHAIRMAN AHEARNE: Yes, because those were the functions that we --

MR. DIRCKS: I think we started off, at least in my eyes, that is the role of the Data Link coming in.

CHAIRMAN AHEARNE: Fine.

MR. STELLO: My point being, clearly what you are going to hear in terms of Data Link is designed to deal with those first two bullets, although indeed, dealing with the first two bullets, we will have information that will be useful in deciding the issues relating to the last three.

I wanted to leave this with a question of whether or not some further clarification of what the Agency role is or isn't in light of the ACRS comment.

CHAIRMAN AHEARNE: Well, never mind in light of the ACRS comment. In light of the fact that it did not seem to be clear that the dotted line was very significant. Maybe that is true. At least I thought that we were pretty clear.

COMMISSIONER HENDRIE: It would seem to me.

MR. DIRCKS: I think to make some headway in the meeting today, from my viewpoint anyhow, that dotted line is important to look at the Data Link as we will be discussing it.

CHAIRMAN AHEARNE: Fine. And also important to look at what is the appropriate role of the Agency in all of those aspects.

MR. DIRCKS: Why don't you pick up with the next point?

MR. STELLO: Okay.

The next thing that we want to get into is a discussion of where we are and various alternatives that were

considered, and I'll ask Bernie to make the presentation.

There is one particular alternative that has been studied in detail at Sandia and we are prepared to go into whatever detail in that particular concept.

The others we have looked at. It seems as though they would be worthwhile and it would be obvious as to why.

MR. DENTON: Could I inject a comment here before we look at this?

Having decided the need for Data Link to perform certain functions, it's important that we coordinate this and look at the broader picture of what it means, so we are looking also at what should be displayed in the control room. You remember our discussions on the safety vector and the safety console. On what should be displayed in the on-site center, the off-site center, what the display analytical capability should be. And from a design standpoint, it's important, I think, that we not let the Data Link necessarily drive what's in the control room. And so we are looking at it from really what should be in the control room, what should be in these on- off-site centers and then how do we tie into it in the most effective way.

One way is to require standardization out there. It simplifies our end. The other way is to let everybody meet our requirements, and then we have to have a very flexible system to tie into it, so that you do not focus just on the

Data Link. I think we are really proposing a coordinated program on a schedule where we define all these needs all at the same time, and then everybody can move down the same design path.

COMMISSIONER GILINSKY: Could I just take you back a minute? You referred to the ACRS letter and I wondered what you draw from that letter. How does it bear on the various items in that chart?

MR. STELLO: I will read from the ACRS letter and the comment that I had in mind that they made that prompts me to say what I said.

"Based on our conversation with members of the NRC staff, we do not believe the intended role of the NRC is yet well-defined."

CHAIRMAN AHEARNE: It could have been, "is yet well understood."

MR. STELLO: Or understood.

COMMISSIONER GILINSKY: And therefore what -- I don't remember exactly what you said, but you said in the light of what the ACRS said, therefore we ought to be looking at items below the dotted line, or ought not to be looking --

MR. STELLO: No. It is my belief that the Agency's role is all of what was on the first slide. The first two bullets were emphasized with respect to answering the question of how do you develop a Data Link.

Well, the issue was, develop a Data Link that is adequate to handle the first two bullets.

The question I have, is there still reservation that -- all of what was on the first slide is the Agency role. In my mind, at least, I cannot believe that the Agency role is less than what is on the first slide. I think it is all of it.

But if that is an issue, then I think we ought to get it clarified.

COMMISSIONER GILINSKY: Okay. But the ACRS letter is neither hear nor there on that point. I mean, they are just saying that's what you think, and you're telling us they're telling us --

MR. STELLO: Well, I guess they're telling us --

COMMISSIONER GILINSKY: Well, let's not get into all of this.

MR. STELLO: Yes. They've told you it's not well-defined.

COMMISSIONER GILINSKY: After talking to you.

(Laughter)

COMMISSIONER GILINSKY: Let's go on.

CHAIRMAN AHEARNE: I wonder if we could move on back to this morning's topic.

MR. WEISS: Okay.

(Slide)

MR. WEISS: Thinking we've understood our role, we have decided that we needed somebody to develop the concept and we went to Sandia and tasked them with developing a conceptual approach to the manner in which we can acquire data, transmit the data into headquarters, and even display that data and use that data.

We told them certain things in their design concept. One, the most important one, was to use existing technology. We didn't want a lot of time or money spent in developing new technology.

And also to provide as much data as was reasonable to get as many facilities as possible by January 1, 1982. And that direction was based on the fact that we were moving along independent of the development of the on-site technical support center.

We knew it existed, but we were not clear in our direction and they were not clear in theirs until --

COMMISSIONER GILINSKY: That was all the direction they get on --

MR. WEISS: No, they got some more.

COMMISSIONER GILINSKY: Okay.

MR. WEISS: We also provided them with some information with regard to the design pieces for that system. The first was that approximately 100 data points should be available for each of PWRs and BWRs. Those were defined and

that information is part of the Sandia Report.

The 100 data points were picked by the staff here after having picked the larger number and then we came down to that as a more reasonable number to handle.

We also indicated that the parameters ought to be sampled about once every minute in order to keep up with that changing situation, that there ought to be 30 minutes of pre-event data --

COMMISSIONER GILINSKY: Where does the one minute come from? It doesn't sound unreasonable, but --

MR. WEISS: It was the engineering judgment of the staff, and it was a compromise.

CHAIRMAN AHEARNE: Although there are some, depending upon the rate of rise or the rate of change in the parameters --

MR. WEISS: Right. That's in general.

There are some that we were concerned about from the standpoint of transients. We would have liked to have much more frequent sampling rate, that there we were considering possibly using some other method of seeing the transient occur, such as peak analysis, or peak value.

But we were also concerned with getting 30 minutes of pre-event data so that an event occurred there would be stored somewhere, probably in the operations center, that 30 minutes of data which we could then have to do an analysis of

the situation.

As I mentioned, some transient analysis capability for some of the parameters. The capability of storing up to two weeks of the event data when it occurred, as we were going through the incident. We could store it so that it could be available for trending and for analysis.

Also we wanted some --

COMMISSIONER GILINSKY: I guess what I was really asking was did you give them some sense of what was going to be done with this data? In other words, what are we going to use them for?

MR. WEISS: Yes.

COMMISSIONER GILINSKY: Other than just telling them, you know, we want to --

MR. WEISS: We had discussions with them based on our understanding of the role of the Agency and also they had subcontracted with MITRE Corporation who were, at the same time, developing the details of how that data would be acquired and used and displayed in the operations center for the people that would be there, based on our experience with TMI and our experience with other exercises.

CHAIRMAN AHEARNE: Now, as I recall, MITRE also ended up sitting in on some of the drills.

MR. WEISS: Yes.

So it was based on that experience.

HEARNE: But as far as the specifics of which
g asked to transfer, that was NRC staff.
NRC staff.
N: It really did come from people who were
ibility in the operations center or supporting
r others for information during the course of
sients or accidents we had experienced in the

said, the initial response was big, 300-some
ve went back and said, "Now, what do we
e started to think through what kinds of
pected to answer, what kinds of double check-
o on the status of the plant as advertised,
that plant.
judgment based on some experience and some
nagement and staff as to what one expects
rms of questions to be answered, in the course
ch one of these now.
But even so, that list that we gave to them
change those or we can add a few or take away
the overall cost doesn't change.
ve did ask -- another feature was the vent

ve storage here, some parameters, some
f, exceeding certain levels, this would

alert the operator or the duty officer that something was happening and then he could call up the data, or the data would automatically be brought up. And we were going to ask that the data be presented to the operations center in the standard format or protocol that would make our job a little easier here with the computer, in terms of software.

COMMISSIONER GILINSKY: Which of these impact most importantly on the design of the system, or the size of the system, or the cost of the system?

MR. BASSET: That must be the storage.

MR. WEISS: Okay. I guess the storage and the Data Link. That's one and three. The first three.

MR. STELLO: Sampling time.

MR. WEISS: Sampling time, too.

(Slide)

MR. WEISS: Okay.

To give you some understanding of -- we are talking about the 100 parameters, the systems that we were looking at and the amount of sensors per system, this could give you some idea of the kind of numbers. So that there are a reasonable amount of sensors for each system, but not enough for us to do a complete analysis and understand everything that the guy in the control room does.

Bob?

MR. BUDNITZ: Bernie, if you would put the previous slide back on. My memory is if you wanted to store several hundred parameters, say 500, it's 10 percent more, in one of the two largest options or if you wanted to store only a dozen parameters, it's only 10 percent less, provided the other things are about the same.

More or less, to admit and store. So there's no factors of two in that first one, but that 30 minutes of pre-event data and the software involved in that is an important part of it. That's a lot more than 10 percent, that third item. That's my memory. Does that sound about right?

COMMISSIONER HENDRIE: What about the sampling rate, Bob?

MR. BUDNITZ: I don't remember the sensitivity of that. Sam?

MR. BASSET: It's data times rate and the basis is from a single telephone and that will give you a certain amount of data times sample rate, and this fits within the on-flow and it accommodates some more data at this sampling rate or considerably more at a lower sampling rate, or so on.

COMMISSIONER HENDRIE: But if you drop the 50 data points every five minutes, or ten minutes, you still need the telephone line.

MR. BUDNITZ: You still need a transmission circuit,

and for reliability, you need a continuous one.

COMMISSIONER HENDRIE: So you haven't saved anything?

MR. BUDNITZ: There are 10 percent lying around, but --

COMMISSIONER HENDRIE: Well, presumably the terminal equipment comes down a little bit because you are just handling less material, but --

MR. BASSET: We tried to use one telephone as a bound but it turned out to be illogical.

CHAIRMAN AHEARNE: Your actual hardware costs are a small portion of the costs that you are investing in anyway.

(slide)

MR. WEISS: Basically what this is showing is the situation which will exist at the site with regards to the relationship of when there is an on-site technical support center and an emergency operations facility. There is a process computer now.

As we understand it, most of the licenses, in order to get the data into the technical support center emergency operation facility will have to have some kind of a dedicated mini-computer. They may be able to have some capability left over in the process computer, but most of them will probably have a dedicated mini-computer which will then derive the technical support center and emergency operations center.

So our problem is understanding that that is there, how and what is the best way for us to get the information from that and set up to the operations center. And in that, we have looked at several alternatives.

Basically, Sandia has -- alternative number one on this slide here is the Sandia concept, taking all of the inputs of just before, or at the process computer, putting it through some kind of a dedicated processor to a site transmission unit, which would then send the data to the operations center.

We have also looked, then, at another alternative which is a modification of that in which, instead of us being responsible for this site transmission unit, the cost of that site transmission unit, or the engineering costs, we are going to ask the licensee to put in the site transmission unit and pay for the engineering costs and merely hook up to the operations center.

So that would be driven by their dedicated mini-computer and essentially what comes out in the operations center is the same, it's just the effect at the site is slightly different and there is a difference in costs which we will show in a minute.

Those are the two main options. Then there are essentially two others that we have looked at to try and cost. One is, instead of us having a lot of capability here in the

operations center, we had their mini-computer to drive a line printer. That's all we would have here at the operations center is just a line printer, and then every minute or so we would print out here in the operations center the hundred parameters and their values and engineering use.

That's that option over here.

Or the other option is, if we had a computer here that could talk to their computer, and we would get the basic data also on a line printer, we would have some capability for some graphic displays which they could drive at our center here.

So we have a minimal amount of graphic displays.

There is one other alternative which we haven't really looked at very hard, but may have to be considered, and that is that if eventually the licensees are providing that information to some kind of an industry data link which we've heard about, we may be able to get the information from that industry data link rather than directly from the license.

MR. DENTON: This would be a link to the major vendors, possibly INPO and NSAC.

COMMISSIONER HENDRIE: How are they coming on that?

MR. DENTON: Let me ask Roger Mattson to describe our interactions with them. It is important to have a coordinated approach to this whole thing in order to beat the in-point dates we've established for January of '80.

CHAIRMAN AHEARNE: Also it's important because it wouldn't make sense not to.

MR. DENTON: This is an example where, if everyone does his own thing, it just complicates the --

COMMISSIONER HENDRIE: -- this is the greatest thing for mini-computers and terminal hardware and software people in many a day.

MR. DENTON: So I'm very much in favor of standardizing this connection as much as we can among all the plants.

Roger?

MR. MATTSON: Well, NSAC has got some kind of real time communication capability with plants, telephone, but no data link, as we are discussing here today. They have stayed closely attuned to the work we're doing on the data link. There have been communications in a licensing format, a letter from the Director of Operating Reactors to the plants telling them they've been working on this stuff and they ought to pay attention and stay tuned. That kind of thing.

Sam Basset, I think, has had some conversation with the four venders who are talking about vender data links. Do you want to fill in the blanks here?

MR. BASSET: Each of the user groups has made a proposal to their users and a committee comprised of users and in each case it incorporates TSC provisos and the user

wants it available, the user group, the vender who is the sponsor of the user group, wants it available so he can have information back at his center of expertise. The reactor people want it to send to their board of directors or to a central command headquarters, if you will, in the loop, for example, Commonwealth Edison, they are going ahead with direct communications from all of the reactors through to a central station.

I think it is significant that each of these skills* is by definition different. The four venders have each come up, approached the same problem with a slightly different data list and with the natural differences in engineering outlook, so each scheme is different, and they are not now compatible.

However, they all face up to the same basis problem and provide comparable suitabilities.

MR. MATTSON: It's fair to say that there is a certain amount of confusion on this issue. We have required these people to put in tech support centers, and yet we have not specified yet the information that goes into those support centers.

We are also about to specify certain design criteria or safety monitor consoles. We have talked about this in the context of the lessons learned in the action plan now for some months.

Those criteria are going to be issued this summer,

or late this summer. They are waiting for us, some of those utilities, in the sense of only wanting to meet our minimum requirements. There are other utilities who aren't waiting for us. They are very anxious to get tech support centers in, to get control rooms backfit and to move forward aggressively in this area.

Their concern is that they are spending millions of dollars per unit and that they'll be buying things that won't be compatible with our system.

So the point that Harold makes about standardization is a very important one. You can see yourself, if you don't get these things compatible and hooked together, having an accident, or some kind of situation where one guy's got one kind of data and another guy's got another kind of data and the two don't come from the same place, they're not thought of in the same way -- PSIA versus PSIG or whatever, leading to confusion and difficulty.

So it's not only front-end money and confusion, but possibly poor handling of an accident if they're not done right.

MR. DENTON: Industry recognizes this. They do have a task force put together that is working with the staff. As usual, not all members of the industry are in favor of a unified approach and some venders want to break out and do it separately.

I think what we really need is an agreement in principle on how to proceed down this line and then we can work out some of these interfaces Roger is talking about.

CHAIRMAN AHEARNE: INPO at one stage several months ago talked about trying to have that kind of a systems data link. Whatever happened to that?

MR. MATTSON: Well, the industry has tried to get its act together, to try to sort out who is setting industry's policy, if you will, in this area.

A committee has been formed with Ed Zabrasky from NSAC; Steve Howell, the Vice President of Consumers Power of Michigan; Roger Newton; let's see, Ward Owen is also involved because of the link to the emergency operations facility and the information needs for emergency management.

They've had several meetings and on their committee they have representatives of venders as well as utilities. We are scheduled to meet with them on the 20th of May and they are going to come in and say these are the priorities we see, like put first priority on the safety monitor console and then stop into the control room, aiding the operator, and then make the other things compatible with that, rather than vice versa.

These are the schedules we think things are accomplishable on, and preliminary information we see as compatible with the action plan, at least in so far as the control room is concerned. And we are making a similar effort

in the staff to coordinate our diverse interests, the I&E and research interests. The Nuclear Data Link and the NRR interests in the control room and we will be prepared to meet with them on the 20th and be prepared to solve some of these compatibility questions that are open yet today.

(slide)

MR. WEISS: Okay, keeping in mind those alternatives, this chart is an indication of some of the features of each one of those systems, because they don't exactly all have the same features, and the costs to operate this.

Alternative one, you notice, they all require some kind of processing, some kind of dedicated mini-computer, to get the information. Alternative one, however, is the only one that does not require a technical support center computer. It was designed, as I indicated before, so that --

CHAIRMAN AHEARNE: By that, you don't mean that we wouldn't still end up requiring a technical support center computer for the technical support center? It doesn't use the technical support center.

MR. WEISS: Right.

It means that if we didn't want to wait, or we felt it was necessary to do this rather quickly, we could go ahead with alternative one.

All the others, we have to wait for the technical

support center for all this extra detail.

All of the alternatives, except number four, require some type of an operations center computer. Alternatives one and two, we will be able to take the data that is stored at the center and manipulate it for different and various kinds of graphic displays.

Alternative three, there will be a minimum capability for graphic displays and in alternative four there will be no graphic displays, just a tremendous amount of data coming out.

The site transmission area that I indicated before, in alternative one, the NRC would pay for those and in the other alternatives, the licensee would have that responsibility and we would have to set the specifications for that.

As you can see, the costs to install -- and this would be the total cost to the NRC, not to the industry. The industry costs are highly dependent on the technical support center's being compatible with that, and whether the existing data, the existing sensors are there, and what the costs are to bring that information out.

The cost for alternative one is about $17 million and the cost to operate it on an annual basis would be about $1.5 million.

CHAIRMAN AHEARNE: Could I ask you some questions

about those?

MR. WEISS: Surely.

CHAIRMAN AHEARNE: Are these modifications of the Sandia estimate? Let's take alternative one -- or do you just back out the contingency costs?

MR. WEISS: No. We backed out some of the contingency costs, but basically alternative one, the difference between that and the report is that we took out all of the operation and maintenance costs, and the contingency associated with that, and that brought that down to $17 million.

MR. HOWARD: As well as anything that would reach forward into phase two.

MR. WEISS: And essentually, alternative two is the Sandia costs, but what we took out there was also the operating and maintenance costs, plus all the costs associated with site work, such as the STUs themselves and all the engineering work that would have gone on to make that interface.

CHAIRMAN AHEARNE: But then it would be correct to conclude that in alternative one, the actual hardware cost is about $2.9 million?

MR. WEISS: That's right.

CHAIRMAN AHEARNE: So that --

COMMISSIONER GILINSKY: Were is the rest of the

costs?

CHAIRMAN AHEARNE: Most of it is design, project management.

MR. WEISS: Software. A lot of software.

CHAIRMAN AHEARNE: Now, as you go down from one to two to three, most of the cost reductions occurring in hardware, software, management, project management --

MR. BASSET: Maybe I should address that.

Most of the reductions occur as we go down in terms of engineering man years. That is the basic man years. The hardware difference between two and three in terms of headquarters display, and what have you.

But if you could analyze this task, the basic problem is there are 70 reactors, each of which has a different information system and it is necessary to have all those different organizations brought together to transmit a uniform signal into the headquarters.

The alternative would be 80 sets of software at headquarters, a tremendous expansion of machinery in headquarters. So your site has to be independently investigated and the situation determined and appropriate software written to render this signal forward.

So that is, then, the difference between number one and number two, and it is largely in there.

COMMISSIONER HENDRIE: What you do in the difference

between one and two, Sam, is just transfer that conversion at each plant from us to the licensee.

MR. BASSET: We respect that as a very heavy task and industry has estimated this separately for us and they think it is a heavy task per site, and that accounts for a substantial amount of engineering man years.

COMMISSIONER HENDRIE: How do they count -- your difference is about $6 million here for '70 --

MR. BASSET: Their estimate was on the order of $200,000 per site.

MR. HOWARD: You're talking about the $2 million --

MR. BASSET: It's $200,000 per site, assuming you don't have to install any new sensors or put in any new wires. If they have to install sensors per 197 or our data list exactly, it goes up to $4 million per site, because putting in an individual sensor, and pulling the wires, and making all the drawings and so on is a very expensive undertaking.

If they are to implement the sensors they have got and to preserve the system we are talking about, they estimate about $200,000 per site.

Now, I should point out that they will also have to meet a necessarily elaborate interface specification, and this would require expenditure of manpower to do that, and I am pretty sure they didn't allow for.

CHAIRMAN AHEARNE: Sam, the reduction then when you go from two to three, you pick up primarily where?

MR. BASSET: Well, that picks up on the fact that between two and three, we built three up from four and we built two down from one.

CHAIRMAN AHEARNE: Okay. Go to four then.

MR. BASSET: So we took four --

CHAIRMAN AHEARNE: Four, you essentially have --

MR. BASSET: A lease line --

CHAIRMAN AHEARNE: -- A printer.

MR. BASSET: And a printer. And we would take data in an appropriate and transmitted format and just print it up. And that requires an open computer at the headquarters operations center, and by definition, a very small software package. As soon as we go up to any --

CHAIRMAN AHEARNE: But you essentially are also saying you have very little engineering man-years required to do any of the formatting at the site.

MR. BASSET: Well, we'd have to put an interface spec, and the site would have to do a substantial amount to get that data into that package for transmittal over the wire. And we don't assume any of the burden for that other than the specification.

CHAIRMAN AHEARNE: Okay. So that's embedded in licensee cost.

MR. BASSET: That's right.

MR. HOWARD: You're talking about $350K for software.

CHAIRMAN AHEARNE: Okay. Per site. Then when you built up to go from four to three, what did you add back in?

MR. BASSET: What we did was provide headquarters graphics capability of an austere sort; but this requires a computer at headquarters; and that computer, the software, and the human engineering of the displays and determining what the functional requirements were for the display area accounts for the escalation from a half million to $8 million.

CHAIRMAN AHEARNE: So you're saying that it would take roughly $7 1/2 million to engineer and build by the equipment at the headquarters. That would be viewed as strictly a headquarters cost.

MR. BASSET: Plus software interaction with the site computer which we're depending on to help get out the information.

CHAIRMAN AHEARNE: Bob.

MR. BUDNITZ: If you tried to do an overall efficiency and summed our cost plus the licensee's cost, one is more efficient than two. That is, if you go from one to two, my impression is you save government funds to the tune of $5 or $6 million, but the licensee's costs are greater than that because of the way the task would be parceled out for them.

And I myself haven't understood why they couldn't get together and do it in a way that would be as efficient as us, but

that's the way the sums seem to look.

CHAIRMAN AHEARNE: Of course, it's not out of reason, is it, for us to do it, but to then just as we levy a licensing fee --

MR. BUDNITZ: Well, that's another decision. I'm just making the point that the inefficiencies are greater in number two than number one by some factor, like a factor of two or more.

MR. DENTON: Well, the way I see it, we're talking about as though our response center was another on-site support center some place, for example. I envision that every plant will have as a minimum what we require, and they will have certain data in the control room, they will have certain data in the on-site center, probably somewhat less data or a little differently portrayed in the off-site center, and then we'll have the data.

And the fact we're setting the minimum standard, everyone will have this access, and I would like to see a case whereby we could just have a plug into their system somehow, if we can get them to agree on the scope of the minimum package and the interface requirements.

CHAIRMAN AHEARNE: Sam, in Harold's description of the approach, if that were to be the case, would it still end up costing us in the area of $10 to $12 million?

MR. BASSET: What Harold is describing is our understanding of alternative two. And the reason is that in addition to the plug, we have to get heavily into what they're doing with

that information on the site, not in a director's sense but in an understanding sense. We have to lay a very comprehensive interface specification on them; otherwise, point one from site A will be different than point one from site B, and it will be years untangling the software difficulties. And as each site evolves its handling of data which --

CHAIRMAN AHEARNE: Yes. I think I was assuming that embedded in Harold's is that all the sites are doing it the same way.

MR. BASSET: They will probably have the same -- it's my estimation that they'll probably have the same end result, but each one will achieve it with a different computer and a different software package.

MR. MATTSON: Yes. They will not all be doing the same thing in their tech support center. It's a point of compatibility, more than minimum standards, I think. There may be other standards that we will issue which apply to tech support centers or EOFs. We might say each EOF has to have a certain minimum package of radiation monitoring off-site which is in addition to a nuclear data link package, and wouldn't come out for some months or even years yet after some experience with these things.

MR. DENTON: There has been some sympathy on the industry side that they should all get together and write identical specs and all order the same equipment on bids and have

it all compatible; but that seldom works out in real life, and we will no doubt have these problems.

COMMISSIONER BRADFORD: When are they required to have the technical support center?

What is the date for the requirement on the technical support center?

MR. MATTSON: The date that the criteria issue or the data that criteria have to be met? They all have --

COMMISSIONER BRADFORD: Have to be met.

MR. MATTSON: Well, it's a multi-stage process. They were all required to have some kind of tech support center by January 1, '80. In January 1, '81 they're required to meet habitability and some other criteria that were specified in short-term lessons learned.

We've said all along they have to have information capable to do the things that you're supposed to do in a tech support center by January 1, '81. But we've never issued any detailed specification of what that information is.

The likely outcome of this is to say here is some minimum set you have to have by January 1, '81, but by some further date in the future, maybe January 1, '82, to be compatible with the control room, and to be compatible with the startup date being assumed in the Sandia contract. We would say by January 1, '82 you shall as a minimum be compatible with the data requirements for the nuclear data link. That is, you'll have at least

that much in your technical support center.

COMMISSIONER BRADFORD: But there are probably some real inefficiencies in not getting that out pretty soon, aren't there?

MR. MATTSON: We can write it tomorrow.

COMMISSIONER BRADFORD: They must be going ahead.

MR. MATTSON: If we could have written it six months ago, we should have written it six months ago. If we can write it tomorrow, we would; and we're working to the extent resources allow to get this thing cleared up and to get the criteria out.

MR. WEISS: Okay. The only other slide which we have here are some of the other concerns -- and some of them I think we've already talked to -- that the staff is having before it can come back and ask for some kind of approval on the data link.

The first one has to do with should we set performance objectives or specified data analysis in the trending techniques? That's one of the things that will be discussed with industry.

We talked about the procedures for developing detailed specs to provide NRC with the uniform formatted data. When we do that we're going to have to determine some kind of a timetable for implementing the data link.

We'll also obviously have to come up with some plan to fund the project needs. We're also going to have to take into consideration some of the questions that are now around about

the physical location of the operations center and the space requirements; and we're certainly going to have to factor in the ACRS concerns which we've just gotten.

COMMISSIONER GILINSKY: How do you react to their suggestion that this be approached a piece at a time or at least tried out with one or two plants, I think they said?

MR. WEISS: I think the original proposal from us was that as we went forward, we would certainly have a lead plant that we would go to and implement and see how it worked out. We were not going to do directly to 70 different plants. We were going to go to one or two, so that is not of great concern.

CHAIRMAN AHEARNE: Well, some of it you can do on that basis; some of it you can't. You can't, for example, if you're trying to get the standardization approach, you have to try to reach some resolution on that, are we going to require standardization. And you can't really take a couple of plants and look at those and take a couple of years looking and then decide that --

MR. WEISS: No. I meant strictly during the implementation stage.

CHAIRMAN AHEARNE: Yes.

MR. MATTSON: And there are utilities who want these tech support centers looking like Cadillacs as quick as they can get them. They're convinced this is a way to control access.

COMMISSIONER GILINSKY: Doesn't this standardization have benefits quite apart from whether or not we plug into these

systems? So it would seem to me that that is something one could go forward with independent of just how elaborate our own system would be.

CHAIRMAN AHEARNE: True, but it certainly gives us a stronger push if we have in mind at some stage making sure that we utilize some of that data.

COMMISSIONER GILINSKY: Well, we're certainly, you know, thinking very seriously about that.

MR. DENTON: And it's not just the data. It's the diagnostic and analytical capability in each center, and it seems to me the more that the industry standardizes, the more efficient their operation will be in providing codes for analysis and interpretation of the data that is there. So I think you're right. There are a lot of motivations for standardizing the set of information as much as possible so it can be handled --

COMMISSIONER GILINSKY: Yes. I would think we would want to go forward with that in any case.

MR. DENTON: And we are on a time scale to do it, as Roger said, but it's not been done yet.

MR. DIRCKS: That would be going forward with --

MR. DENTON: With the definition of what's required in the safety vector or safety console in the control room.

MR. DIRCKS: And the number of parameters.

MR. DENTON: And what is the set of parameters. I think I've heard Zebrowski say that our set of

parameters, for example, is about 85 percent of what he recommends he'd add a few more in in order to meet what he thinks is a safety vector.

So we need to close on that definition of the safety vector and then let that drive the data links on down.

CHAIRMAN AHEARNE: Of course, at least the way you're using the term "safety vector," that's a larger set of data than we would need.

COMMISSIONER GILINSKY: Well, let's see. He said 100 was about 85 percent of what Zebrowski is talking about.

MR. MATTSON: No, no. Don't get the two confused. The safety monitor console is that set of three dozen or so P parameters centrally displayed, specially annotated so that a shift supervisor or shift technical adviser can see whether the actions being taken by operators are worsening or helping a transient situation. That's a subset of the 100 parameters or so in the nuclear data link and displayed in the on-site technical support center.

CHAIRMAN AHEARNE: Right. But I thought Zebrowski's description was a larger set.

MR. MATTSON: No. Zebrowski's statement about the 85 percent conformance is 85 percent of what NSAC today thinks should be on the safety monitor console is included in our 100 parameter list, and the other 15 percent is probably about the same scale of the plant unique parameters that won't be on

anybody's general list. They'll only be derived when you look at specific plants.

CHAIRMAN AHEARNE: I guess what I was trying to get at, I thought Zebrowski's concern was what was required to control the plant, which is, at least in theory, a little different than what -- going back to the first opening discussion.

COMMISSIONER GILINSKY: Well, it seems to me that these decisions are to some extent separable. They're obviously related also, but nevertheless separable, and there are a lot of reasons for going ahead with the standardization of the displays as soon as we can.

MR. DIRCKS: You talk about moving ahead, having all these things set up in the centers.

COMMISSIONER GILINSKY: Right, in a standardized way.

MR. DIRCKS: And the second question is how do we link them up back here.

COMMISSIONER GILINSKY: It is something we may want to take a little more time to consider.

MR. STELLO: You mean like you might want to hook up two and wait and year and then decide whether you want to hook up the rest, or five more or ten more?

COMMISSIONER GILINSKY: Well, you might want to decide just how elaborate a system you want here. I don't know whether you need to commit yourself at this point to do that.

MR. STELLO: Well, to do any or to do one or two?

CHAIRMAN AHEARNE: You've got to make a decision, or we have to make a decision on what we want to be transmitted back even on a pilot plant basis.

COMMISSIONER GILINSKY: Right.

MR. STELLO: And the next decision you're going to make is if you build in a system here, do you want to build it in with the capability to be able to go all of the way, or would you want the system to have only the limited capability of a pilot plant, to handle only one?

I'm trying to understand your question. Do you want it to look at a concept of --

COMMISSIONER GILINSKY: Well, I'm not prepared to decide that now.

COMMISSIONER HENDRIE: I think what Vic is saying is that it seems to him the first thing you set out to decide -- and not to imply that these are all separate and independent things that are not related -- but the first thing you decide is what minimum specification ought we to put on the information to be available at plants, a) on the safety monitor console, and b) in the technical support center. Okay. Having done that, you now decide, and how much of that, if any, is to be direct line transmitted to the NRC.

And Vic's saying is that the decision on what's transmitted to the NRC needn't necessarily be made simultaneously with the first decisions, although I'm sure we all recognize that when

you decide one thing, you have certain other things in mind down the line, so there is some effect. And I think you probably were right; that is, if we go ahead and thrash out the safety monitor minimum parameter lists and the minimum information list for technical support centers and get that on the street, why, you probably provided considerable guidance right there.

The minimum, just meet bare minimum, the utility crowd now has some guidance as to how far up they're going to go, and the people that want to do a lot better than that know that they have to at least get those things into their package, and then where they go from there is probably not --

You were leaning forward, Roger.

MR. MATTSON: Yes. There's a problem with the method you're suggesting. I'll admit it's logical and --

COMMISSIONER HENDRIE: I'm not suggesting it. I'm attempting to elaborate what I --

MR. MATTSON: That's not the approach we're on.

COMMISSIONER HENDRIE: Yes.

MR. MATTSON: And the reason is basically a resource reason; that is, the capability of this staff to generate enough people with the right expertise to write the information criteria for tech support centers in the 70 operating plants and the ones coming on line. They are enough different that that is a big job.

The philosophical approach we've been following is

to say that is the center from which the chief executive officer or his appointed decision-maker will make the decisions, by god, one way or another involving that billion dollar facility.

Now, gentlemen, you put in that technical support center what you need to make that decision. Now, we've got some responsibilities in addition to that -- the first slide. As a minimum, we need information to conduct or meet those responsibilities. Those should be compatible with what's in the tech support centers. And oh, by the way, we are going to put some requirements in the control room, because that's the highest priority and the first place we all want to concentrate.

That is more the philosophy rather than the sequential approach that you've described.

COMMISSIONER HENDRIE: Yes, yes. I think you come to the same place.

MR. MATTSON: But we're using their resources in our --

COMMISSIONER HENDRIE: Yes, but let me say -- let me represent myself as Jonathan McSkinflint, the chairman of the board of the cheapest nuclear facility on the face of the earth, okay? I've never done any more than meet the absolute, irreducible minimum of the regulations, and by god, it's my intention our company never will. Okay. We're doing better than that.

MR. MATTSON: We'll get him.

COMMISSIONER HENDRIE: No, no.

(General laughter.)

MR. MATTSON: As soon as we --

CHAIRMAN AHEARNE: Roger, Roger.

COMMISSIONER HENDRIE: Hear me out, okay? Now, what I will say to you is I don't need any of your claptrap in a technical support center to run my plan. It's safe enough for me. And I'll have to meet your minimum regulations in a minimum fashion to make it safe enough for you to allow me to continue to have a license.

Now I say to myself good, now, what is my design basis for my technical support center? I don't think I need one, and I don't think I need any information in it, okay. I'm just going to call up the guy in the control room and say Smithers, keep it running; never mind all that stuff about emergency core cooling. okay.

Now, what's my design basis then for my tech support center and my safety monitor in the control room? It's going to be your list for the data link, because I regard the whole thing as superfluous anyway; and so once I've met your minimum requirements, I'm going to come back and tell you all right, you want me to have a tech support center; I've got one, okay.

You know, it used to be the cloakroom, and I can now put an air conditioner it it because you're talking about habitability, and you want to know what information I need in it to run my billion dollar facility, and guess what -- it turns out to be your data link list. And the same in my control room on my safety console, okay.

Now you come back to me with, I don't know, Commonwealth Edison's Pink Cadillac Technical Support Center and ask me why I haven't done that well with 117 different parameters and $10 million worth of computer displays and so on, and I'll tell you that that crowd is just having a good time with computers, and if they were interested as I am in making minimum cost electricity, they wouldn't have a damn thing more than I've got. And what are you going to do?

I don't think you could get me. I think I've met your requirements.

MR. MATTSON: Well, I think you've --

COMMISSIONER HENDRIE: So in a real sense, in a real sense I continue to say that this list, whether we label it as our list for data transmission or you label it as here's what we think the minimum tech support center parameter list is turns out to be a significant --

CHAIRMAN AHEARNE: But, you see, now you've come full circle back to that we have to really make this decision on what kind of information we need. It's this data list.

COMMISSIONER HENDRIE: But you could also make it in the sense of here's what we think they ought to have in the tech support center, and later on decide whether we're going to take all of that in here or not.

But I recognize what you're saying, Roger, in terms of the approach to this.

Let me say one more thing, and that is that whether you look at it the way Commissioner Gilinsky was looking at it or the way you would go about it, it seems to me this fundamental decision that's going to come up has got to be made pretty soon. It seems to me the fundamental decision is are we going to have a data link system or aren't we going to have a data link system, and are we just going to get along with the telephone lines, okay.

If we're going to have a data link system, then I don't see a great deal of merit in waiting and sort of drawing the whole thing out. All that means is that it will be two additional years or one additional year or whatever before you get in place whatever system it is you're going to get in place. If the system is useful -- and I presume it is or we wouldn't -- that there is merit to the argument that it is, or we wouldn't all be here talking about it -- if the system is useful, then we need it yesterday. That is, if the system is useful, then there is a high premium on getting it operational.

So I think we're propelled forward here by logic and events and just need to get on and make some of these decisions and go for it.

MR. DENTON: Our current efforts would call for decisions on the control room information and the on-site support center information in a couple of months. In other words, we think we can work out the difference between their list and ours

in about that timeframe.

I certainly support the idea of a data link that ties into it. It's just that I can't quite foresee yet which one of the various options is the most societally effective way of tying into it. But I'd see this system where we would require some sort of compatibility among all plants, and we would have a data link, and utilities would have at least that much information available to them in their own off-site centers.

And I think we can proceed to work out these details if the Commission concurs to move that way, recognize that the costs will probably be up at the high end of the table that was shown.

MR. DIRCKS: And I think it's linked to who moves out first. Alternative one almost is our moving out first with our system and the industry catching up. I think what we're talking about is getting them out front, and we link into it.

COMMISSIONER HENDRIE: Listen, that chart with all the -- the blot diagram chart, is that left out of my printout package deliberately or to keep me confused? Why don't you go back on the screen with it?

COMMISSIONER BRADFORD: On which of the executive models did you build Brookhaven's reactor?

COMMISSIONER HENDRIE: Heh?

COMMISSIONER BRADFORD: On which of the executive models did you build the Brookhaven reactor?

COMMISSIONER HENDRIE: Which of these you mean?

COMMISSIONER BRADFORD: No, no, the skinflint or the pink cadillac?

COMMISSIONER HENDRIE: By god, McSkinflint. The character I just erected doesn't come unnaturally.

COMMISSIONER BRADFORD: It seemed to have that flow.

COMMISSIONER HENDRIE: I inherited a project or took over a project which on its first day had a $10 million authorization from the Congress and about a $13 million cost estimate came in the next day from the preliminary design Trident. Well, but that's another story. Now, back to this one.

Actually, you know, on that reactor, why, our technical support center consisted of the operator would look at the control board, go out onto the balcony on the operations floor and holler hey, Bob. The chief had an office down over there, so it worked fine, as a matter of fact.

I'm curious why alternative one took us all the way back in at the sensor inputs to the licensee's process computer.

MR. BASSET: I'd like to address that, Commissioner Hendrie.

At the time we kicked this program off we had no definition of TSC whatsoever, and we designed a data link that would accomplish the mission without any reliance on a dedicated mini-computer for other purposes at the plant.

COMMISSIONER HENDRIE: Or even the process computer

that almost all --

MR. BASSET: Well, in looking into the sources of data it became readily apparent that we could not rely on the process computer outputs, especially during the time of accident or incident, because it had a history that indicated it could barely keep up with its regular tasks. Demanding of it to process and format and ship data at the same time was not feasible. So it became readily apparent that you'd have to acquire your data --

COMMISSIONER HENDRIE: On the front end.

MR. BASSET: Out of the input, maybe out of the input memory of the process computer, or maybe all the way back to the sensor. We weren't certain. But in any event, we had to provide acquisition of data and a dedicated computer to process it, and this is a stand-alone system that could be implemented, and we could roll forward with it and get it in at this point now by the end of '82, the fall of '82, without any further action; but it would be a unilateral sort of implementation.

CHAIRMAN AHEARNE: Well, Sam, then does alternative two assume that there'll be improvements in the process computers?

MR. BASSET: No, sir. It assumes that they will make a similar access to the data for their own purposes using the licensee dedicated --

CHAIRMAN AHEARNE: So the dedicated mini-computer goes back around --

MR. WEISS: It's really up here.

COMMISSIONER HENDRIE: That's it. The line's not really correctly drawn.

MR. BASSET: And this achieves enormous advantages in terms of lack of duplication of site work, and that accounts for the difference.

MR. WEISS: Including software.

COMMISSIONER HENDRIE: Say that again? If we've got a dedicated processor in there, why, presumably in principle we could take a parallel outlet from that and pipe it to their technical support center and charge them $10,000 a year for applying their information.

MR. BASSET: Yes. That would be another way to do that. That would be another way to implement it, but in terms of the site --

CHAIRMAN AHEARNE: And we could add to our enforcement package pulling the plug.

COMMISSIONER HENDRIE: That's right. An intermediate. Some place between plant shutdown and --

MR. DIRCKS: We could go to the Treasury and borrow the money and have some -- we could pay it back in a revolving fund.

COMMISSIONER HENDRIE: Did you get that under Moynihan's staffer?

MR. STELLO: There's a real difference, though, I think between one and two, Joe. The concept of one is looking at our needs, sizing that process for our needs. Two will have our needs

plus the things that if, you know, he wants the pink Cadillac, it has that, too. It will have hopefully a lot more. So there's a strong incentive --

CHAIRMAN AHEARNE: But our needs would be a subset, and in the McSkinflint option there would be only one subset --

MR. BASSET: It would be the same.

CHAIRMAN AHEARNE: Yes, it would be one set. Nevertheless --

MR. STELLO: But I'm pointing out that there's a real incentive to want to try to go with alternative two, since it now allows him to build in a system that will do all the things he wants, and ours being a subset of it. So there's a desire to want to go this standardized way. The concern I've got in trying to do it is how much time have we added, and I don't think we really know the answer.

MR. BUDNITZ: I just want to make one comment, and that is that the date in '82 that has been assumed here, the key part of all this, if you're willing to wait another year or two, why, a whole lot is different; and yet, I understand why one wouldn't want to be linked to this delay at all.

COMMISSIONER HENDRIE: What is different, Bob? What do you do differently if you've got another year or another two years?

MR. BUDNITZ: Well, I'm talking about for the stand-alone system, for the option one.

COMMISSIONER HENDRIE: I don't understand it. Please explain.

MR. BASSET: The reason for option one's bounding condition is that we need a set date for the quality of data.

MR. BUDNITZ: Yes. Independent of the TSC and everything else.

MR. BASSET: This meant getting into 70 different sites, doing 70 different site application engineering jobs, if you will, and getting is all into a common format and getting it on the line. And that is an enormous amount of work, and that accounts for the high number one option estimate.

If we can phase it, which appears to be logical, with the TSC such that the site-specific engineering is done by the vendor or by the operations center, then that savings is there, and what goes with it is the delay necessary for each one of them to do it and to come up with the signal. So it will take longer.

COMMISSIONER HENDRIE: Okay. That is, you say if you hadn't a January '82 date in there, you wouldn't have had alternative one. You would have started with what is now alternative two.

MR. BUDNITZ: Or it would have been reduced a good deal.

MR. MATTSON: I think we've been glibly saying one and two probably had the same end date or assuming that, or some assume they have the same end date. When you turn over, what

we were going to do with one contractor, albeit a very qualified contractor to do for everybody, and say now we're going to let 70 different contractors do it or people that control contracts that aren't us, then some of the dates aren't going to be met.

MR. DENTON: But even one, even one, though, has the disadvantage, even though idealistically it might go a little bit faster, it would require an awful lot of signal conditioning at the station to be sure we were fed right. It seems to me that as time goes by, you'd have to keep that information going in our system updated and modified and so forth. And with system two whereby the utility undertakes to keep the thing constant and current and we just feed off that.

MR. STELLO: No, Herb. Our system assumes we're going back into the sensors and as a complete package, so we're completely independent on that.

MR. DENTON: But just the number of amendments we process each year tells me that even the sensors show that things change enough that there'd have to be continuing some modification to a front-end package over the years.

MR. STELLO: Well, that's if you change your mind on what you want in the nuclear data link, and that comment applies with all systems forever.

MR. DENTON: My comment was I didn't see an ability to walk away from a single electrical hookup very long.

COMMISSIONER GILINSKY: Bernie, can I get back to the

ACRS letter? Bernie said that what you were thinking about doing was compatible with what the ACRS was suggesting; but as I read the letter, they're really saying that -- they say, "We recommend some type of data link be installed, but we suggest that an early installation considerably less elaborate than the one described to us should be installed initially in order to gain experience needed to specify a final system."

Now, that doesn't sound like what you were suggesting. You were saying rather that, sure, we're going to go in first with one or two sytems simply because there's got to be a first one, and that will aid us in shaking down the system. But they're talking about trying it out before specifying a final system, and I assume not the system at the reactor or at the support center but the system that ties us into --

MR. WEISS: You keep talking about different systems. The alternative one which is part of the Sandia report, when you are talking about a stand-alone system, that was the concept to go to a few lead plants and get a feel for what the situation was. But that was independent of the technical support center, and therefore, we were not depending on it. If you talk about alternative two, then that's a different concept. We really haven't looked into that in detail, and that hasn't been considered. So I was really just referring to alternative one stand-alone.

COMMISSIONER GILINSKY: Okay. But if we're talking

about plugging into the utility system, then it seems to me what the ACRS is talking about is rather different than what I hear people talking about here.

MR. WEISS: The intent was for the set of parameters the parties specified to go to one facility, one utility and have them feed into the system, so it was just prototyping rather than changing parameters.

COMMISSIONER GILINSKY: Can you tell me why they're wrong?

MR. MATTSON: They only looked at alternative one. With alternative one what they say, we agree, makes sense. They never saw alternative two. That's something that's come up as we've tied together these things in the last few weeks. We haven't looked at whether it makes sense to do pilot plants with alternative two.

What it means on the surface at least is it slows down implementation of a tech support center using the --

COMMISSIONER GILINSKY: I don't see why it slows down tech support centers. It's going to slow down implementation here.

CHAIRMAN AHEARNE: The ACRS letter, unless you've got more discussion from them, is not crystal clear, at least to me, about their --

COMMISSIONER GILINSKY: Are you going to pursue this any further with them?

MR. STELLO: Yes. Let me -- it's hard to ever decide what the ACRS says in letters, but when I read the letter I guess I walked away with the --

COMMISSIONER HENDRIE: Gee, mine used to be crystal clear?

MR. STELLO: Really?

(General laughter.)

COMMISSIONER GILINSKY: I remember Hanauer once couldn't interpret a letter that he had written some years before.

MR. STELLO: The way I read it is don't go out and hook it up to every plant right away. Try one of two first and kind of see how it goes, and see if you're going to change the role of the agency, and maybe what you'll be looking for several years from now is different than what you want now.

That's the thought that I had, and that's why I started out this meeting talking about the role. If we think three or four years from now we're going to be talking about something different than we are today, we might be talking about a different system. But I still viewed it as just one or two plants rather than all of them, and we would go that way. We would start out with getting it hooked up and seeing how we work with one or two plants. We're not going to hook up all of them all at the same time.

CHAIRMAN AHEARNE: Bob?

MR. BUDNITZ: Wait a minute. I think I understand

what they said, and I want to say that if I do, I do not agree with it personally. What they're saying is that early installation of a considerably less elaborate system than the one described to them should be installed in order to gain some experience before you specify the final system.

It sounds to me, you go out and you do some early work before you specify the final system. Now, if that's what they are saying, and it sounds like it, I don't agree with it.

CHAIRMAN AHEARNE: Well, there's only way to really find out, and that's to talk to them and --

MR. BUDNITZ: I know. But specifically, I don't think any of us who have worked on this -- and I haven't been as involved as, for example, as some have, would agree with that, and I think we're going to have to get back to them and clear that up. I don't think it's ambiguous.

COMMISSIONER HENDRIE: Yes. I don't see why it's necessary to spend a year hanging up some rinky-dink four pressures and a temperature link. What are you going to learn from that?

MR. BUDNITZ: That's just the way I feel.

COMMISSIONER HENDRIE: Well, you'd be older and wiser in a year, but that's going to be because you're a year older, not because you sat there and looked at three pressures and a temperature off a little cheapie. It seems to me that if we're going to do this thing, why, we know enough and are

beginning to understand enough of the difficulties and advantages and various options to scramble around and make a decision.

CHAIRMAN AHEARNE: Peter?

COMMISSIONER BRADFORD: You're not going to ask me to pick an option or anything.

CHAIRMAN AHEARNE: No, no. I was just going to ask -- Victor, and Joe and I have made a number of comments here. I just wondered whether you had any comments.

What I want to get to is I want to ask Bill where he intends to go from here. This is a status report they were giving us, and we've been giving them some advice.

COMMISSIONER BRADFORD: Let me ask a question about timing, and if you covered it at any point, I'll just read the transcript.

You've got the general requirement that licensees have to call us within an hour of things going wrong, and you've got a proposed capability to recall the thirty minutes before an accident by way of data.

Now, supposing the licensee waits 45 minutes before informing us. Is that going to cancel out the capability of recalling any information before the incident has started?

COMMISSIONER HENDRIE: No, because you're on line all the time.

MR. HOWARD: You have the alert proviso.

MR. BASSET: The alert proviso would give us an alert

and cause him to call him if he should fail to call us.

MR. MATTSON: The telephone is not the trigger in it.

COMMISSIONER HENDRIE: Furthermore, once you get as far as they've talked about here, you've got the system on line all the time and it's got the previous 30 minutes stored in it. And some or a couple of parameters get spooky and trigger the alert thing, and the thing goes beep, and our guy goes over and calls up, what's going on at X plant and says gee, that's interesting.

COMMISSIONER BRADFORD: Okay. And it's those parameters going off that freeze the 30 minutes?

COMMISSIONER HENDRIE: Well, the 30 minutes is just there all the time.

MR. BASSET: It starts the ongoing event recorder also.

COMMISSIONER HENDRIE: And it's no great shakes if you want to make sure that you don't lose any of that 30-minute history that's stored to have a thing where you press a button and just shoot that on to tape, and then it is there permanently whenever you want to snap it back.

MR. DENTON: A reactor trip could be a signal to stop the erasing.

COMMISSIONER HENDRIE: And so there are all kinds of ways to -- once you get into this kind of system there are all kinds of ways to make sure that you don't lose the history.

COMMISSIONER BRADFORD: Okay. My only concern is to

make sure that some such way was built in and then that you didn't get into a situation where the call or alert coming in 45 minutes after was the first alert.

COMMISSIONER HENDRIE: Well, once you get to the investigation level of alternatives one and two, why, I think you do, but well, you've got enough stuff there so that you can go that extra step without a great deal of trouble at that point. You get in four and all you're getting is just line printer off his stuff back at the plant, and there you don't have that kind of control on it.

MR. HOWARD: You don't get it automatically. You have to ask for it.

COMMISSIONER BRADFORD: And what happens if things go wrong in two different plants at the same time? At the second plant use the telephone?

If things go wrong in two different plants at roughly the same time, does that overwhelm the --

MR. WEISS: It doesn't overwhelm the communication system. It may overwhelm the staff.

(Laughter.)

But we have several lines on the rotary which are dedicated just to those phone lines coming in from the plant.

MR. STELLO: No, Bernie. His question was if we had the NDL and an event occurred at one plant and the NDL was doing its thing, then how do you deal with having the second accident

occur now five minutes later? Can the computer take it?

CHAIRMAN AHEARNE: It's design criteria. I mean, you make a decision on what you want out of it.

MR. STELLO: We originally had in the system the capability to handle two events. To try to minimize cost we've taken out that capability simply because the cost numbers are now high.

You could design that into the system to take it. And what was the cost numbers? Is Sandia here? How much was that extra feature to handle two events simultaneously.

MR. CROPP: It was about another four or five million.

MR. STELLO: We went out and decided that wasn't a feature we wanted to add because of already the high cost. But you're right, that would not inhibit us from using the phone system to deal with two events at the same time. I don't think I'm too concerned over the issue of two events at the same time. That's one of the reasons for --

CHAIRMAN AHEARNE: But the fundamental answer is it's a design criteria.

MR. STELLO: Yes. The fundamental answer is $4 million.

MR. BASSET: It's about a linear increase in headquarters of improvement per reactor head.

CHAIRMAN AHEARNE: Right. That's why it sounds a little high.

MR. BASSET: Well, there is one thing. We provided

a redundant computer at headquarters in our original design. And that's a major part, and we took that out. So but if that were provided it would increase reliability and also be a long way towards handling two reactors.

COMMISSIONER GILINSKY: Let me understand this. Is it at all times storing 30 minutes from all reactors?

MR. STELLO: Yes.

COMMISSIONER GILINSKY: Would it make a lot of difference if it didn't have to do that for all reactors? In other words, if you simply --

COMMISSIONER HENDRIE: Sure, because you've got a big storage capacity.

COMMISSIONER GILINSKY: In other words, suppose you triggered the system by some event at a reactor and you then started storing information only from one reactor, from that one reactor.

MR. CROPP: It doesn't make a big difference, because what you're doing is storing 30 minutes of data from each reactor. You have a further requirement that when something happens, you have to store two weeks' worth of data from an individual reactor, and that drives your storage requirements, rather than the thirty minutes' storage from all reactors.

And the real problem with handling two incidents at one time is not necessarily so much data storage as it is being able to retrieve it and display it without getting (inaudible). The

retrieval and display times become limiting values, and the

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software that you need to do to provide redundancy.

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CHAIRMAN AHEARNE: Bill, can you say where you intend to go from here?

MR. DIRCKS: I think what we would be doing, as we discuss the four options, we would be thinking along the lines of Option II. That requires a burden of work on the part of Harold as far as standardizing the design features for the off-site centers. And the premise is that we'd, basically, feed off those, those off-site centers.

The work load in Harold's group, in specifying the design features for the data going into those centers in the consoles is, I guess, basically in Roger's operation, and we're talking about two to three months to get those features firmed up. We'd be able to come back, we don't have to wait for another session of the Commission in two to three months, I think we could come back in another six weeks or so with -- starting with Option II.

There may be other options, but the basic premise is standardization and -- and feed off that standardized requirement.

COMMISSIONER BRADFORD: When you talk about standardization, Bill, what will you do about Fort St. Vrain? A one-unit standard?

MR. DIRCKS: I don't know. We've only talked about PWRs and BWRs in here. I just -- I don't know how --

MR. DENTON: Haven't really thought about it. It would

have a different set of parameters of interest. It would have to be a special case.

CHAIRMAN AHEARNE: All right.

COMMISSIONER BRADFORD: Have you talked about the relationship of all this to the move?

CHAIRMAN AHEARNE: Only Bernie just mentioned that, pointed out that that was one of the issues that's going to have to be decided.

COMMISSIONER HENDRIE: I have a couple of questions.

The first one is, is it clear that our requirements for information go beyond the -- what's on the safety vector panel and will contribute to --

MR. MATTSON: I think it is. The safety vector probably doesn't have much radiation stuff on radiological (inaudible).

CHAIRMAN AhEARNE: I going to have to comment what you list in here doesn't have much radiological stuff, either.

COMMISSIONER HENDRIE: It talks about three points out of a hundred

CHAIRMAN AHEARNE: I went through, though, your list in the Sandia report, at least. I was kind of surprised not to -- well, among that list, let's look at the one that you've got at the back of that.

(Pause)

Well, I couldn't find anything, for example, I was

kind of surprised not to see some kind of a measurement at the site boundary.

MR. DENTON: There aren't any instruments.

CHAIRMAN AHEARNE: This doesn't preclude putting an instrument there.

MR. STELLO: Oh, no, no -- yes, there. Any additional instruments is a separate issue. And many of the instruments we're talking about here do not exist in all plants. One of the comments made earlier, that is a significant increase in cost to the utility, as to how even adding those that are here. Now, going beyond those, the Reg Guide 197, that's an outstanding issue; that decision hasn't been made yet.

MR. DENTON: But that issue is being considered in the context of emergency planning.

MR. BASSET: We have to allow for it in designing.

CHAIRMAN AHEARNE: I would hope so.

MR. STELLO: We have, what, up to the capability to go to 500 points per plant? As far as the NDL, that's kind of the trivial issue. It's getting the instrument there. Once it's there, it's not hard to put it into the system.

COMMISSIONER HENDRIE: Yeah, well, I remembered the list wrong, so it's useful we got that back up.

MR. DENTON: Well, it seems to me that the on-site center and the off-site emergency center, too, have somewhat differing data requirements. Or, the way it's evolved is, the

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on-site center is more concerned with the state of the reactor system itself, the off-site center would be more concerned with the environmental aspects of the accident and the need for evacuation and so forth. So we're still in the process of separating that out, as to what data is most needed where, rather than just being merely redundant.

COMMISSIONER HENDRIE: Well, I don't know, more points are nice, but it's always a question of what you're going to do with them. I can see where it'd be useful to have the vendor who is advising the utility have a list which will run like this.

If you stop and think that we now sit with one -- hopefully, one -- of our people on the far end of the telephone line and another one on this end and they talk to each other, and then the guy at this end gives a summary to Officer B, who then reports to Division Leader A, who eventually comes in and tells the emergency management team what's going on, you know, even 20 parameters direct-lined out of a plant and flashed on a screen would be, you know, if I got ten parameters would be, a staggering step forward -- and the 40, 35 or 40, that you, or 30 or 40 that you, talk about on the safety vector panel, plus just a couple of radiation levels, you know, is -- would be a monumental step forward in where we are with information now.

MR. MATTSON: The person who's controlling any evacuation or emergency steps off-site, though, would not be in the control room in the way these centers are envisioned. So the

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likelihood that the safety monitor console is going to have -- if that's where you're headed with the three dozen or four dozen parameters rather than a hundred -- it's not going to have sufficient information on it to execute those responsibilities: hence, not sufficient information for us to monitor and advise on those decisions.

That really adds a fair number here. It's 30 or so of the hundred.

COMMISSIONER HENDRIE: Well, I raise it as a question, recognizing that the associated swing in system cost between a list of thirty-odd and a list of a hundred-odd is not large.

Next question. Option II seems to come out somewhere around a $12,000,000 installation cost. That breaks out into what kind of hardware, software, and other engineering? Anybody got a, got some kind of rough numbers?

MR. BASSET: Yes. We've got about $2.1 million' worth of headquarters hardware. We have no substantial other hardware costs included the way Option number II is put up. We have a major amount of engineering involved in software of the headquarters equipment and in software interface with the center.

COMMISSIONER HENDRIE: Where do the -- do the phone lines show up in the operating costs?

MR. BASSET: They show up under operating costs.

COMMISSIONER HENDRIE: Yes.

MR. BASSET: It's about a half a million dollars.

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COMMISSIONER HENDRIE: Because they're leased lines.

MR. BASSET: And then there's maintenance on top of that.

COMMISSIONER HENDRIE: Yes. Now, what have we got in our wallets?

MR. STELLO: Three million dollars is what's in the budget for '81. Where the supplemental, which it's got a lot of -- you know -- but it's $300,000. And that, if I recover any, is for part of the study that we're doing; it's paying for the Sandia work.

CHAIRMAN AHEARNE: But the costs they're talking about are costs spread over three years.

COMMISSIONER HENDRIE: Are costs over?

CHAIRMAN AHEARNE: Three years.

MR. STELLO: Through '82. What is the '81 cost? Do you have it broken out for the 12 -- for the 11.6?

MR. BASSET: We have it about eight million in Option -- before we reduce the price to get Option I. So I would guess it would be of the order of six and a half million.

MR. STELLO: For '81.

COMMISSIONER HENDRIE: I was going to say, you tend to have pretty high first-year costs, where you have a high engineering cost and you've got to get that done.

CHAIRMAN AHEARNE: So Option I had -- yeah, it was eight million in '81, of which two million is contingencies.

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COMMISSIONER HENDRIE: So the three in the '81 budget isn't good enough, A, and, B, we're not going to get the '81 budget, in any event.

MR. DIRCKS: But would Option II come along that quickly that we'd be forced to cough up heavy front-end costs in fiscal '81?

COMMISSIONER HENDRIE: I would think so, because you're far enough away from October 1st now so that you can get a pretty good running start and do, be doing an awful lot of that engineering and so forth.

MR. BUDNITZ: You're going to have to commit the hardware in order that it get there. And you're going to have to do a lot of engineering up front.

MR. DIRCKS: Would a lot of work have to be done by Harold's group in the standardization program to get the data results through?

CHAIRMAN AHEARNE: I think realistically the answer is that the work will be phased to meet the dollars.

MR. DIRCKS: I think so, yeah. But even if it were, I think '81, we wouldn't see the major impact in '81.

CHAIRMAN AHEARNE: Well, I think Joe's point is that the dollars would be tied very tight to --

COMMISSIONER HENDRIE: I'm just wondering if the practicalities of government funding in --

CHAIRMAN AHEARNE: Remember, one of the reasons that

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dollars, where they stand, they stand there because we have a very uncertain program on which we based those dollar estimates. Those were rough plucked numbers.

Well, the reason it's three million in the '81 budget here is, you see, it's a plucked number.

COMMISSIONER HENDRIE: It's three million because you threw some number in. And I don't remember whether that was your starting number or a modification.

It seemed like a pretty good pitch at the horseshoe.

CHAIRMAN AHEARNE: It was, the number was, chosen by, I tried to guess what was the largest I could get away with.

COMMISSIONER HENDRIE: Well, question -- if we decide, as a decision of the Commission, that we're going to go down the Alternative II path, are we going to find ourselves stranded on a financial shoal here pretty quick and be unable, in fact, to execute the Commission's will?

MR. DIRCKS: I think we now may be moving ahead of where the rest of the people are. I think we, when I said Option II, we're doing some thinking, concentrating our thinking on Option II. As we pointed out earlier, Option II came along fairly -- fairly late in the process. There may be alternatives beyond Option II that we might want to take a look at, that would have cost impact downward.

CHAIRMAN AHEARNE: Also, I think that one of th aspects of Option II that hasn't been fully thougnt through is

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to what extent, if these are elements that we believe are required in order to regulate nuclear power, to what extent is that a cost to pass through to the licensee. Which is a perspective that might also assist us in being frugal in the application of what we put into it.

MR. DIRCKS: That's why I said --

CHAIRMAN AHEARNE: Yeah.

MR. DIRCKS: -- we'd be back in four to six weeks with another part, the costs.

CHAIRMAN AHEARNE: I guess, for myself, I'm -- I think that you're going down the right path. Clearly, you do have to do more work. Joe's points on the dollars are important. I think that the -- I'd like, for myself, to restress I think that that dotted line on the first chart is a very firm line and that is the perspective that ought to be taken. I think your standardization approach is right and necessary, and it's the only logical thing to try to get standardization in the approach. I would, I guess, like to ensure that as you're going down the route of looking at what kind of information you're transferring back, recall that on that chart one of the -- it's the advisory that you have that are -- and one of the principal advisory actions, as Vic mentioned, is the question of protective action to be taken. And that does require at some stage knowing something about the radiation released. And I think that you are going to have to get to 1.97 issue and you are going to have to

try to incorporate some of that data in, because, at least, from my own view, this is not a center to run the reactor, it's a center to provide the necessary advice.

COMMISSIONER BRADFORD: I agree with that -- both, what you last said and also the dotted line.

CHAIRMAN AHEARNE: And unless there are some other points, I would encourage you to continue working hard, Bill, and all these guys, pulling it together and get back to us in six weeks.

COMMISSIONER HENDRIE: Let me just add that, for myself, I think Alternative II is about the right place to go. And I probably will continue to argue with you about details, about how many of those things have to come through and one thing and another, but --

COMMISSIONER BRADFORD: Joe, how do you come out, though, on the point you raised before, which is funding it in the absence of funds?

COMMISSIONER HENDRIE: Well, I guess in a way it's a "chicken and egg" thing. If we sit here and begin to get trembly about going and doing something that without the financial worries we would think a good thing to do and we get trembly about it because the dollars, we may have trouble getting the dollars, why, that will have a large influence in assuring that our position is sufficiently uncertain so that we won't get the dollars. And I must say, it seems to me that, as I say,

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in spite of the quibbles I have about details, that this is a very desirab e step and that we ought to go forward with it and that, in fact, against the scale of the enterprise involved, the dollar numbers here, for us, in any option, or the dollar numbers for the licensees under any option, the total of it is not -- it's not a big piece of financing for the kind of enterprise that we're talking about here. And I think if we don't do a thing, I think the nuclear industry would be just as mad as a hatter not to go ahead on its own with this, at least, each vendor and his plants have one, so that, by God, if you've got a Westinghouse plant and some funny thing happens, big or small, in your plant, you jangle the bell and there are Westinghouse engine rs back there, at Pittsburgh or wherever, who are ready to bash in and run the kind of analyses that you want to have results fr m to know what to do next. And so -- and so I think the enterprise is, I think the project is a highly desirable one.

Nevertheless, the Congress is being just as mean as a coot about money, and I think we're going to have trouble producing the dollars for it, for our part of it. But I think what we ought to do is to continue to develop the det ils down the Alternative II line and, if we haven't already sort of implicitly made a decision, make it and make it explicit and just put our heads down and go for that funding. You know, I'm prepared to go to hearings and really -- well, you know, they holler at us

and holler at us, and, by George, there's no better comeback you can have than to say, you know, "I need this much money to do this. And if you won't give it to me, what right have you got to sit there and be self-righteous on the high side of that bench?" I'd be glad to say it.

COMMISSIONER BRADFORD: Intervenor funding if the Data Line falters.

(Laughter)

(Whereupon, at 11:50 a.m., the meeting adjourned.)