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NUCLEAR REGULATORY COMMISSION

In the Matter of:

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON WASHINGTON PUBLIC POWER SUPPLY SYSTEM, UNIT TWO

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON

WASHINGTON PUBLIC POWER SUPPLY SYSTEM, UNIT TWO

OPEN MEETING

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Holiday Inn
Lewis and Clark Room
1515 George Washington Way
Richland, Washington

Thursday, September 2, 1982

The meeting of the ACRS Subcommittee on Washington Public Power Supply System, Unit Two, was convened at 1:12 p.m.

PRESENT FOR THE ACRS:

M. S. PLESSET, Chairman
J. C. MARK, Member
J. J. RAY, Member
J. EBERSOLE, Member
W. LIPINSKI, Consultant
I. CATTON, Consultant
M. GRIESMEYER, Staff

DESIGNATED FEDERAL EMPLOYEE:

G. QUITTSCHREIBER

ALSO PRESENT:

Present for the NRC and Industry:

R. Auluck
A. Schwencer
F. Eltawila
R. T. Dodds

Present for the NRC and Industry: (Cont.)

A. Toth
D. Willett
W. C. Bibb
D. W. Mazur
R. G. Matlock
J. R. Honekamp
J. D. Martin
J. V. Everett
D. L. Renberger
J. E. Rhoads
R. L. Corcoran
C. M. Powers
D. T. Evans
E. A. Fredenburg
P. K. Shen
R. Johnson
B. Holmberg
D. Bouchay
R. Davidson
J. Kimball
D. Bedrosian
F. Owen
J. Sorensen
F. Markowski
S. Rifaye
T. Meade

P R O C E E D I N G S

MR. PLESSET: The meeting will come to order.

This is a meeting of the Advisory Committee on Reactor Safeguards Sucommittee on Washington Public Power Supply System Unit Two.

I am Milton Plesset, Subcommittee Chairman.

Other ACRS members present at this meeting are Carson Mark and Mr. Ray and Mr. Ebersole. We also have in attendance ACRS consultants Dr. Lipinski and Dr. Catton and Dr. Mathis -- is he here?

MR. CATTON: No, he should be.

MR. PLESSET: Oh. Well, he may be here later.

The purpose of this meeting is to begin the ACRS review of the application of the Washington Public Power Supply System to operate Unit Two and this meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act and the Government in the Sunshine Act.

Dr. Gary Quittschreiber, on my far right, is the Designated Federal Employee for the meeting. Also we have another ACRS engineer present at the meeting, is Dr. Griesmeyer on my immediate left.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on Wednesday, August 18, 1982. The rules for participation in today's meeting have been announced as part of the notice of this meeting as previously published. A transcript of the meeting is being kept and will be made available, as stated in the Federal Register notice. It is requested that each speaker first identify himself or herself and speak with sufficient clarity and volume so that he or she can be readily heard. We received no written statements or requests for time to make oral statements from members of the public.

I'll proceed with the meeting, and before going into the organized agenda, I want to express on behalf of the Subcommittee and our consultants our appreciation to the staff of WNP-2 for the courtesy and consideration they showed to us in our tour of the plant this morning.

If there are any comments from members of the Subcommittee -- yes, Dr. Mark.

MR. MARK: Mr. Chairman.

MR. PLESSET: Yes, sir.

MR. MARK: I wish to underline your comment on the marvelous, the helpful, courteous, understanding and detailed attention that we received from the people that took us on the tour of the plant. That's one thing. I believe that was very good, it was as good as it could possibly be, and I thought it was just done in the best possible arrangement.

The second thing was: what the devil is that light shining on us doing?

MR. PLESSET: That's because you didn't get enough sunshine this morning and we are trying to get you a little more tan, Carson. But . . .

MR. MARK: Must we put up with it?

MR. PLESSET: No, they'll stop as soon as we stop these preliminary --

MR. MARK: Good.

MR. PLESSET: -- considerations, if that's agreeable with you.

Mr. Ray, do you want to make any comment?

MR. RAY: I couldn't possibly top that.

MR. PLESSET: Well, it's very difficult. When we want to make a very meaningful statement like the one of appreciation, we have to rely on Dr. Mark to do it properly.

Well, I guess that takes care of the . . . Walt, do you have any comment now, and Ivan?

MR. LIPINSKI: No.

MR. PLESSET: Why don't we proceed to the agenda and I'll call on Raj Auluck of the NRC staff to give us his report. Are you organizing it for the NRC?

MR. AULUCK: Yes.

MR. PLESSET: All right, fine. Thank you.

(Pause.)

MR. AULUCK: Good afternoon. My name is Raj Auluck. I am the assigned Licensing Project Manager for the NRC on this facility, WNP-2. I would like to thank everybody on the ACRS Subcommittee for giving us permission to speak.

What I have done are on handouts given to all the members of the ACRS and I will go in order of the handout.

Before I start I would like to introduce some people who have come from the NRC. Al Schwencer, he is my supervisor. Farouk Eltawila, Containment Systems Branch. And from the region, Bob Dodds. Al Toth, he is the Resident Inspector. Dennis Willett, another inspector from the region. And we have people from Seismology and Geology here too, Jeff Kimball, Ina Alterman, and Steve Brokaum, and they'll be happy to answer any of your concerns.

MR. MARK: You referred to the region and the nice people who are involved in that region. What is the region exactly or roughly? I don't mean exactly, I mean roughly.

MR. AULUCK: Is it -- right now it's the part of the field offices. There are five regions.

MR. MARK: Oh, I vaguely understand that. But are we talking about the whole area between the Mississippi and the Pacific, or what?

MR. AULUCK: Mostly on the plans for that, because the plans are under the Region V, maybe Bob Dodds would like to take . . .

MR. DODDS: I am Bob Dodds. I am a section chief in Region V of the NRC's office. It's located in Walnut

Creek, California. The Region V office is responsible for the inspection activities in Arizona, Nevada, California, Oregon, Washington, Alaska, Hawaii and Guam.

MR. MARK: That appears to me exactly the question.

MR. PLESSET: It's not an important region. However, it's part of the U.S., Carson.

MR. MARK: Well, it's a wonderfully important region so far as the U.S. is concerned, but not so far as nuclear activities are concerned.

(Slide)

MR. AULUCK: I would like to go to our first item on the handout. That is a review and there are a few dates I would like to mention. That is the history of the project.

The first is August '71 when the application to construct Unit No. 2 was submitted to the NRC. September '72, a construction permit was -- and a supplement safety violation report for the CP stage was issued. The next item, the date is March '73 when the construction permit was issued, and the number is given as CPPR-93.

March 1977, application for operating license was tendered. And then we issued a Final Environmental Statement for the operating license in December of '81.

In March of this year we issued a safety violation report and operating license. And August of '82 we issued a first supplement to the safety violation report. And after that we are meeting today at a subcommittee meeting. The full committee will probably meet in October. And the next supplement will be issued late October or the first week of November.

And the last item in this slide is the applicant's estimated fuel load date is September 1983, a year from now.

MR. PLESSET: I might clarify this remark about the full committee, Raj. Going to the full committee primarily is on the recommendation of this subcommittee.

MR. AULUCK: Yes, I understand.

MR. PLESSET: Yes, okay.

(Slide)

MR. AULUCK: The next transparency, we have a comparison with other plants. The closest resemblance to WNP-2 is La Salle. One of the main differences is the type of containment. This is only a free-standing steel containment on domestic BWRs. It's enclosed in a reinforced concrete biological shield wall and subjected by compressed isolation material.

MR. MARK: Could you tell me or help me? This is a free-standing steel containment and it is different from La Salle, which, I believe, has reinforced concrete, perhaps with a steel liner or something.

MR. AULUCK: Yes.

MR. MARK: Is this a more rugged, more versatile, more commodious containment than La Salle, or is it more fragile?

MR. AULUCK: I think it should be as good as any other containment. It's just a different design. But it should meet - still has to satisfy all the containment indicative requirements of the NRC.

MR. MARK: Well, it has a design pressure which is, what, 45 PSI --

MR. AULUCK: 45 PSI.

MR. MARK: As does, I think, La Salle. If I push air into this containment or into La Salle containment and run it up to 45 PSI above the -- no, it's not above atmospheric, it's 45 PSI absolute. Is this containment better or worse or different, and in what way because it's made of steel? Steel is more stretchy, I think. You tell me that it's different in being steel instead of something else. From an operational point of view, in what way does one think of it?

MR. SCHWENCER: Al Schwencer, NRC staff. Dr. Mark, I am not sure that we can answer the comparitive between La Salle and the WNP-2 with respect to what their ultimate strengths are. They essentially have to meet the same requirements. Perhaps the applicant may be able to give you some comparative on why he ended up selecting steel versus the reinforced concrete. But essentially it's the same internal dimensions.

MR. MARK: I am perhaps reasonably aware of the fact they each have to meet some requirements and in this case the same requirement, but in their properties and in their nature they respond differently to things that might happen. And I am wondering if it's possible to say that have being all steel is a lot better because then, you know, if the pressure goes up to 47 PSI the steel is still is still with you, whereas the concrete is gone, and things like that.

MR. SCHWENCER: I think we would have to ask you to defer and ask the applicant that particular question with regard to the comparatives.

MR. AULUCK: Next we have --

MR. CATTON: Before you leave that previous table --

MR. AULUCK: Yes, can you put that back?

MR. CATTON: There were a few things that were part of your -- the table that you had on the SER where things -- where you were comparing one plan against another, and it shows a maximum heat flux of 428,360 BTUs per square foot hour where plants like La Salle have 361,000. It also shows a average heat flux of 163,000 contrasted with La Salle at 145,000, and the fuel max temperature is 100 degrees Fahrenheit higher than La Salle. All have the same kilowatts per foot. Could you kind of put that all together for me? How can I have a higher average heat flux yet have the same kilowatts per foot?

MR. AULUCK: Yes, we asked the applicant just before the meeting if they can find out on the differences because from the number of fuel rods and --

MR. CATTON: They are the same.

MR. AULUCK: -- fuel assemblies is almost identical to La Salle. And right now we don't have the answer, but I will --

MR. PLESSET: This doesn't say anything about the power distribution.

MR. CATTON: Well, the average --

MR. PLESSET: Axial power distribution.

MR. CATTON: The average does.

MR. PLESSET: The average is right. That's, that's right.

MR. CATTON: And the average is maybe 15 percent higher. The average heat flux on the rod is maybe 15 percent higher, yet the table says that the kilowatts per foot are the same for all of these plants, and somehow something is either wrong with the table or --

MR. AULUCK: Yes, I am going to check that table also, but the plant as such is very identical to La Salle.

MR. PLESSET: Was the -- that's . . . was that in the table here?

MR. CATTON: It was in the table that was in the

SER, --

MR. PLESSET: Not here, but in the SER, yes.

MR. CATTON: -- but it's not on the table he showed us.

MR. PLESSET: All right.

MR. AULUCK: This table is part of the --

MR. PLESSET: Yes.

MR. AULUCK: -- SER table, one part.

MR. CATTON: Which piece of the table is of interest depends on one's personal interest.

MR. PLESSET: Yes, Jesse?

MR. EBERSOLE: Can I ask a question? Yes, may I ask -- well, on the tour I noticed something that I'll inquire about here regarding the comparison with other plants. I am always looking for the motive power, the mechanical device that pumps heat out of the plant into an ultimate heat sink after it's got into trouble of some sort, like a small or any kind of a loss of coolant engine. I find in this plant I am down ultimately to just two RLR pumps. Earlier BWR designs had four smaller pumps. The original concept of the single failure criterion was having to -- had to do with simply of magnetic clutches on rods, and it dropped in, it had no time sense and depth. In the interpretation of the single failure criterion, does the staff have a practice of looking at it in time depth along the lines of, say, if I have a failure following an accident of one of the two RHR pumps and I have only one left, do I need to go in and fix the one that didn't start, or have I a point in time where I must invoke maintainability, or must I have a tertiary way of getting out of the woods, so to speak? I believe that this plant has another way of cooling the suppression pool. And, as you know, a boiling water reactor's weak point is it dumps its heat into a suppression pool and it has no exit to the external atmosphere except by coupling it with RHR pumps to a river or heat sink. The evaporative process available to PWRs is not normally available to it. I understand in this design that the ultimate intent here if you lose the RHR pumps or pump, the one that's left, that it is the intent to release evaporating suppression water from the top of the vessel. Is that true of all these? Do you have a back door?

MR. AULUCK: Yes, Supply System.

MR. NELSON: The Supply System --

MR. PLESSET: Would you identify yourself, please?

MR. NELSON: Yes. My name is Roger Nelson. I am the Manager of Licensing for WNP-2

Jesse, we will be discussing all of these elements of our design later on in our system description. So I think maybe the Supply System, we would like to defer it to us until a later time at which we will be discussing the entire subject.

MR. EBERSOLE: Is my question clear?

MR. NELSON: Yes, it's clear.

MR. EBERSOLE: My comment --

MR. NELSON: As a matter of fact, our presentation will cover the subject that you are talking about.

MR. EBERSOLE: I have seen maintainability after an accident invoked as a way to get out of the woods here, but here you have another course, I believe. But we'll take it later.

MR. NELSON: Yes, I think it would be easier. If our question -- if your question isn't addressed directly in our presentation, please ask it again.

MR. EBERSOLE: All right, then. Thank you.

MR. PLESSET: Go ahead, Raj.

(Slide)

MR. AULUCK: When we issued the Supplement SER in August and tables of outstanding issues, there were 31 issues, and these are divided in two parts. The first transparency shows the resolved outstanding issues and these are numbers corresponding to the issud number in the supplement. And the next transparency shows items which are still outstanding.

MR. CATTON: Before you leave that one, could you put that back? Number -- I don't understand why No. 7 is still a concern.

MR. AULUCK: No, I said these are resolved.

MR. SCHWENCER: Resolved.

MR. PLESSET: Those are resolved.

MR. CATTON: Oh, I see.

MR. PLESSET: Those are resolved.

MR. CATTON: Good.

(Slide)

MR. AULUCK: The next one is the -- shows the number of remaining outstanding issues. Among these, No. 3, 4, 8, 10, 21 and 31 are still under NRC review, so we will report the resolution of those in a supplemental SER. But I will go over one by one on all these outstanding issues.

MR. RAY: Raj, you have it labeled "outstanding issues." Are there any real issues, or is this just a matter of subjects that need to be confirmed?

MR. AULUCK: No, there are no real issues.

MR. RAY: There's no disagreements fundamentally?

MR. AULUCK: There are minor disagreements.

MR. RAY: Thank you.

MR. AULUCK: No disagreements which cannot be resolved.

MR. EBERSOLE: In Item 4, regarding the disadvantageous orientation of the turbine missiles, is it a standard requirement that you impose, design requirements associated with the turbine rupture speed of 180 percent, plus or minus?

MR. AULUCC: Yes, right now this item is under review, especially in this case where the turbine is in the nonperfect position. And --

MR. EBERSOLE: Well, there --

MR. AULUCK: -- we have been giving stress to a new procedure of review and not relying on the old procedure where you are merely talking on the property of the strike. And that --

MR. EBERSOLE: Well, do you consider the strike velocity as the 180-percent-odd failure point of the turbine, not the 110 or thereabouts?

MR. AULUCK: I cannot answer that for the . . .

MR. EBERSOLE: Well, sometimes people invoke a exotic control scheme on the thesis that they can control the problem, but that always leaves you with the mechanical function of the actual valving in question.

MR. AULUCK: Yes, under the new procedures the most stress is being -- were given to the vendor to come up with the property of the missile being ejected, so then we try to relate it to this.

(Slide)

Internally Generally Missiles. Applicant has --

MR. CATTON: Before --

MR. AULUCK: -- not completed the study yet.

MR. CATTON: Could I ask a question first? Earlier, I think on the SER you listed channel box deflection as being an issue. Has that been settled?

MR. AULUCK: Yes. It has been just resolved recently, and . . .

MR. CATTON: I have a question out of ignorance. I understand how the channel box deflection question is faced. You make your tests and when the rods won't fall because of friction, you decide that, gee, it's time to do something. That seems like a reasonable thing. On the other hand, if your interest is fuel box lifting, you tend to approach that separately and you don't concern -- it seems to me that there is no consideration given to the fact that the channel box may be deflected and that a given delta-P across the channel may put more force between the cruciform and the box wall. Could you sort of clear that up for me?

MR. AULUCK: I -- G.E. came with a study and the NRC has reviewed it.

MR. CATTON: I took a look at some of that and it seemed to me that they had taken the two questions and done -- and in separate hands looked at them. One was the channel box deflection and how they would recognize it, and the other was is if everything is just fine, what would happen if we had a LOCA and had the pressure so that would push the channel box wall against the cruciform.

MR. EBERSOLE: Yes, I agree with --

MR. CATTON: But you didn't take the case where you had the deflection that you were testing for simultaneously, in other words, near the point that you would be getting some rubbing between the two, then have a LOCA. You understand --

MR. AULUCK: Yes, I see.

MR. CATTON: -- my concerns?

MR. AULUCK: I think I have it correct.

MR. CATTON: I have looked at both reports. Neither one seems to be related to the other.

MR. EBERSOLE: The post-LOCA case refers to a clean square box.

MR. CATTON: That's right.

MR. AULUCK: Is anybody from G.E. here?

MR. NELSON: Maybe he is here, but I can't see him. We just talked to him. We are not ready to answer that.

MR. AULUCK: Then you basically don't --

MR. NELSON: We would like to defer it and we will answer it at a later time, if we can, please.

MR. CATTON: Okay, fine.

MR. AULUCK: For that question?

MR. PLESSET: That's okay.

MR. CATTON: I just want to get the questions out.

MR. NELSON: Yes. Well, we'll try to get a response to you certainly before the meeting is over.

MR. CATTON: Good.

MR. AULUCK: Now, in this case the study is still incomplete and applicant is scheduled to submit to NRC the complete report by October '82. So we will report that information in a later supplement.

MR. EBERSOLE: A related matter to this but one not listed is the hit and blast effects that are associated with missiles. You don't have it listed. I would like to ask you, have you made a methodical study of the control rod drive and exhaust tube routings and the aspect of potential jet and blast forces, with the thought in mind that you can only tolerate a very limited number of rod failures to insert as to a LOCA, probably about four?

MR. PLESSET: I think the applicant has been made aware of this, Jesse, and maybe they will be able to comment on it before the meeting is over.

MR. EBERSOLE: Um hm. All right.

MR. PLESSET: I think they understand your problem.

MR. EBERSOLE: They do.

MR. PLESSET: Is that correct, sir?

MR. NELSON: I'm sorry.

MR. PLESSET: Mr. Ebersole raised a question of damage to the control rod drive lines as a result of failure in other high pressure lines in the area.

MR. NELSON: Yes.

MR. PLESSET: Remember we talked about this.

MR. NELSON: We did.

MR. PLESSET: Will you be able to say something about this?

MR. NELSON: Yes, we will.

MR. PLESSET: All right.

MR. NELSON: We have --

MR. PLESSET: So we'll defer that also.

MR. EBERSOLE: Sure

MR. PLESSET: All r:ght?

MR. EBERSOLE: I'm just letting it out so we --

MR. NELSON: We'll have somebody look at it. We have someone here at the meeting that is present --

MR. PLESSET: Okay.

MR. NELSON: -- and can address that.

MR. PLESSET: So we'll go on.

MR. EBERSOLE: Sure.

MR. CATTON: One more thing before you leave this. I noticed that in the SER that you would do a report on ICCS instrumentation and in -- it was due July '82 from the applicant, and it was going to address various questions like in-core thermocouples, and so forth. Have you received that report?

MR. AULUCK: Yes, can you --

MR. NELSON: The NRC has not received the report yet. The report is complete. It's under review by the owner's group right now and the scheduled -- the new scheduled submittal date is September, end of September. It is -- it is complete now and it's under final review for submittal.

MR. CATTON: I guess I have jumped the gun. That's -- that was a licensing issue or something, wasn't it?

MR. NELSON: It was.

MR. AULUCK: A licensing issue.

MR. CATTON: Okay.

MR. NELSON: It was.

MR. PLESSET: Go on, Raj.

(Slide)

MR. AULUCK: Okay. The next item is the tornado missile protection for the diesel generator exhaust. We have received the applicant's response to it, and -- which is different from what we are requiring from our branch technical position's standard review plans. Applicant believes that since the probability of a tornado of sufficient velocity to lift large and heavy missiles which is almost 1000 feet away is very small, and it's very unlikely that it will plug the diesel generator exhaust, so there should not be any protection needed for this exhaust. We have suggested that applicant can provide some additional controls, and applicant's position is that those controls are also unnecessary. This is still under our staff review and we are going to meet with the applicant soon to resolve this issue.

(Slide)

MR. AULUCK: As I mentioned earlier, this issue is still under review and will be reported is a later SER. Applicant does not owe us anything in this area. Anybody have any questions? Next, please.

(Slide)

MR. AULUCK: Electrical Equipment Qualification. Here they are talking about environmental equipment qualification and seismic audit. Applicant is proposing to submit both the reports by the end of September, and we plan to do the environmental audit in the end of October and the seismic audit towards the end of November.

MR. CATTON: As part of your audit, do you take a walk through the plant to ensure that there is no electrical equipment that is in any way going to be affected by a flow?

MR. AULUCK: We do the audit on a sample basis. We . . .

MR. CATTON: So you don't have a plant walk-through?

MR. AULUCK: We have a plant walk-through, but we also asked the applicant to provide all the details for certain systems, certain components.

MR. CATTON: Has anybody walked through to make sure that there isn't a piece of equipment just through a doorway, or something, where there might be flow as a result of a line break? I am concerned about a little bit more than direct jet impingement. I am concerned about having a doorway somewhere where you'll have flow through it that would cause vibrations in equipment on the downstream side. Do you check to see that that's not the case?

MR. AULUCK: Bob, could you answer?

MR. DODD: Pardon? I was writing down -- making some notes on this. Could you restate the question?

MR. CATTON: What I am wondering is that as part of your electrical equipment qualification do you do a walk-through of the plant to make sure that you don't have any equipment that's sitting somewhere where there may be flow as a result of a line break, and I mean more than just jet impingement, but indirect flow, like if you have a doorway to the room where a line break may take place, do you have anything that's just outside that doorway that may be affected?

MR. AULUCK: It's usually not a part of the audit --

MR. CATTON: I can't hear you.

MR. DODDS: I would --

MR. CATTON: I would be willing to wait for the answer to that.

MR. PLESSET: You want to give it later or you want to answer now?

MR. DODDS: The region --

MR. PLESSET: If you want to answer, use a microphone.

MR. DODDS: The region has not --

MR. PLESSET: Use a microphone, please.

MR. DODDS: -- made it a part of that audit team and I have not been involved in any of these audits, so I can't specifically answer your question.

MR. AULUCK: I will check on it, but I believe the audit team does not go through checking those -- any obstructions on the way.

MR. CATTON: I really think they ought to.

MR. SCHWENCER: Well, Al Schwencer. The main thing that the electrical equipment audit does is to check to see that the equipment was procured and is fully qualified for all of the ambient conditions that it's expected to see. Now, there are -- there are degrees of it. Those that are in the most harsh environment have to be qualified to the temperatures, pressures and radiation that are involved. There is -- there certainly is another element of the staff's review, and this is the high and moderate energy line breaks. Those potential line break areas are looked at. Then another cross-cut on this is from the fire protection point of view where it's conceivable that the sprays from a fire protection could wet down the equipment. So I am not sure that there is a nice clean answer in terms of this is a -- I guess you would say it's a unwanted systems interaction that you are concerned about that could happen.

MR. CATTON: I am concerned that most of the time electrical equipment qualification is autoclaved at pressure, temperature and humidity, and I think a little more is needed. And I am just wondering if it's done, and I get the feeling it's not.

MR. PLESSET: Carson --

MR. DODDS: With respect to the regional inspection program for electrical equipment qualification, we do audit to see whether or not the equipment has been qualified, that is part of our routine inspection program. But to specifically look for what you are asking, that may well get picked up as a part of our independent inspection effort, and I am trying to think if that's happened. I know we have raised the question aside from a routine program with respect to the flow, but not specifically, I think, to the type of missile.

MR. PLESSET: Okay, thank you. Mr. Ray wants to make a comment.

MR. RAY: On your comment or your response, the audit that the inspection role makes on the adequacy of qualification is a matter of document and record, is it not, rather than inspection?

MR. SCHWENCER: Yes, sir, that's correct.

MR. RAY: What you are saying is that there ought to be a more physical inspection in more depth.

MR. CATTON: That's correct. If -- I keep repeating the same example, which is the HDR reactor in Germany where they set out to run a test and they were going to test steam isolation valves and instrumented the place, it was a beautiful experiment. They ran the experiment and all the instrumentation went to hell because there were effects at a distance. When steam goes out of a room and goes around the corner, it wreaks havoc with anything that's there, and if you don't look for that, you miss it. And I don't see anywhere in the NRC equipment, electrical equipment qualification standards, or anything, that it's required that they do this.

MR. RAY: It isn't there.

MR. CATTON: If you don't do it, it could be that it's a far more severe impact on the equipment and that autoclaving just doesn't do it.

MR. EBERSOLE: Mr. Plesset. Along that line, you know, the boiling water reactor's claim to fame is it's got so many ways of putting water in on the core, so it advertises that as being much better than the pressurized water reactors. However, that's based on the premise that you can get the pressure down. In the limiting -- in the safety grade cases, there's really only two safety grade ways of putting high pressure water in this reactor. That's the diesel-driven HPCI and the RCIC. The requirement if you lose those, and one of them, at least, is rather nervous, you have to blow down. Your blowdown is accomplished by some of these environmentally qualified gadgets, the SRV solenoid valve, and that is type-tested by the electrical industry. Well, type-testing raises an ugly question in the first place, is type-testing really adequate, because subsequent product lines have to have an absolute uuiformity of the production process to ensure you are going to get a replica of the tested product. I am not sure that the QA, what with QA being what it has been, ensures that you get a perfectly replicated product. I would certainly think, if it were my reactor, I would look individually at every one of those, D.C. hot-actuated, they are zero voltage to fail, they are high voltage to work, to see that I had in fact a guaranteed mode of de-pressurization. I acknowledge you can get only two of these to work out of a large number and you are all right. But there has been a knowing suspicion that you should have other ways of depressurizing the -- or your, this reactor than by depending on solenoid valves inside a hostile environment. So I suggest you take a real hard look at that particular environmental qualification problem.

MR. AULUCK: I agree with you.

MR. PLESSET: Dr. Mark.

MR. MARK: This really goes back to either the last slide or the one before the last side, the turbine missile.

MR. AULUCK: Turbine missiles?

(Slide)

MR. MARK: Right. 3.5. 1.3. It seems to me that that really is perhaps not unique here, the generator and its placement and orientation is unfavorable. That has happened before. Is it particularly objectionable here, or is it something we have swallowed or gone ahead with in other places? I am wondering why is it now an issue?

MR. AULUCK: Well, now, the issue is because we are changing the review procedure.

MR. MARK: But are there plants in which the same problem is just as prominent?

MR. AULUCK: Yes.

MR. MARK: And in this plant we are looking at it because it is indeed a question. It hardly seems to me that it's likely that this is unique to WNP-2 and that the solution, if it requires a solution, doesn't specifically and only apply to this plant.

MR. SCHWENCER: Raj?

MR. AULUCK: Yes.

MR. SCHWENCER: I'll speak just briefly to that. I agree with you entirely that it's not unique. The orientation of this turbine is similar to many that have been built and that are currently operating, and I have no doubt that the matter will be satisfactorily resolved. The emphasis that Raj has been speaking about is that the staff is attempting to place more emphasis on the long term inspection and making sure that rotors are -- the rate of crack of propagation is sufficiently well characterized at the beginning of life so that appropriate inspections can be made frequently enough throughout the life of the plant that we can maintain a high degree of confidence that the probability of failure will stay within the bounds that we expect it to be when the plant's first started. Now this requires that we obtain additional information, more than we have generally in the past, from the turbine manufacturers themselves on the properties of the materials and the inspections, and the capability of doing it. And, as Raj has indicated, the staff has received the information that it believes it needs to complete this work and it's currently under review. But we would not characterize it as a major problem for this plant uniquely.

MR. MARK: Are you telling me then that it's something which can be addressed by procedural remedies in this plant, which perhaps also ought to be applied in other cases, but that it's not really a new thing?

MR. SCHWENCER: Yes.

MR. EBERSOLE: Al, in this connection, what you say suggests you are just dealing with that component of the turbine missile problem associated with failure at near-synchronous feed, because that's all you'll see when you inspect it, whether the rotor is good enough to give you a reliability number so as not to fail at synchronous speed. There is a speed, of course, at which it will come apart, normally called about 180 percent.

MR. SCHWENCER: I am not sure I can answer you in terms of the quantitative 100 percent, but the staff will be looking at the properties of the material, the crock -- the crack propagation --

MR. EBERSOLE: Yes.

MR. SCHWENCER: -- characteristics. And we'll also be looking at the means of overspeed protection and making sure that that's appropriately surveilled during the life of the plant. I can't tell you off the top what the overspeed protection limits are for this plant, but whatever they are, we do require that they go up to that in calculating when the applicant and the turbine manufacturer calculates the stresses. We do need to know what those stresses are that they would reasonably expect to see at the point that you would -- you would hit your overspeed protection.

MR. EBEROOLE: What I am saying is, if you lock up the stop valve and the control valves so they remain open, you will fail inevitably. I don't care how good the metallurgy is, and you'll fail at a very damaging speed because there is -- the only terminus to this accident is when the turbine comes apart. The question is: what's the probability of that?

MR. SCHWENCER: I think the probability is --

MR. AULUCK: Westinghouse --

MR. SCHWENCER: -- is taken into account.

MR. AULUCK: Westinghouse is recommending a generation of missiles, a probability for generating missiles of destructive overspeed as 1.7×10^{-6}.

MR. EBERSOLE: That's destructive overspeed.

MR. AULUCK: Destructive overspeed.

MR. EBERSOLE: Is that -- I guess that's low enough to live with.

MR. SCHWENCER: I think that sounds typical.

MR. EBERSOLE: How reliable is that and on what basis? We were -- had a talk at the turbine standard on this trip. We drew the analogy that it looked like the BWR scram system except it was a hydraulic dump system and there were plenty of ways that you could probably valve out the discharge or have a closed volume, except somebody said it was an open tank. But there is a distinct analogy between this dump system and that of the rod system. I think you better open the black box at the end of the turbine standard and see how the oil is dumped before we start developing statistical numbers based on past experience. We just need one case to be in trouble. We don't, I don't think, ever open that can of worms at the head of the turbine and determine to our own satisfaction how reliable the hydraulic dump system really is.

MR. MARK: I guess --

MR. NELSON: Milt -- pardon me, please.

MR. PLESSET: Yes?

MR. NELSON: Can I make one -- I have had a request from the audience to -- if the members of the panel would please speak into the microphones. Apparently they are having a hard time hearing you in the back. If you would, please.

MR. PLESSET: Well, I was going to urge the members up here to moderate their enthusiasm and interest because we are running way behind. Dr. Mark, if you have a very weighty question --

MR. MARK: I won't run you very much further behind, sir.

MR. PLESSET: But he will.

MR. MARK: This question of the turbine missiles, however, is it viewed by the staff as something which can be handled by inspection and surveyance, moves of that sort, or does it require or is it likely to require a plant change?

MR. SCHWENCER: At this point we do not believe a plant change will be required.

MR. PLESSET: All right?

MR. MARK: Yes, sir.

MR. PLESSET: Raj, it's yours to go on.

MR. AULUCK: Next transparency, please.

(Slide)

MR. AULUCK: The next item is pressure interlocks on emergency core cooling injection. The staff's concern here was that the design prevents injection valve opening when delta-P across the valve exceeds approximately 750 PSID. That could be a stage where the check valve fails. This low-pressure EECS piping will seal the high reactor pressure vessel. So to eliminate that, Supply System has committed that this valve, motor-operated valve will open on the reactor pressure rather than the differential pressure across the valve. So they agreed that they'll make this modification not until the first refueling, which is under review. The staff is asking to do it earlier, but we have not made the decision on that.

(Slide)

MR. AULUCK: Modifications of ADS logic. WNP-2 is part of the BWR owners group and they are planning to submit its position in October '82, and Supply System intends to follow that. So we'll take action after reviewing their input.

(Slide)

MR. AULUCK: Standby Service Water System I&C Design. The standby service water system is controlled using multiplexed signals to operate associated pumps and valves. This is a redundant system. The staff has received all the information and we are reviewing it, and we had some more questions, and applicant has submitted all the information. So we'll report of a resolution in the next supplement.

MR. EBERSOLE: May I ask a very quick question?

MR. PLESSET: Sure.

MR. AULUCK: Please do.

MR. EBERSOLE: Did the ask the question of why is this fundamental system, which is the final coupling to the ultimate heat sink, be complexed by such a thing as a system like this. Fundamentally it would appear to be very -- it could be very simple, and it is the ultimate connection to the heat sink.

MR. AULUCK: Yes.

MR. EBERSOLE: Why is the complications of multiplexing even admitted for a review? It gets back to the fact that the staff appears to be willing to review virtually anything without asking why it is what it is.

MR. AULUCK: No, we asked a lot of questions and --

MR. SCHWENCER: Raj.

MR. AULUCK: -- especially this is the first time the . . .

MR. SCHWENCER: I guess I would just interject, Mr. Ebersole, that we review this on the basis that it's not a forbidden thing. We have to look at designs that are proposed to us to decide whether they are safe, not whether they are optimum. Our hands in our regulatory role are tied to some degree as to how much we can dictate design. I agree with you this is very unique to have this multiplexing system rather than a hard wire between here and there, and, as you can see from the -- Raj's write-up here, we do have this concern about is there any common mode that could wipe out the multiplexing between the plant. And we -- it is under review. We have not said "No."

MR. EBERSOLE: Well, I would like to propose an investigation be started as to why you are obligated to accept virtually any Goldberg scheme that's brought to your table. I think you should have a prerogative of saying "I refuse to investigate Goldberg schemes" on some grounds, one being common sense and reason.

MR. SCHWENCER: Well, multiplexing is not Goldberg. It's a proven --

MR. EBERSOLE: Right.

MR. SCHWENCER: -- technique. In this case it is unique.

MR. EBERSOLE: The question is: is it needed?

MR. AULUCK: It's the first nuclear application and the applicant believes it's a better system.

MR. PLESSET: Go on, then.

(Slide)

MR. AULUCK: Control System Failures. The major concern here is that if two or more control systems receive power or sensor information from common power sources or common sensors, failure of these sources or sensors or rupture/plugging of a common impulse line could result in event sequences more severe than considered in the plant safety analysis.

The applicant is performing a study result, and they will do the necessary modifications, if required. We will wait for their study in December and we'll take action accordingly later on.

MR. EBERSOLE: The scope of that issue is limited to two or more control systems. Will you please extend it to control and safety systems intermixed with the same sensor information, because that's a limited scope study. If I have any mixture of a control system and a safety system actuation, for instance, from the same impulse or static line, I may have a worse problem than this. That's control systems.

MR. AULUCK: Yes, yes.

MR. EBERSOLE: And I think, as a matter of fact, you may find we have certain cases, or we have had in the past, where a control and a safety system look into the process through a common sensing line and it produces degrading effects that leave you without redundancy in the mitigating functions. So I would like to request you extend the scope of that.

MR. SCHWENCER: Mr. Ebersole, my understanding that the staff's review on the safety systems, they do look at the isolation or the coupling between safety and control systems. This was intended to be something in addition to that that, I believe, if I am not mistaken, Westinghouse brought this to the staff's attention at some time in the past, that looking at an inadvertent performance of a control system, it could in some way perturb. And this caused us to ask, and we ask this on all applications now, are there any ways where the control systems could have consequences more severe than we have considered in a plant safety analysis. So I look at this as something in addition to the safety control separation criteria that we have, to my understanding, have always looked at.

MR. EBERSOLE: Al, I think we have looked at it in the electrical context only. We have not looked forward of the transducer into the impulse line designs.

MR. SCHWENCER: Yes, I am aware of the sensing line concern that you have on that.

MR. EBERSOLE: This is precisely what I am talking about here.

MR. SCHWENCER: Yes. Okay.

(Slide)

MR. AULUCK: Criteria for Testing Hot Pipe Containment Penetration. We had a discussion with the applicant earlier this week and we were informed that since it is a steel containment, they do not have to perform this testing. We have asked for more justification and then we'll see what we will review it and report our resolution. Since there is a -- a degradation of the concrete doesn't affect the integrity of the containment, they said they do not have to perform this test.

(Slide)

MR. AULUCK: The next one, Emergency Planning Program. The applicant has submitted their emergency planning program for the onsite and corporate activities only. Off-state and local entities within the emergency planning zones have not submitted their plan. So once we receive those plans, the NRC will take further action at that time.

MR. MARK: What groups, entities, agencies must one deal with in this connection?

MR. AULUCK: Is there --

MR. MARK: Here we are in the middle of a federal reservation. The nearest thing is Richland, as far as I know. What people must be involved to fill in what you say is lacking?

MR. SCHWENCER: Dr. Marks, I understand the applicant is prepared to discuss that in some more detail later in the meeting today or tomorrow.

MR. MARK: Just fine.

MR. AULUCK: He is the first agenda item tomorrow morning.

(Slide)

MR. AULUCK: Control Room Design Review. Applicant will submit to us the complete report in March of '83. They are waiting for the generic report by BWR owners group in January of '83. So --

MR. CATTON: Wouldn't it be more appropriate to speed that up in that the control room is being put together right now? If you wait until March of '83, it will be finished.

MR. AULUCK: I think they are in contact with the owners group, so I suppose they are looking at a draft of that report. Am I right?

MR. NELSON: I can answer that. The owners group has now just had an interface with the NRC staff on their review of the owners group report, which we are a part of. When that report is finally approved by the NRC, we would use it as part of our plant-unique report. So in conjunction with that we also are -- would be involved with an owners group visit where they would come and do the human factors review of our control room prior to our issue of our report as well. So that -- and that won't occur until January, so that's where the March comes in. And that still is -- it should be in plenty of time for the staff to complete their human factors review before fuel load in the criteria that we have agreed to.

MR. CATTON: I am just a little bit -- I am just interested in what good a review is going to do six months from now when right now you might be able to change something.

MR. NELSON: Yes, maybe we -- yes, the answer is that we don't anticipate that we are not following the guidance that we expect the staff to have in the final form anyway. We work on a very close basis with the staff as well as the owners group, and the staff works with the owners group, so we feel that when March comes there won't be any surprises for either the staff or us.

(Slide)

MR. AULUCK: ATWS. The staff presented its recommendation on plant modifications to the Commission in September of '80. The Commission will determine the required modifications to resolve ATWS concerns as well as the required schedule for implementation. In the interim, the staff is requiring the applicants to develop emergency procedures for this event, and applicant will provide such information in their March '83 submittal.

MR. LIPINSKI: I have a question on that. As part of the fix, a recirculation pump trip has been incorporated and it's part of this plant design. One of the issues that was never answered satisfactorily was what happens to reactor power if you leave the rods fully withdrawn and coast those recirculation pumps to where the power drops off to 20 or 30 percent. There is still an issue with respect to core stability as to whether that core chugs or not, or whether it operates stably with the rods fully withdrawn. Is the staff going to have an answer to that?

MR. NELSON: No, that's -- that will be part of our final ATWS. But, no, we are not prepared to address that. We can look into it, if you wish us to.

MR. LIPINSKI: Yes, but right now you have committed yourself to running your recirc pumps back, and the question is: what happens to your core if you are at a 100 percent power and you roll those pumps to where you are going to coast down to 20 percent power. How does that core operate?

MR. AULUCK: Will you take it tomorrow?

MR. CATTON: And to add a little to that, under thermohydraulic evaluation findings it says you are not to use the natural circulation mode, so how the hell can you trip the pumps?

MR. NELSON: Okay. I think maybe it might be more appropriate, again, I don't want to keep putting you off, but we are going -- or at least we'll have the right people available to discuss various aspects of the plant operation and system design during our portion of the presentation. It may be inappropriate to answer it here because we want to make sure the right people are answering the questions. So

I am not saying we are not going to answer it, but I think it may be more directly and more easily answered by the right people during our portion, if that's acceptable. We'll have the right guys here.

MR. CATTON: We won't let you forget it.

MR. AULUCK: Next one, please.

(Slide)

MR. AULUCK: TMI Item, Containment Isolation Dependability. And here we are -- our concern was mainly the operability of the purge valves only. The staff's position was that the performance and reliability of purge system isolation valves should be demonstrated under conditions similar to those existing in the containment following onset of a LOCA. The applicant is waiting for information from the vendor and plans to submit the information to us in October of '82.

(Slide)

MR. AULUCK: Pipe Break in the BWR Scram System. By NUREG-0803, it's the "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping." The concern was that -- the report states that pipe breaks in the control rod drive hydraulic system and the resulting environmental effects should be verified on a plant specific basis. The applicant has responded to our concern, and, but -- and we have asked some more questions, and the response is expected in October. It was the break in the CRE piping between the penetration and a closed isolation valve.

(Slide)

MR. AULUCK: The next one is "Steam Bypass from a Stack Open Wetwell-to-Drywell Vacuum Breaker." As you know, this was -- this concern was raised by the ACRS last year. Due to this large delta-P developed during the chugging phenomenon, the vacuum breaker may open, and since the cycle is repeated every two seconds, the vacuum breaker may be called upon to function in a cyclic manner. There is a possibility that failure of a vacuum breaker to close this -- during this timeand could result in a steam bypass of the pool, and just the integrity of the containment may be breached.

The applicant has indicated that he is participating in a valve qualifications program and considering design modifications to resolve this concern. The applicant has Anderson-Greenwood valves and they are proposing to add some kind of a damping device to the valves to help with this concern. And information -- I think they will be installed by the fuel load, so which is a year away.

(Slide)

MR. AULUCK: The next one is the "Heavy Load Handling System." As part of the NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," which provides guidelines to ensure safe handling of heavy loads. The staff identified a number of measures dealing with safe load paths, procedures, operator training, and crane inspections, testing and maintenance. Applicant responded to us, addressing the concerns in this report and there were some questions we had, so, and which the applicant is working on now. And the response is expected again in October of '82.

(Slide)

MR. AULUCK: Sprinkler and Standpipe System. Most of thes automatic sprinkler systems are designed to the provisions of NFPA Standards 13 and 15, and there were about 15 which required this cable protection to ensure forest fire shutdown capability. Of those 15, the applicant stated that 12 areas have fire loadings of less than a half hour, and 7 of these 12 have fire loadings which correspond to less than a quarter hour, which the staff accepts and the deletion of the automatic suppression system from those areas. The justification for deletion of this automatic suppression system in the remaining other five areas is still under review.

That pretty much closes the -- all the open items, and we have the confirmatory issues which are shown on these next two transparencies.

(Slide)

MR. AULUCK: Most of the information on these will be coming in the end of this year. Item Nos. 1 through 7, the information will be submitted by December. Item 9 through

12, they are part of the G.E. input and reported only in-house, and the NRC is reviewing them. On Item 13, 14 and 15, is March of '83. 17 is September and 18 is due in before plant operation.

(Slide)

MR. AULUCK: The last one, design-basis volcanic ash, this was raised recently. U.S.G.S. estimated that the design ash-fall conditions, a little higher than what the applicant reported in the FSAR. They said the compressed thickness of the ash fall could be as high as seven inches and with the FSAR stated that the plant is designed for a 4.2 inches or so. We have had discussions with the applicant and they are looking into it and will report the evolution to us. We are asking them to look, that it affects the design of the plant.

MR. CATTON: What does the ash do to the --

MR. AULUCK: Volcanic ash.

MR. CATTON: -- spray ponds?

MR. AULUCK: Mount St. Mount Helens.

MR. CATTON: I can't hear you.

MR. AULUCK: St. Mount Helens eruption.

MR. CATTON: Oh, I -- what does it do to your spray pond?

MR. LIPINSKI: It covers it with dirt.

MR. AULUCK: It will collect at the bottom of the pond.

MR. CATTON: Oh, so when it wets, it sinks.

MR. AULUCK: Wets and sinks, it's heavy. And applicant is looking at all the systems which will be affected, and if they are affected, proper action will be taken, modifications will be done.

If you have no other questions, that will be all.

I would like to add another point here. We learned a couple of days back that their management has been reorganized, the corporate management of Supply System, and I believe they will discuss the new organization today. So what I will be having in the SER will have to be looked and we'll have to amend our SER sections in those areas.

MR. PLESSET: Very well, thank you.

Al, do you have further . . .

MR. SCHWENCER: No, no further comments to add, Dr. Plesset.

MR. PLESSET: Is this the time when we have the I&E report?

MR. SCHWENCER: Yes, Mr. Robert Dodds from the region will make that presentation.

MR. DODDS: I am Bob Dodds. I am the Section Chief in Reactor Projects Section One, responsible for the inspection program that's being conducted on the Supply System projects and the progress of.

In the region presentation, I'll discuss the construction status. Al Toth will discuss quality assurance. I'll give you a brief summary of the history of management, and then Dennis Willett will discuss the project from the operations end of our business, where he is involved in the startup testing program and review of the plant operating staff's training, maintenance, and etc.

The construction is about 91 percent complete. Supply System is geared for an active construction completion and preoperational testing program to support fuel loading in September 1983. The major milestone to support that goal is the successful completion of the hydrostatic pressure test with the primary system last Friday, August 27th. That's about where we are today.

Electrical installation is greater than 90 percent complete. However, the installa -- in our view, the installation practices do not in all cases appear to meet the NRC guidance to Reg Guide 1.75. Deviations have been identified in the areas of physical separation, electrical isolation of associated, and the identification of Class 1E and associated circuits. Justifications for specific deviations are the subject of discussions between us, NRR, and the licensee. We are hopeful that these issues will be resolved shortly, enabling us to complete the inspection program in these areas.

With that brief introduction, I would ask Al Toth to come up and give you our synopsis of the quality assurance program from the beginning of construction to date.

(Pause)

MR. TOTH: The construction permit for the project was issued March 19th, 1973. In mid-1976 weaknesses were observed in the performance of the Supply Systems quality assurance program. Our routine and special inspection findings eventually led to major enforcement action and a civil penalty in mid-1980. That enforcement and the corrective action history includes the following items.

You'll have to pardon me. My contact lens just slipped, it had some dirt in it.

In July 1976 the construction was reported as 35 percent complete. At this time our inspectors identified deficiencies in the QA program for the contractor of the sacrificial shield wall. This resulted in an issuance of a notice of violation, and in November we found that the Supply Sytem's corrective action did appear to be acceptable.

Almost a year later, in February 1977, the Supply System reported a cracked weld in the sacrificial shield wall and in December of 1977 the Supply System reported some cracked welds in the radial beams which connect to the sacrificial shield wall. Our inspectors monitored the Supply System's corrective actions.

In 1978 February the Supply System reported some apparent weld record falsifications. The NRC follow-up inspections confirmed that there were weaknesses in the Supply System quality assurance program, and in May of 1978 we held an enforcement conference and issued an immediate action letter confirming the commitments which the Supply System had made to us regarding corrective actions. And our inspectors again monitored the corrective actions taken by the Supply System.

In April 1979 the NRC requested the Supply System to take further steps to improve the quality assurance program since our inspectors had identified nine violations in the first three months of 1979. The Supply System submitted appropriate commitments to us in May.

In the next months the NRC received and investigated several allegations of improper work on the sacrificial shield wall and the pipework supports. During one of the special inspections, the NRC inspector questioned the separation between rings No. 3 and 4 of the sacrificial shield wall. Subsequent investigation by the Supply System disclosed that these rings had not been welded together, but rather the welding had been to shims which had been used to adjust the attitude of the rings. The shims were installed between rings 3 and 4. At this time, the Supply System stopped work on the sacrificial shield wall and on the pipework restraints. The NRC issued an immediate action letter to assure the NRC review of the corrective action plans prior to the restart of work on those structures.

NRC inspections then through February 1980 identified another 20 violations which resulted in our initiation of escalated enforcement action. In June 17th, 1980, the NRC issued that escalated enforcement action, a civil penalty and a special request for detailed information. The NRC requested that the Supply System provide information to confirm that the prior completed safety-related work meets the requirements and that future work will meet requirements. The Supply System was requested to report the results to NRC and to define measures for assessing the quality assurance at other Supply System facilities based upon the lessons learned at this project.

During the period that the enforcement action was being formulated, our inspectors were investigating allegations regarding various quality assurance program discrepancies by the mechanical contractor. This investigation was conducted between June 1st and July 25th in 1980. It resulted in the identification of 12 violations and numerous questionable items. Also in June a major labor strike occurred which essentially shut down all the construction activities at the site.

On July 17th of 1980, the Supply System submitted its corrective action plan. These included work method and records reviews and hardware reinspections. The Supply System stated that the site contractor work had been stopped and that the mechanical contractor would not be permitted to restart until a special management re-evaluation by the Supply System had been completed. The NRC requested review of that re-evaluation and the corrective action plans prior to the start of work. At this time an NRC inspector was assigned to the project site on June 25th to monitor the details of the corrective action programs.

On January 20th, 1981, the NRC concurred with limited restart of work to repair the weld of rings 3 and 4 of the sacrificial shield wall. The general release of work was not issued until May 31st, 1981.

On June 1st of 1981, the Supply System implemented a major corrective action in the designation of Bechtel as the construction manager and the Supply System's completion contractor. Shortly thereafter, the Supply System relieved the mechanical contractor of future and further hardware work. Bechtel provided managers to direct the staff of the mechanical contractor in the review of existing records of completed and partially completed work. The Supply System later adopted this effort as part of the reverification program.

During the second half of 1981, the Supply System incorporated the overall corrective actions program into their normal management structure. The Supply System mobilized for performing reverification of records reviews and reinspections of samples of hardware. An NRC resident inspector has been on site to monitor these activities. Particular attention was given to the work restart planning and the initial mobilization for the reverification program. The Supply System integrated the record reviews and hardware reinspections and repairs into the ongoing project completion effort. Data was not compiled regarding the amount of physical rework arising from the reviews and reinspections, but our inspectors noted that the deficiency control documents were incorporated into work controls for the ongoing project completion effort. Significant deficiencies appear to have been appropriately reported to the Commission in accordance with our existing Regulation 10-CFR-50.55E.

The work restart effort involved intensive reviews of specifications and work procedures by the Supply System and its contractors. One aspect of that review involved the elimination of requirements beyond those specified in codes and standards which were committed in the safety analysis report. This has permitted the Supply System acceptance of conditions which previously they had identified as discrepant. It also forms the basis for the Supply System's reinspection of previous work. In some cases the Supply System has implemented positions which do not meet the quality assurance requirements of codes and standards generally referenced in the safety analysis report. However, the Supply System has notified the NRC of these matters and the NRC acceptance has not yet been completed. It appears that some safety analysis report amendments may be called for and are in progress.

Currently Bechtel is acting in the dual role of the construction manager and systems completion contractor. Completion of the mechanical systems is being performed directly by Bechtel forces. Although the Bechtel program was originally perceived as a mature and tested management system, there have been some indications that the program implementation has some weaknesses. The Supply System appears to be trying to improve the Bechtel performance in this regard.

As of this date, the NRC has not completed inspections and records reviews in this plant. Some of this inspection effort was deferred pending completion of the reviews, reinspections and rework by the Supply System. Additionally, we have not completed our inspection program for electrical installations. Some inspections have been repeatedly deferred due to the continued lack of definition of the applicable cable separation criteria for the project.

In summary, the project has experienced significant quality assurance problems in the past. However, the Supply System has taken intensive corrective actions to assure that the plant will meet minimum standards. The NRC has not yet fully assessed the effectiveness of those actions. Some issues remain to be resolved and implemented, but there is no indication that the resolution and implementation cannot be achieved.

And I believe Mr. Dodds has some comments.

MR. PLESSET: I think we have a question. Mr. Ray.

MR. TOTH: Yes, sir?

MR. RAY: I agree with your statement that there seems to have been a significant lack of quality in the auditing on the part of WPSS in the past. It wasn't clear to me from your narration as to whether or not these deficiencies were reported by them or were they brought to the surface by your audits?

MR.TOTH: It seems to be a little of both. Many of the key deficiencies were identified by the Supply System. Many they did not identify. A lot of these came to light as the result of allegations of personnel on the site pointing us in the direction of problems which the Supply System's auditing program had not recognized. So it's a matter of both cases there.

MR. RAY: Um hm. I gathered from your narration that there was a combination of deficiency in QA on the part of the contractors and QA deficiency on the part of the Supply System. Is that conclusion correct?

MR. TOTH: Yes.

MR. RAY: It's both.

MR. TOTH: And --

MR. RAY: Well, what assurance do you have that in the plants, and I use the plural here, still to be completed that the Supply System has an adequate quality control system of QA, and so on?

MR. TOTH: Well, a lot of --

MR. RAY: Well, is there -- has there been a change in the QA organization on the part of the licensee, and will you tell us about that when you make your presentation?

MR. MATLOCK: Yes, I can.

MR. RAY: Well, maybe that's the time to get the answer. However, an opinion on your part would be appreciated.

MR. TOTH: There certainly have been positive changes in the quality assurance program at the site. I said the contractors' procedures had previously been reviewed by the architect engineer and the Supply System in a joint organization. Things had been missed. Those procedures had all been re-examined. They had been compared in detail by teams upon teams of personnel who were taking the commitments of the safety analysis report. They were taking the applicable codes and standards, and they were drawing upon prior reviews of previous deficiencies, all the various things they had documented and identified, and identified trends, and they drew upon this data base to evaluate their work procedures to effect changes to preclude reoccurrence of the problems which had been experienced.

MR. RAY: In the earlier stages of these events, I would like your opinion as to whether or not there was a deficiency in the staff commitment on the part of the licensee to QA.

MR. TOTH: By "staff commitment," what would --

MR. RAY: Well, magnitude, number of inspection personnel, and so on.

MR. TOTH: You mean NRC staff?

MR. RAY: No, QA on the part of the Supply System.

MR. TOTH: The Supply System's?

MR. RAY: Commitment of personnel to this function, was that inadequate?

MR. TOTH: Al?

MR. DODDS: Excuse me. That's a very difficult question to answer because of the type of organization and the changes that have occurred in the organization at this site. And --

MR. RAY: Well, you certainly would have an opinion as to --

MR. DODDS: Well, one of --

MR. RAY: -- the adequacy when these things were developing.

MR. DODDS: We did identify the quality assurance program and one -- some problems with the quality assurance programs along the way. It's been our feeling all along that the licensee has been responsive to our observations for the quality assurance program, but the job wasn't getting done. This did culminate in the issuance of the -- of a 50.54F letter request for information in which we said "Hey, go back and take a good hard look at everything that you have done in the past and come up with a program to provide assurance that you don't have another sacrificial shield wall lurking out in the piping system or electrical or instrumentation, or whatever." And so that was the purpose of that letter, to force them into not only a records review but a hands-on sampling program to assure themselves that they did get the quality that they thought they had out there, and so -- and some benefit has been, certainly been derived from that. I think the Supply System is planning to address this in a great deal of issue --

MR. RAY: Thank you. I like to hear that.

MR. DODDS: -- detail later.

MR. RAY: Thank you.

MR. EBERSOLE: Mr. Chairman?

MR. PLESSET: Yes, go ahead, Jesse.

MR. EBERSOLE: We earlier mentioned environmental qualification of electrical equipment. Some of this type-tested equipment requires a high degree of procedural control in the field to realize the typed model. Are you looking in particular to see in your QA program whether you are realizing the typed model, and do you have any in situ tests that validate that you have an environmentally qualified electrical component?

MR. TOTH: Part of our routine inspection program does involve the inspector selecting specific hardware items, including electrical hardware items, and reviewing the records associated with those and the physical installation. In terms of a commitment to an IEEE standard that a particular environmental test be done, this is something the inspector would look for in terms of confirming records.

MR. EBERSOLE: So there is no test. There is just an examination of records.

MR. TOTH: We don't --

MR. EBERSOLE: In other words --

MR. TOTH: We don't do a test.

MR. EBERSOLE: Yes.

MR. TOTH: We would look for the records which indicate that the vendor or the responsible designer had arranged for such tests.

MR. EBERSOLE: For instance, would you find out that there would be a record of torquing up the bolts on a watertight cover on a gear box or -- is that the sort of thing you are talking about?

MR. TOTH: We would look for those, but, for instance, if there is a specification requirement -- or let's start with the safety analysis report, a statement that there will be a compliance with a particular IEEE standard regarding environmental qualifications or seismic qualifications, and that IEEE standard would identify certain tests which need to be done for a type of equipment. Our inspector, in looking at the records for the item of equipment he selected, the program would call for him to verify that the records show that the tests called for by the IEEE in fact had been conducted and had at least been evaluated and deemed to be acceptable test results. He might not get into the details of the numbers and the calculations of the tests themselves, but I believe he would go at least as far as identifying that the test conclusion is that this meets the IEEE.

MR. EBERSOLE: Yes, but if I have an environmentally qualified piece of equipment as a type model and I go into the field with it, and I have to take it apart and put it together again without good QA about how I did that, I don't know whether I have got an environmentally qualified end product or not, and there is no test I know other than in situ exposure test, which I don't think you do, that'll confirm whether it's any good.

MR. TOTH: As far as taking it apart and putting it together, that element is a installation or maintenance activity, and the one thing that would be covered by the quality assurance program would be the requirement that the vendor manufacturer's manuals and recommendations for performing that activity be referred to and considered in the activity.

MR. EBERSOLE: How do you realize that that's been done?

MR. TOTH: Well, we have for in -- for operations and operations maintenance, I can't directly speak there. In terms of construction and the initial installation, if the device has to be taken apart and put together as part of installation or preventive maintenance, we look at the quality assurance program to see that there are requirements there that the designer refer to the manufacturer's manuals, or we look for the requirements that the constructor do this. That's one element when we look at the procedures review. The other is that during a routine inspection, let's again consider the electrical area, as the inspector observes an installation, and he should observe the quality control inspection, the crafts performing the installation and the in-process generation of records, at that time his acceptance criteria for determining whether what he is observing is acceptable, that criteria would have to come from his referral to the equipment manufacturer's recommendations, or alternatively to the installation specification.

MR. EBERSOLE: You say he has to observe the actual performance of the reassembly?

MR. TOTH: The way this goes is that the NRC inspections are a sampling, random type of an activity. The -- normally the inspectors come from a regional office and visit a site. They might appear at a site three or four days out of a month or a six to eight-week period. As they arrive at the site, if it's an electrical inspector, he would tour the plant and look for work activities in process, and should he encounter this type of an activity, then he would include that in his sample.

MR. EBERSOLE: Um hmm.

MR. TOTH: It is certainly quite possible that over the entire course of the plant construction he may never encounter that type of a operation in progress.

MR. EBERSOLE: In short, I could go out and find some loose gaskets, I guess.

MR. TOTH: Now, of course, we do a records review also. When you get into the records, you would be looking for an installation record which has a quality control inspection which verifies the installation in accordance with procedures. From that record, that would take you to the procedures which governed that installation. Those procedures then would be compared to the specification requirements and the vendor's recommendations for the installation. If the records omit some major item, the inspector would certainly question why that vendor recommendation, particularly a precaution, --

MR. EBERSOLE: Yes.

MR. TOTH: -- was not included.

MR. EBERSOLE: Uh huh. Thank you.

MR. TOTH: Bob?

MR. DODDO: I'll give a real brief summary of the construction management for the facility to date. Supply System has gone through several gyrations in arriving at the current construction management organization. Initially Burns & Roe acted as both the architect engineer and the construction manager with the Supply System serving an overview function, including approval of contracts. Management studies indicated that the Supply System's needs might better be served by using an integrative organization wherein the Supply System and the architect engineer worked as one in their quality assurance and construction management organizations. This combined organization was implemented in 1978. The Supply System put this same type of organization in effect at all of its construction sites.

In 1980 when Mr. Ferguson was hired as the managing director for the Supply System, it was very evident to him that this concept was not working at any of the sites. Construction schedules were not being met, nor were they well-defined. It was not readily apparent who had the prime responsibility to get the job done. Therefore, the organizations were de-integrated at all three sites. This occurred around November of 1980.

At WNP-2, Burns & Roe was retained as the architect engineer. Bechtel Power Corporation was hired as the construction manager and the systems completion contractor. As systems completion contractor, what happens, when one contractor finishes his system to where basically that he has finished his contract obligations, he turns it over to Bechtel. They then walk the system down, check it out basically, and follow through on any additional construction items that may need to happen as far as that system is concerned.

The Supply System has now returned to the role of oversite project management. Experienced management was brought in to support this organization. We find that this last change has resulted in a substantial improvement in the licensee's project management team, management controls, and in the attitude of the project personnel towards quality. And that's basically where we stand as far as the current construction organization is concerned.

MR. PLESSET: Well, thank you.

MR. DODDS: Dennis Willett will address the operation organization and the pre-operational testing, their readiness for pre-operational testing.

MR. WILLETT: Hellc, my name is Dennis Willett and I am one of these traveling inspectors that goes out and looks at the plants to make sure everybody is doing what they are supposed to be doing. I have been asked to give a brief description today of the operations inspection program from the Region and this is going to be a brief overview of what we do.

The NRC's operational inspection program consists of a repetitive, a programmatic approach to monitoring select activities and their results, with a periodic overall appraisal consisting of the total inspection program. This consists of construction, security, health physics, enforcement history, LER analysis, allegations. These are all combined into a systematic licensing appraisal program review. The key elements of the operations inspectors are to look at maintenance, surveillance, audit activities, and, of course, operations.

The analysis of plant operations from the systematic licensing appraisal for the previous appraisal period, the regional I&E management considers that the plant procedures and preparation guidelines and the general employee training program for WNP-2 to be adequate. However, implementation of these requirements should not be inspected due to lack of activity.

If there's any questions, please feel free to interrupt me.

The maintenance activities to date I observed to be adequate and they have established an adequate and effective organization.

Surveillance and pre-operational testing has been limited to the review of test and start-up organization, pre-operational test procedures, component and system flushing programs, with very little physical work to date. We expect that the activities after cold hydro to pick up significantly.

The audit and review activities for quality assurance have been conducted as required and the on-site quality assurance organization has been and is performing surveillance and plant operation and pre-operational testing activities. The test working group has been performing in accordance with its charter and the testing startup program manual.

In addition to the overall appraisal and the routine inspections, the Region is involved in additional licensing reviews. Early in 1982, NRC regional staff and my management came to Richland for a presentation by the Supply System for a management presentation on the organization of WPPSS. Along with this presentation, the NRR and Region V staff interviewed key managers, directors, supervisor and key personnel within the different organization's components of the Supply System. This presentation included a detailed description of the scope and responsibilities for each principal unit and their task and management interfaces. During the several days of these presentations, our office interviewed people at the site and in the corporate offices. The organizations and personnel examined on the site included startup people, maintenance personnel, their management, the training organization, plant staff, reactor operators, operations supervisor, reactor operators, if I didn't mention it already. And in the opinion of the regional staff, the operating organization and personnel meet and exceed the regulatory requirements which ensure that the facility can be operated by the applicant without unduly endangering the health and safety of the public.

MR. EBERSOLE: May I ask a question?

MR. WILLETT: Yes, sir.

MR. EBERSOLE: If I were to go into the plant and say that I was looking for records of procedures --

MR. WILLETT: Records of procedures.

MR. EBERSOLE: Yes, interpreting procedures as being critical to the quality of the product. And I would look in two areas, one would be the environmental qualification of electrical records. And -- what percent of these procedural controls do you look at, for instance, on the electrical elements inside a containment that perform critical safety functions? Do you look at one percent, ten percent, five percent, and do you require the presence of procedural controls, which you believe? That --

MR. WILLETT: Well, I think the answer to your question, do we look at them, is -- one of the answers to your question, yes, we do look at them. To --

MR. EBERSOLE: What percent?

MR. WILLETT: -- a percentage of the sample size, I can't tell you off the top of my head.

MR. EBERSOLE: Can you give me a crude estimate?

MR. WILLETT: Well, let me give you an example of how the program works. We have specific inspection procedures, okay. They are divided up, for example, let's discuss maintenance and working on a quality-related pump valve or a solenoid valve or an environmentally qualified piece of equipment. So I take out an inspection module that gives me the high -- the key points that I should look for to assure myself that the maintenance department can work on an environmentally-qualified, Class 1E piece of equipment. And --

MR. EBERSOLE: Is that just -- that's an examination of paper, that's all, isn't it? You are just looking at the paper record?

MR. WILLETT: Well, I look at the paper record, but I also monitor the work if it's being performed.

MR. EBERSOLE: No, the work, as I am invoking it here, has been done.

MR. WILLETT: Okay.

MR. EBERSOLE: So there you look at the paper record . . .

MR. WILLETT: Yes, I do.

MR. EBERSOLE: . . . and you look for fabrication of procedural controls.

MR. WILLETT: Yes.

MR. EBERSOLE: And if you don't find them, what do you do then? Do you look further?

MR. WILLETT: Yes.

MR. EBERSOLE: And what percent do you look at, did you say, maybe ten percent? I don't want to --

MR. WILLETT: Well, I couldn't give you that number. I --

MR. EBERSOLE: Well, it's not a -- it's far from a hundred.

MR. DODDS: Could I --

MR. EBERSOLE: Uh, yes.

MR. DODDS: Could I respond to that?

MR. EBERSOLE: Yes.

MR. DODDS: Generally we look at a -- in the construction field in looking at it, we might look at a sample of 10 to 20 pieces of equipment --

MR. EBERSOLE: Out of a --

MR. DODS: -- for the environmental qualification.

We would not look at all of them, but we would do a random sample of that, that number, that magnitude of pieces of equipment.

MR. EBERSOLE: Out of how many?

MR. DODDS: Well, there are -- there are hundreds. But --

MR. EBERSOLE: So it's somewhere between one and ten percent maybe?

MR. DODDS: That's -- that's right.

MR. EBERSOLE: And this is for type-tested equipment requiring field assembly? These are type-proven equipment but they do require field assembly?

MR. DODDS: A lot of that equipment is not, not taken apart in the field and put back together.

MR. EBERSOLE: There are degrees of disassembly.

MR. DODDS: There are degrees of it certainly, yes.

MR. EBERSOLE: All right. Okay, that's a fair picture. Okay, now let's go to one other area. Suppose I find a weld or X welds, and I have no procedural records of how that was put together, what do you do about those cases?

MR. DODDS: If I find where there is a weld that there is no procedural records of how that was put together, --

MR. EBERSOLE: Yes.

MR. DODDS: -- that weld comes out.

MR. EBERSOLE: In short, you consider the procedural controls an integral part of the weld quality.

MR. DODDS: Yes, they . . .

MR. EBERSOLE: You can't inspect it and validate it sufficiently, is this what you are saying?

MR. DODDS: You have got to be able to validate the quality of that weld. Now, again, you have got to look at the piece of equipment and the applicable codes that apply to that weld.

MR. EBERSOLE: I know.

MR. DODDS: And in some instances there are no codes that apply to it, and so then all you can do is inspect it for commercial grade quality, because that's, you know, that's the way it's fabricated.

MR. EBERSOLE: But if it's a critical safety weld, you require the presence of the procedural controls with which it was put together?

MR. DODDS: That's generally the case, yes.

MR. EBERSOLE: Are there exceptions?

MR. DODDS: I don't know of any, but, you know, I'm not going to -- I am not going to say here and say there isn't . . .

MR. EBERSOLE: Yes, okay.

MR. DODDS: . . . because I haven't looked into it in that detail, and I do know that there are some, some welds, but generally --

MR. EBERSOLE: I guess my point is that it's to find out whether or not by a simple non-destructive inspection and test whether you can qualify a weld in a critical system, and I guess the answer is no.

MR. DODDS: I guess that's right, yes.

MR. EBERSOLE: All right, thank you.

MR. DODDS: Now, there was some -- could I just amplify one little -- that it's possible to go ahead and do some on-site testing to qualify off-the-shelf components. The applicant can do that, or he may do that. He may do that for valves or something else like that to get them environmentally qualified.

MR. EBERSOLE: You can qualify off-the-shelf components without procedural controls on how they were fabricated?

MR. DODDS: Oh, no. No, you have got to exercise a procedure and a control system entirely. But what I am saying is that they can do on-site qualification of equipment.

MR. EBERSOLE: Yes. Well, thank you.

MR. PLESSET: Does that complete --

MR. WILLETT: Yes, sir.

MR. PLESSET: -- the presentation?

MR. WILLETT: I'll turn it over to Mr. Dodds again.

MR. DODDS: I'm through.

MR. PLESSET: Well, fine. We'll declare --

MR. AULUCK: That concludes the NRC presentation.

MR. PLESSET: All right, very good. I will declare a ten-minute recess.

(Whereupon, a short recess was taken.)

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AFTERNOON SESSION

3:10 p.m.

MR. PLESSET: We will now go to a presentation by the applicant and, as I understand it, Mr. Bibb will begin. Mr. Bibb.

MR. BIBB: Good afternoon. My name is Bill Bibb. And as Director of the Supply Systems Power Generation Unit I'm pleased to welcome you all here, NCRS panel, NRC and members of the public.

We are all here to assure the same objective, that WP II is built and operated safely and meets all the state and federal requirements. As a person who spent 28 years in the commercial nuclear field, I understand how important it is to keep the commercial nuclear power industry's safety record intact.

I am here today as the person responsible to the chief operating officer and the managing director for safe and efficient operation of our plants. I know what that job entails. Since I've been with the supply system, I've helped to develop the start-up program. I've been involved in project management on I and IV and just prior to this job I was the project manager on unit II.

On the operations side, I've been involved in start-up and operations of a number of boiling water reactors both foreign and domestic. I hold a reactor operator's license and senior reactor operator's license in three other plants.

Based on that experience, in view of what we've done here, I believe that WNP-2 will be ready for full power operating license on or before the scheduled fuel-up date of September 1983. Our presentations today and tomorrow are designed to demonstrate how we intend to accomplish that goal.

To give you a little bit of an overview on the supply system. The creation of the Washington Public Power Supply System, we call it for short Supply System, in 1957 marked the innovative departure in the nation's history of electric energy generation.

When the energy demands of the Northwest became too great for any single utility to resolve, the consumer-owned utilities in Washington banded together to form the Supply System. By joining forces, they were able to share in the financing, constructing and operating of electric generating plants. Today the Supply System is a municipal corporation of the State of Washington, which has 19 public utility districts and 4 municipal power systems as its members.

Each of these utilities has elected a representative to our board of directors. This board has the final authority to purchase, acquire, construct, terminate and decommission power plants, works and facilities.

Until recently, most of the policy decisions affecting

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the operation of our plants were vested in the full board. That's no longer the case except in those instances I've just mentioned. Now, the senior policy group is the executive board made up of five members elected from the full board and six outside members who were chosen for their business expertise.

I'm pleased to tell you that among those there are two chief executive officers from other utilities who have operating nuclear plants and, in addition, a man who is a veteran manager of some of the largest energy-related construction projects in the Northwest.

Our managing director, Bob Ferguson, is accountable to this board for insuring the safe and efficient operation of our plants. He has personally assured the executive board members that his safety standards for WNP-2 are more stringent than any of those imposed upon us.

In fact, he has demanded a complete independent technical audit of WNP-2 plant completion plan to make sure that it is being implemented effectively.

Dr. John Honekamp, who is here today, will be speaking to you a little bit later and giving you some detail on that independent review.

We must be responsive not only to the power needs of the Northwest but to the welfare of our community. The managing director, the chief operating officer and I each have the

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authority to terminate the operation or stop work for safety reasons; to declare an emergency and take the necessary steps to mitigate and recover from an accident; and to implement other management decisions that are to protect the health and safety of the public and our employees.

Now, I want to discuss the Supply System organization. The managing director has recently announced a realignment of our company. That was mentioned a little earlier today. It is designed as another step in the transition of becoming a power generation utility. In this latest move, he has named Mr. Don Mazur as our chief operating officer with the title of Director of Operations.

Mr. Mazur reports directly to the managing director. He has reporting to him the Program Directors for all the projects for power generation and for engineering, the organizations that must work together to get the job done.

Mr. Mazur has 19 years of general and nuclear related construction experience. Prior to joining the Supply System in November of 1980, he served as project manager with the field project office of the Department of Energy Strategic Petroleum Reserve Program in Louisiana. Prior to assuming this post, he served as managing director at the Fast Flux Test Facility where he assisted in its overall construction, engineering and start-up.

Mr. Mazur holds a bachelor of science degree in

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mechanical engineering from the Lawrence Institute of Technology in Michigan. Don will speak to us for a few minutes and give us some corporate overview in his new role and, following that, I will return to give you some specifics on functions of the company.

MR. MAZUR: My name is Don Mazur. I'm the Director of Operations for the Supply System, recently reorganized. I want to cover just two basic points before turning you back to Mr. Bibb.

One related to the role that Mr. Ferguson has in reporting to the executive board of the Supply System, that 11 member board that Mr. Bibb referred to. And in the delegation of that board has given Mr. Ferguson regarding all matters related to nuclear safety, that is a standing delegation that Mr. Ferguson has. No questions regarding that. That in turn represents the discharge of Mr. Bibb's and my responsibility in carrying that delegation out. That is in order.

Regarding the organization and the reasons. As was indicated, we're heavily oriented into a construction program for the last number of years, starting with roughly five nuclear power plants as late as one year ago and presently into a two reactor construction program and one in an extended delay program.

In the operation that took place in the fall of 1980 when Mr. Ferguson came on board and in the deintegration of the Supply System and a more focused responsobility aimed at getting the plants designed and built to the quality standards, that organizational structure of Mr. Ferguson has basically been in place for that period of time, roughly a little over a year and a half.

As we move that through construction period and in the preparation for achieving operational status, as we are on the verge of now, it was necessary for us to look at our organization and see if it represented the cleanest lines of responsibility, the necessary interfaces to assure no mismanagement as we went into operation, and that we were the strongest capable.

Secondly, we were somewhat unique in that we are an all nuclear utility. And it was reasonable to take a look at us from the standpoint of a clean organization. Mr. Ferguson chartered the input organization and specifically Mr. Wilkinson and Zack Bate to come out to the Supply System and review our organization, interview the personnel, see how the system worked and suggest if appropriate changes to that organization.

Further, he met with CEO's of other utilities to see how they were managed. And in the collection of that intelligence, it led to the decision to make the changes as you see on the board representing the role of the CEO.

In addition, we cleaned up one other area that was put in place back in the late 80's, and that was all quality assurance functions were removed from the program directors and brought into a central QA function administered from the home office.

Those are the major changes that we have put in place. And we have presently implemented those, and they are functioning to right now. I offer that the organization represents a strong commitment to nuclear safety, a strong commitment to excellence, not because of other standards but because this management is going to do it right and administer it right.

I think some of the comments made by the NRC representatives have indicated changes in the attitude and changes in the plus direction toward that commitment. We are committed to continue those.

With that, I will return you back to Mr. Bibb who will answer any questions you may have.

MR, MARK: Well, just before you should do so, and I'm not disapproving. In fact, I'm admiring the statements you have made. Your statement that you've done some changes in the late 80's gives me a peculiar feeling.

MR. MAZUR: I think I was referring to the calendar year '80, not the decade.

MR. MARK: You mean late 1978?

MR. SCHWENCER: Late in 1980.

MR. MAZUR: Late in the year 1980.

MR. RAY: Mr. Mazur, as Director of Operations, you indicate an emphasis on safety of operation. You also have responsibility for economy of operation. Would I be putting words in your mouth if I said that the safety issue precedes economy?

MR. MAZUR: The second part, you said I have responsibility for economy of safety; is that what you said?

MR. RAY: Economy of operation, financial responsibility.

MR. MAZUR: I have financial responsibility for building and operating the plants, yes.

MR. RAY: Okay. Well now, would I be putting words in your mouth if I said that what you have said leads me to believe correctly that your emphasis, your prime priority, is going to be on safety of operations rather than economy of operations?

MR. MAZUR: My prime emphasis will be on safety of operation.

MR. RAY: Okay, I'm interested in the organization. I see here in the chart mention of every function except distribution and transmission and that one of the earlier charts indicated the organization is not responsible for the distribution.

What about transmission?

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MR. MAZUR: That is a function of BPA. We go to a load center which BPA then has transmission responsibility for distributing the energy.

MR. RAY: Then you are dependent on BPA for operation of the integrating transmission between the various WPPSS plants.

MR. MAZUR: We put it into the grid system and they are the ones that do the distribution, energy distribution, yes.

MR. RAY: Well, in this respect, there is a divided responsibility that would concern me from the viewpoint of reliability of operation of your plants. Let's assume that the extremely improbable event of a system black-out occurs. Who controls the restoration of the transmission system to bring the systems back into linkage?

MR. BIBB: Could I ask that -- Mr. Powers will be addressing the electrical distribution system a little later in the program and is prepared to discuss that.

MR. RAY: I'm not talking about distribution. I'm talking about bulk power transmission, the interties between your plants.

MR. BIBB: I think we can cover that, if I could, a little later. But it is a -- it fits into a scenario that needs to be described in its full content, in that we do have dams here that supply power, each of them supply as --

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essentially as an island. And that will be covered pretty clearly a little later on.

MR. RAY: Thank you. I'll wait.

MR. BIBB: I appreciate the question.

MR. EBERSOLE: May I ask a question, please? Mr. Mazur, I'd like to have you explain, express what you think is the basis for your feeling that you have a safe plant and a safe operation. You could tell me if NRC says it's safe, it's safe; if GE says it's safe, it's safe; if Gibson Hill or Bechtel says it's safe, it's safe; or you might tell me within my corporate structure I've got some people who tell me it's safe, and I believe them.

What do you do to stand on your grounds that you say a given plant is safely designed and safely operated? What's your source, basis for that?

MR. MAZUR: The first source is the strength and the skills of the organization to which I manage, and the reliance I place on their professional skill, training and background. That's first.

MR. EBERSOLE: Is that the corporate?

MR. MAZUR: Corporate as well as at the site.

Secondly, as an individual I meet every month at every one of the plants and review the status of design, construction, quality, safety operations of all that, and I personally review that at every plant.

I personally conduct special reviews on specifics of the plant in terms of design verification, in terms of procedural control, in terms of trend analysis. I meet daily with the managing director on any and all issues that might be pertinent to the system.

So both in a structural sense and reliance upon the professionals we have working for us, and in the personal contact with the plant day in and day out.

MR. BIBB: Then I will continue with the next slide. I'm going to quickly run through some slides to sort of give an overview of the organization and responsibilities.

(Slide.)

Obviously, the managing director is over all responsibility for establishing policy for the entire company. Mr. Mazur is the chief operating officer with responsibility for those functions that we've mentioned before, construction, operation and engineering.

And we have a Director of Support Services, as you can see, who is an organization that is a service organization for the plants. And I will get into that a little bit in detail in the next two or three slides.

MR. CATTON: Before you take this slide off, the one on the left, are you trying to indicate where your various safety review committees come into play? Normally each plant has one and usually there is some kind of a review committee that ties plant to the top level of management.

MR. BIBB: There is a nuclear safety review board at the corporate level, and I do have a slide on that a little later. But there are other committees as well that we'll be talking about.

The Director of Licensing and Assurance has responsibility at the corporate level for quality assurance and for the licensing interface with the NRC and others.

(Slide.)

The Director of Power Generation, myself, overall responsibility for the safe operation of the plants. In that position, I've been relieved of all other responsibilities so that I can put full attention on the safe operation of the plants. And that, of course, includes the training of personnel, acquisition of personnel, and the overall staffing and operation of the plants.

The Program Director, Dr. Matlock, will be speaking to you a little later, has the responsibility for the successful completion of WNP-2.

MR. MARK: Could you help me? You have a responsibility for the acquisition of personnel.

MR. BIBB: In operations, that's right.

MR. MARK: Right. Now, speaking of WNP-2, the personnel that will be -- will be a thousand people, or something like that, maybe you can correct me. How many of those

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personnel will you, in fact, sign a slip saying yes, the hiring action is okay? For 10 of those, or 100 of those, certainly not for 1,000 of those.

MR. BIBB: First off, the operating staff is more like 250 to 280. Those are the people that I'm directly responsible for. I sign the papers on those who report directly to me, which would be the plant manager and I review those that the plant manager himself hires. Below that, we go with the department managers. And the acquisition of people now includes an in depth review of their background, certain testing of individuals, not written tests now; I'm talking about psychological testing and all those kinds of things.

So there's a number of requirements that a person must meet before they can be put on the staff. Again, that depends on the type of job that you're looking at.

MR. MARK: You yourself will however be signing the papers on the order of 10 of those 250, or something of that sort?

MR. BIBB: That's correct.

MR. MARK: And the others will be passed to you as approved by half a dozen other people at the -- what I might refer to, because I'm in the atomic energy business, as clearance of the rest will be vouched for by those half a dozen.

MR. BIBB: Yes, I think that's right, I do, and follow

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up on that though, as I'm sure you are aware the training program, even after a person is put on staff, is extensive. For an operator, for example, we're looking at about three years. And Mr. Martin, our plant manager, will be giving you the details of that program a little later.

MR. MARK: I'll be happy to wait until later and I don't really want to make much of this question, but I'm wondering nevertheless, you might have 1,000 applicants for 100 jobs, or whatever the ratio happens to be. And you reject some fraction, some small fraction, probably. I'm wondering what that is and why?

MR. BIBB: What the reject ratio is?

MR. MARK: That is partly it and partly why do you reject people? What are the bases that you come to? I can understand that a guy can't read and can't write and doesn't know up from down, you reject him. Maybe he looked like an uneasy employee, you might reject him. I'm just a little curious as to what your experience in real life may be along lines like that.

MR. BIBB: I can't give you the exact ration but I think that's probably about one out of 25 or something like that, is that about right? Something in that neighborhood. It's ---

MR. MARTIN: I'll be addressing that.

MR. BIBB: Yes, Jerry Martin, the plant manager, will

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be addressing that a little later.

MR. MARK: That will be very fine, thank you.

MR. BIBB: It's a screened function and the things we look for, of course, is basic learning skills and a history of their experiences. So if I can carry them a little further, he's got a specific item to address on that one.

MR. MARK: I would welcome a comment on it from the background of real experience.

MR. BIBB: We will cover that, yes.

MR. PLESSET: I think that Dr. Mark had another point. At least, it seemed to me that he did. Not only competence, but the general character is important for you people.

MR. MARK: I certainly meant to include that.

MR. PLESSET: Yes. And how do you go about getting this element in employees, because everyone who has got access to your plant is important, as important as anybody else, even the manager, in the sense of safety and reliability and so on. We've heard of many cases where there have been disturbances of a plant operation by insiders, very undesirable thing. It's something to be avoided.

MR. BIBB: We understand ---

MR. PLESSET: Do I make my amendment to Dr. Mark's point?

MR. BIBB: We understand the question very well. It's something that we deal with all the time and I would like to leave that category because he is specifically going to address that subject.

MR. PLESSET: Fine, thank you.

MR. BIBB: I covered the Program Director.

Now, the Director of Technology, of course, provides engineering services for the plants. And I'm going to get on to that a little bit later.

Now, I'd like to expose to you the experience of some of the key management people in our company.

(Slide.)

You will notice Mr. Ferguson, our managing director, has 20 years of experience in the nuclear industry. I know, for example, that Mr. Ferguson worked for some time as a reactor engineer himself, so he has got a personal exposure to what it means to operate a plant.

You will notice Mr. Martin, our plant manager, for example, has 22 years of experience. I've known Jerry for a number of years, a good deal of that is on boiling water reactors. So he is well-qualified.

Notice our Training Manager, 16 years of experience in the nuclear field.

And then our Director of Licensing and Assurance, 24 years of experience in that field. So we feel that we have a strong staff, both at the corporate level and, as you will see a little later, at the plant level.

(Slide.)

Now, I'd like to get a little bit into the power generation organization; starting from the left on the slide, we have -- we do have two operating plants, Hanford Generating Project and the Packwood plant. The Hanford Generating Plant uses waste steam from the N reactor, produces 870 megawatts electric gross. The Packwood Plant is a small hydroelectric unit up in the mountains and is a 30 megawatt plant.

The next organization that I will cover is a generation services we call it. It's a central organization in my group that is for the purpose of supporting the operating plant. They provide services such as non-destructive testing, standards, laboratory or calibration of instrumentation, and labor services and other similar activities.

Our philosophy is that we would like the plant manager to be responsible for those things that he needs on a routine basis to operate the plant, day to day basis. Most other kinds of things that he doesn't have to worry about along that line we would have in a service function. This is one of those functions.

Another group that we have centrally is generation training. We have a manager, Mr. Stickney, that provides -- and his organization -- that provides policy and guidance specifically for all the plants to keep our training program on track and following say a road map.

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In addition to that, he provides instructors that do generic types of training.

The next organization, sticking down a little bit there, is the test and start-up group on WNP-2. It's pretty clear what they do right now, since we just completed the hydrostatic tests, getting into flushing of systems. A large percentage of the plant is now in some phase of an operating condition. Mr. Afflerbach has a group of approximately 70 people, engineers, that provide the testing of that plant. That will go through the prerequisite testing, the pre-operational testing and some of those folks will stay on to assist with the power test program, under Mr. Martin.

The next organization is WNP-1. The plant manager is ---

MR. MARK: Excuse me. You say some of them will stay on to assist. Does that mean they are not really devoted employees of your operation?

MR. BIBB: All of those ---

MR. MARK: Are they on loan or what?

MR. BIBB: Oh, no. All of ---

MR. MARK: Why won't they stay on forever?

MR. BIBB: Let me clarify. All of those 70 people are Supply System employees. Our intention that some number of those will stay in the WNP-2 plant to assist with the power test program. The rest of them we fully intend to keep and hope we don't lose a single one of them because there's a place for them in the Supply System in some other function, engineering or whatever. They will be a valuable resource, and our intention is to keep every one of them.

MR. MARK: Thank you.

MR. BIBB: Yes, they are valuable people because they have learned the plant, they know a lot about it.

MR. MARK: Well, is it possible in some situations that I am sure you are aware of, we've heard of people coming to help who really had their hearts somewhere else. These don't necessarily, as I understand what you said.

MR. BIBB: Okay. Number one, as you may know, is a pressurized water reactor, 1,250 megawatt plant.

I'll skip over to number three, that's also a pressurized water reactor and Mr. Wilson is the manager, the plant manager. It's a 1,240 megawatt combustion engineering plant.

Now, I'll jump back to number two which you toured this morning. Jerry Martin is the plant manager and that, of course, is a 1,100 -- approximately 1,100 megawatt plant. And you will be hearing more of the details of that plant as we get on through the presentations.

MR. RAY: Before you remove that slide, please. You didn't say this, or at least I didn't hear it unless I wasn't listening hard enough, but your chart indicates, going back to the basic chart, a WNP-3, a 2 and a 1 program director.

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And then a subsequent chart delineated the responsibilities of the WNP-2 program director. And that delineation indicates that he will be responsible through construction. And I presume that would include start-up testing. And then this chart indicates that there is a WNP-1, 2 and 3 operations manager. This implies to me that the program directors are phased out. Is that correct?

MR. BIBB: The construction -- as the construction phases out, the program director phases out. That's correct. Our intention is that the baton would change at about fuel load, okay. So there is a long transition that goes from construction to an operating condition. And that has to be a gradual thing. For example, up until just a few months ago, we had start-up working with Dr. Matlock as the program director because the emphasis was on construction.

As we get along to the hydrostatic tests, the emphasis starts changing. It's more toward the testing phase of the plant. As that happened, when we transferred start-up over to my organization because it then becomes a hand in glove operation with the operators on the plant staff. And so that type of transition moves right on through until it's fully an operational unit, and the total responsibility then rests with the plant manager.

MR. RAY: I can understand that, but then what happens to this program director? That's a resource for the Supply

System that would seem to me to be very valuable.

MR. BIBB: We'll find a place for him, that's certain.

MR. RAY: You are maybe going to make him president of the organization.

MR. MATLOCK; Thank you for your observation.

MR. BIBB: I'm sorry. I didn't mean to make light of that. Was that your question?

MR. RAY: Yeah.

MR. BIBB: Okay.

(Slide.)

MR. BIBB: Okay. I'm going to try and cover some of the detail of the support functions now of each of these organizations that we've looked at as they support the operating power plant. This is on the assumption that we've moved into that phase where we are into operations.

I talked about the support services directorate under Mr. Shannon. It provides radiological and chemical support services. Now, that means that he helps to provide the overview on the plant chemistry and radiological program. He does not do the implementation. We have a plant staff that does that. So he is the group that sort of fits in between our engineering folks and the plant operating folks to assure that we have a check abd balance, if you will, of those programs.

In addition, he provides the security for the plant.

He also has the folks working with him that do the planning, preparation of the emergency preparedness.

MR. MARK: Where does he exist, in Seattle?

MR. BIBB: No, sir, right here in Richland.

MR. MARK: And he has on his mind, along with health physics, security.

MR. BIBB: That's correct. Industrial safety and certain administrative and records management type of thing. Now, all of these -- well, security is a full responsibility of his. This is, he has 100 or so security people that actually provide that service on the plant. They report through an organization to him.

MR. MARK: Does he have to give thought to whether the, heaven knows, barbed wire fences, TV monitors and any other such things you might like to mention, whether they are operated properly or designed properly or functioning properly and so on? I admit that in a plant like this the business of diversion of material is foolish line of thought, but nevertheless the inhibiting of sabotage is a very real requirement, perhaps less real here than many places, but still real.

Are those all on his mind as he comes in to work in the morning?

MR. BIBB: I'm not certain that I understand that question. It was a very long question. But I think that I

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can maybe clarify that a little bit in that he has been -- he or his people have been involved in the review of the plant security system, the electronic security system or surveillance system from its inception. They've been involved in that review process, so they understand that system and they have input to it.

They also have an extensive training program for those people, security people themselves, in the understanding of those types of things that you're covering here. So I believe that answers your question; is that correct?

MR. MARK: Yes, it does.

MR. BIBB: And he is concerned in all those areas as fulfilled to this point, those things that need to be ---

MR. MARK: They are, of course, rather un -- not closely connected with health physics, which I think he is also supposed to think of, whether employees do or don't get too much radiation.

MR. BIBB: Well, the folks that are involved in the implementation of that program are at the site and report directly to the plant manager. What Mr. Shannon does in this role and his people is that they provide an overview on us, let's say, on our plant staffs to assure that that program is moving as it should, that people are trained, that the procedures are okay, and that we are properly implementing those procedures. It's essentially an assurance of quality

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on that implementation.

MR. EBERSOLE: May I ask a question? This man's work, I take it, is to keep people out of places they shouldn't be. This is a security effort.

MR. BIBB: Security effort, that's correct.

MR. EBERSOLE: Does he also have the more terrible burden of assessing who he should let in and who he should not let in?

MR. BIBB: No, sir. The guard ---

MR. EBERSOLE: Who does that?

MR. BIBB: There are a set of fixed rules that would allow a person in to a certain area.

MR. EBERSOLE: And you have a ritual or a procedure or a policy or whatever it is that ---

MR. BIBB: Maybe I can answer that by an example. The rooms in the parts of the reactor building are accessed by a card and a code through the computerized system, security system. The decision on who gets that entry has been made some time before, and that is based on the psychological profiles and knowledge of that person and his capabilities prior to that time.

MR. EBERSOLE: You have test definition and duration times for him to do what he does when he goes in?

MR. BIBB: His time in there is known and monitored, that's correct.

That pretty well covers the support services directorate.

I am now getting into Mr. Glasscock's organization of licensing and assurance. Mr. Glasscock, being a director of the company, reporting to the managing director, has reporting to him the managers of quality assurance at each site. He has the -- for each plant, let me put it this way, for each plant there is an operational quality assurance manager and a construction quality assurance manager. Both of those report directly to Mr. Glasscock?

MR. MARK: Now, is Mr. Glasscock in charge of the operations from the early 70's until the late 70's?

MR. BIBB: No, sir, he is not.

MR. EBERSOLE: That function you just described -- there was two, you said operational QA and construction QA. What QA function takes care of the adequacy of the design drawings and the specs?

MR. BIBB: That's construction, construction quality assurance.

MR. EBERSOLE: I'm talking about not just confirming that construction matches specifications and requirements, but who investigates the adequacy of the original specifications? Construction? It wouldn't be construction; their function is to build. Is it design? Do you have a design assurance effort?

MR. BIBB: Yes, we do. And I don't like to keep deferring questions, but I do want to keep them in proper perspective. Dr. Honekamp will be speaking to you just a little later and he will discuss the entire of the design verification and the -- as I mentioned a little earlier on the plant itself. And I think that would fit a little better in that perspective.

MR. MARK: Probably in that same phase, the fact that you have had here some quality assurance problems and have made some dramatic changes on that account and you must now be in a position -- and I don't question the fact that you probably are -- to assure that whatever those problems were, have been caught up with. That will come up later?

MR. BIBB: I think that fits very well into Dr. Matlock's presentation.

MR. MARK: Very good.

MR. BIBB: And that is a very intensive and very long drawn-out program.

MR. MARK: I don't want an intensive and long drawn-out discussion of it.

MR. BIBB: I can assure you he gets to the point.

Okay, back on the quality assurance side, Mr. Glasscock is responsible for developing corporate policy and guidance for those QA programs I mentioned. He also has reporting to him the manager of licensing and the people who interface, as

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I said a while ago, with the outside.

(Slide.)

Within the power generation organization I mentioned earlier is a central service function, and these are -- and the training. And here are lists of some of the things that are provided by our organization to the operating plants.

(Slide.)

In the technology directorate, there are a number of technical types of services that are to provided to the operating plant. Again, getting back to the water chemistry thing, here, for example, is where the specification would be developed and assistance in materials, those kinds of things. Fuels management comes under the technology directorate, including planning, procuring, licensing, reload cores and all of those kind of things come under that directorate.

Environmental monitoring. Reactor safety. Core analysis. Engineered modifications including configuration control. Maybe just take a second to cover how we would view a modification and how our procedures are currently established to do that. Real quickly, the plant manager and the plant operating review committee would recognize the need for a change wherever it might come from. That would be reviewed and determined whether or not it would passed on to engineering and engineering, at that point, would pick up the traveler that moves along with that package and perform the modification in accordance with the base line, designed base line, or approve the change to the base line if that were necessary.

After the engineering work is complete, that would be passed back to the plant and the plant would review it again through the plant operating review committee and provide the implementation of that modification at an appropriate scheduled time.

MR. CATTON: Does this particular directorate support all the other plants?

MR. BIBB: Yes, it does. So there are a group of people that would be assigned for each plant as a routine.

MR. CATTON: Within this group, what kind of capability do you have? For example, would -- within this group would you do the Chapter 15 type calculations that are in the ASFR?

MR. BIBB: Is Dr. Shen in the audience?

MR. NELSON: Yes, he is here.

MR. BIBB: Would you care to address that? Did you hear the question?

MR. SHEN: I may have.

MR. BIBB: Ivan, would you restate the question.

MR. CATTON: I am interested in trying to get a measure of what kind of technical capability this particular group has. So I asked whether or not you have complete capability

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of doing, for example, Chapter 15 type calculations or reload type calculations, LOCA calculations.

MR. SHEN: On the relay and licensing questions, I think we will rely on the vendor to provide the basic calculation. With Chapter 15, for example, the safety envelope and the core design. But we do have capability and we have engineers who have many years of experience and core modeling experience to be able to either from an overview point of view or from a checking point of view.

MR. CATTON: I believe I've asked the question of some utilities that are far smaller than your own and they have found that it's beneficial to them to be able to do these kind of calculations because it makes them more aware of how a plant works. I'm very surprised that you don't.

MR. SHEN: The question I'm answering is the degree of -- we don't really take the full, for example, credit, at this time, for the licensing aspect. But we do have the codes available. For example, the RETRAN has been modeled and the reactor performance, for example, the WNP-2 core, has been modeled and we are able to follow those operations.

MR. CATTON: By your own people?

MR. SHEN: Yes.

MR. CATTON: You do have the RETRAN operational?

MR. SHEN: Yes, that's right.

MR. CATTON: What about a PRA? Could the poeple that

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you hava in this group do a PRA?

MR. SHEN: We hava people familiar with PRA but we're not at this present time -- have developed the codas or the methodology to apply it.

MR. CATTON: Do you plan to?

MR. SHEN: When it's needed, we will.

MR. CATTON: What does that mean in numbers?

MR. EBERSOLE: Before you go back, Dr. Shen, this may be Mr. Bibb's question but I saw something in the plant that I was pleased to see. It looked like maybe you are looking at the unresolved safety issues and doing at least something about some of them. I saw jockey pumps on the spray systam, which I understand that you put on? Am I correct? This is an addition? Would this have followed the course you have here, you decided that you needed them?

MR. BIBB: Jockey pumps for filling the systam.

MR. EBERSOLE: The watar hammer. That's one of the unresolved issued.

MR. BIBB: That's right, yes.

MR. EBERSOLE: Before you put that on, did you examine the need for them and you found a need and you put them on and they're there now; is that the kind of thing that comes under the technology directorate?

MR. BIBB: That type of review, yes.

MR. EBERSOLE: Did they get on there through the process?

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MR. BIBB: I'm sorry, that happened before my time, so I really can't address that specifically. I don't know if there is anybody here who can.

I'm not even sure those jockey pumps were retrofits, if that's what you are thinking.

MR. SHEN: My answer is the same. I think we are in the transition to go with this kind of organization. But in the past the Supply System has pretty much a mixed organization with the project engineering and the central engineering. So a lot of things happened in the past probably go through that.

MR. EBERSOLE: You could have taken up that problem. You have the people to do that, if they brought it to your attention or maybe -- do you bring it to your own attention?

MR. SHEN: We hope there are mechanisms which will bring to our attention automatically.

MR. EBERSOLE: Let me bring you a mechanism that I happened to see. It was in another plant, Perry. I saw hydraulic dampeners and the main feed water swing checks. They weren't put there without reason. I don't think they are on your plant. Does that mean I could find an anlysis in your plant that says you don't need them?

MR. SHEN: I can't answer that.

MR. EBERSOLE: Can I get that answer from anybody?

MR. BIBB: We'll get the answer. I can't answer it off the top of my head, but we will get the answer for you.

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MR. EBERSOLE: Okay, thank you.

MR. NELSON: Jessie, just to not drop the whole issue related to the jockey pumps which was your question, the answer to that question, that was a generic study that GE did actually some time prior to ours. That was already a recommendation prior to our design. So it was an original design.

MR. BIBB: To my knowledge, jockey pumps are on all the boiling water reactors.

MR. NELSON: They are now. They were retrofitted on a lot of plants, but our plant was original design.

MR. RAY: I see the next to the last bullet says "Engineering obtains modification design." Obtains design. Does this mean you don't have the technical disciplines within your organization to actually engineer plant modifications?

MR. SHEN: Let me describe the size. At this time, the engineering has about 150 engineers. Now, if you will look at the normal modification of any nuclear power plants, the total work involved in the engineering would be in the neck of 500 or 600. So we are not -- at least the management has decided that we are not going to have a full spectrum of engineering design capability.

But we do have the procedure and the process to assure the managing of those modification design also with adequate discipline engineers.

MR. RAY: And you will contract the actual design modification.

MR. SHEN: Yes, we have two steps. Number one is we maintain the present AE, as a continuation of AE until we can have most of the design modifications accumulated as time allows us to deal with it. And beyond that, we also contract with about seven or eight major engineering firms at this time that we'll be able to call upon them for any type of assistance including PRA, for example.

MR. BIBB: I want to take just a minute to give you some feel for the number of people and how they are distributed through the company. At this point in time, we are at about 1,740 people or less, or a little less. They are distributed -- I don't know if you can read this from where you are, but within Mr. Glasscock's group there are 69 people responsible for those functions that I mentioned a little earlier.

I will skip over public relations and we have within the financial side about 182 people. And then that support services group, 384. In the organization I havem power generation, there are 551 of those. And all but about 50 some of those people are at the sites, by the way, to give you a feel for that.

We have a small group in the termination group of WNP-4 and 5. On the number three project, there are 117 people and

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on the number two project, under Dr. Matlock, there are 136 people. He will get into that a little bit later.

Number one is 57 people and Dr. Shen's group is 150. This just sort of gives you a feel for how those folks are distributed through the company and the area that they will be supporting the operating plants at a later date and here on out.

MR. MARK: You skipped over the public relations group. I don't really want to know how many people are involved in that, but could you perhaps just give me a word on what it is they do.

MR. BIBB: That's very difficult to explain but I'll try.

MR. MAZUR: Let me try.

MR. BIBB: Go ahead.

MR. MAZUR: We have considerable media coverage. We live in a glass fishbowl and we are besieged daily by the press, the TV. In fact, we had TV interviews this morning wanting to know about something on fire protection. We conduct tours that are at requests. We have all kinds of informational requests of labor through public relations in chamber of commerces, Kiwanis and so forth. And it is through that organization that it is coordinated to try and take the burden off of the likes of us so that we can get on the job.

MR. BIBB: Okay. All right. If there are no further

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questions, I'm going to get into the next speaker, and that is Dr. Matlock, WNP-2 program director. Bob is responsible for the project activities on number two. Prior to joining the Supply System in August 1980 Dr. Matlock's experience included 20 years in the advanced engineering projects including the design and management of nuclear, fossil and solar energy research and development programs. He also served in a senior capacity in the experimental nuclear reactor construction, start-up and operations at the Department of Energy's Idaho Nuclear Engineering Laboratory in Idaho Falls.

Dr. Matlock holds a bachelor of science degree in mechanical engineering from the University of Washington and a doctorate in nuclear physics from the University of Colorado.

MR. MATLOCK: Thank you, Bill. Good afternoon, ladies and gentlemen. As Bill said, I'm Bob Matlock and I'm program director on number two.

My primary responsibility is to manage the completion of construction of WNP-2 and see that the transition from construction completion to a smooth operating organization at number two takes place.

Now, Bob Dodd and Al Toth from Region 5 did an excellent job of giving a good part of my presentation, so I will go quickly through some of the history and what I would really like to focus in on are the quality problems that we had in the past and how we overcame those. And I would also like to spend a short amount of time on documentation since the adequacy of documentation at number two has been questioned and then I will entertain questions.

(Slide.)

You see here a chart from the chronology of number two. Engineering started just prior to 1970, as you were told, and in May of '73 construction began. And progress proceeded. There was an intervening period between 1977 and 1981 when we were besieged with quality problems, and I will get back tp that.

We are now tracking to completion of number two for fuel load in September of '83, and it's achievable without sacrificing the quality of the product and that will support fuel load in February of 1984.

Now, I'd like to say a word about the way that we are organized currently.

(Slide.)

The WNP-2 program. My scope on purpose has been systematically reduced to concentrate just on construction completion of number two. About a year and a half ago, all of the individuals at the number two site were reporting to me, operations, start-up, quality assurance and the construction organization. As you see, subsequently we've made some transitions to reduce ths scope of that activity.

You see on the first line is primarily support activities and the second line is for the technical interface and technical direction with the direction and management contractors occurs at the number two site.

On the left, General Electric, the Nuclear Steam Supply System supplier, and Burns & Roe, architect/engineer, interface directly with project engineering. That's run by Bruce Holmberg, my engineering manager. Bruce has about 10 people in his organization to manage that process. He does also have some assistance from time to time by the Bechtel Power Corporation.

Burns & Roe is responsible for project engineering, engineering and support of completion of the project. They are also responsible for the engineering subcontractors in addition to the architect/engineers that are on the number two site.

We've made a change to that form about a year and half ago. And I will talk to that a little bit later.

Over on the construction side, Hugh Crisp is my construction manager, and Hugh has two major functions. One is to be the Supply System's technical interface with Bechtel Power Corporation who is managing the construction contractors, and also who are engaged in systems completion work.

The other function that carries out, which I will talk more to, that is being carried out under Hugh Crisp's organization is quality verification program. And this gets to the issue, Mr. Ray, that you brought up of the adequacy of the past installed work. And I will talk to that also.

MR. RAY: I notice the broken line from quality assurance back into your channel. What does the broken line mean?

MR. MATLOCK: The broken line means that that function is matrixed to me and the director reports to corporate quality assurance.

MR. RAY: So a solid line, to complete this chart, would indicate a route to the top.

MR. MATLOCK: Yes.

MR. MARK: Am I right in thinking that Burns & Roe is no longer any part of the picture, but Bechtel has taken over all of that?

MR. MATLOCK: No, that's not correct. The organizational changes that we made about a year and a half ago would follow him. At that time, Burns & Roe was the architect construction management on this project. And they were not only responsible for the engineering, but they were responsible for managing the various erection contractors, a half a dozen or so, in getting this job done.

One of the changes that we made was to assign that construction management responsibility for those erection contractors to Bechtel Power Corporation. We assigned undivided

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responsibility for engineering and support of completion of WNP-2 to Burns & Roe, and reduced their management effort in supporting this project. Burns & Roe is the architect/ engineer on this project.

MR. MARK: That helps me. Now, just totally irrelevant question. I heard this morning in one of the conversations with some of those admirable people that showed us around the estimate that there were about 5,000 people involved in this project, give or take, at this time.

MR. MATLOCK: Yes, that's right, about 5,300 on site.

MR. MARK: Excuse me?

MR. MATLOCK: About 5,300 on site today.

MR. MARK: That number will, about a year from now, if everything goes well, drop to about 1,000?

MR. MATLOCK: That's approximately correct, yes.

MR. MARK: Thank you.

MR. MATLOCK: Now, I want to talk just for a minute to major organization transitions that have taken place and that I see taking place between -- up to the time that the site responsibility flows over to the plant manager during fuel load.

(Slide.)

As I mentioned at the outset, a year and a half ago all of the people on the site, all the Supply System people on the site were reporting directly to me. That included quality

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assurance both for the project and for operations that included plant operations and start-up, and it included construction organization.

I did that for a purpose. We did have a great deal of difficulty at that time and we had quality problems and were shut down. It was a necessary action from my point of view in order to get reorganized, get back in shape and get on with constructing the plant. We've done that now and we are in a construction mode, we are in a restart mode and a construction mode and clearly, as Bill or somebody pointed out previously, we're moving rather smartly into operations phase. This is not all that long until we are going to be loading fuel.

There's a need for plant operations department, for instance, and testing start-up to belong now to generation. We did this, as you see, in this second and third line, in the spring of this year. In the fall of last year, as a matter of fact, we transferred the quality assurance department director to report to the corporate QA organization, and they are also matrixed to the operation, the plant operations group now.

And then in April of this year, Roger Johnson, who was and still is my project quality assurance man, who was reporting directly to me, now he does report directly to Bob Glasscock and corporate quality assurance. And Roger

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Johnson is matrixed to me.

The last two items that I am looking at in the way of major organization transitions, the next to the last one is the assumption of design responsibility and control by the Supply System, and that issue, I believe, was covered sufficiently by Peter Shen. Ultimately design responsibility and design control for that plant will vest with the technology organization. As Peter described, we are transitioning into that mode now.

Then the phase-out of the construction activities and turn-over responsibility for the site to generation, to Jerry Martin, in September of '83. Those are things that we are working on and planning for and planning for the reduction of the staff from what it is on site to that number of about 1,000 that Dr. Mark mentioned.

Now, I want to come back to those ---

MR. RAY: Dr. Matlock, before you go on, I notice from the chart that Mr. Johnson has 16 people in his QA organization.

MR. MATLOCK: Yes, he does.

MR. RAY: And of course that's Supply System personnel.

MR. MATLOCK: Yes.

MR. RAY: How many people, total QA responsibility, contractors as well as your own organization, would you estimate are at this number two plant?

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MR. MATLOCK: I believe that ---

MR. JOHNSON: I'm Roger Johnson, QA manager at WNP-2. And these are just rough estimates, but in addition to the 16 QA people in my organization, Bechtel has 9 QA people and approximately 100 QC people performing first line QC functions.

Burns & Roe has about 5 QA people and each of the site contract organizations have both a QA and QC organization combined. And we have about 5 acting site contractors now. And their organizations will average about 9 to 10 people.

MR. RAY: I'm estimating from what you say -- unless my arithmetic is completely wrong -- 200 to 250 total people on the project whose responsibilities are quality.

MR. MATLOCK: Yes.

MR. JOHNSON: It was closer to 300 actually. I just counted that up and looking across, Bechtel and the Supply System organization and the contract organizations, it approaches 300.

MR. RAY: Would you venture for me an estimate of what it was in 1980?

MR. JOHNSON: Let's see. That would have been 81 people in the integrated organization plus about a little -- a little over 100.

MR. RAY: So it's more than doubled.

MR. JOHNSON: Yes.

MR. RAY: Thank you.

MR. MATLOCK: To come briefly back to this chronology, I've indicated in red the areas and time and the issues that were confronting number two. As Region 5 people pointed out, actually our problems and difficulties with number two started back in March of '77 and major civil, structural and piping mechanical was defaulted at that time. The project, as Al Toth mentioned, was shut down and it was shut down by the Supply System in the June-July time frame in 1980, and we spent that ensuing year, between June of '80 and June of '81, on two major tasks.

And one of them had to do with addressing -- with developing a method for addressing past quality problems that could have occurred. Part of that exercise was also addressing and improving our ability to do quality work on into completion of this project. That was one of the major exercises.

The second major exercise was to completely reschedule based on the project and we did that in the spring of '81, and that's the schedule and plan that we are wokring to now for project completion.

(Slide.)

Now, I would like to address the July stopped work. The problem was the construction quality wasn't being achieved. We identified problems. There were tangible quality problems that were identified. Actions to that time -- those actions had not been successful in keeping backlogs of unresolved issues down and keeping problems down. As a matter of fact, they were increasing.

The recovery process that was selected was in two parts. One part we refer to as the Restart Program and that was going through a great deal of internal scrubbing and reordering in our house to develop a system whereby we could assure ourselves and the Nuclear Regulatory Commission that when we did start work up again to completion of construction that we do it right.

The second part was the quality verification program, and that was a program that was directed at going back and looking at the previously installed safety-related work at number two and assuring ourselves and the Nuclear Regulatory Commission that what had been previously installed was adequate.

Specifically the Restart Program included all of Class One and/or seismic one complements instructions and assistance. And things that we did, we went back into the contractor organizations, including our own, reviewed and evaluated the QA programs and work procedures, and inspection procedures and management control systems and made a substantial number of modifications there. Some statistics are that there were upwards of 700 procedures that were either modified and/or rewritten across the system and we estimated that there was

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about 100 man-years worth of effort directed specifically at that scrubbing process.

Changes were made to assure that in the future that there was going to be a compliance with the specifications in the codes and standards and that the management control systems were in fact implemented.

MR. MARK: This is a rude and unformed question. In spring of '80, I think you said, the WPPSS, etc., decided to sort of step back and take a look at things; am I giving the correct picture?

MR. MATLOCK: Yes.

MR. MARK: Now, who are those people? Where do they exist? Those five guys who live on Wall Street or are they five guys who live in Seattle, or where are they and what is their main interest and how did it happen that they decided to step back and look at things?

MR. MATLOCK: One of them is right here. As a matter of fact, this is the guy that shut it down. And I don't know, do you want me to put words in your mouth or do you want to ---

MR. BIBB: Go ahead.

MR. MATLOCK: There was no question that there were difficulties on number two in the way that the work had been carried out because there was tangible evidence. There were indications of -- they were missing welds, there were welding problems and there were quality problems that had to be dealt with.

MR. MARK: There were problems, I understand that. But who was the management, who was the governing group that took a look at this thing and said we've got to do something? Where do they exist, who are they, how many of them are still in the business or have their hands still on the -- where things go?

MR. MATLOCK: Specifically, I'm just not equipped to --

MR. MARK: I don't want names or anything of that kind.

MR. MATLOCK: -- to answer that question directly. I was not here at the time. However, I believe that this is probably one of the few people who are remaining in the organization. It was Bill's -- at his initiative that the safety related work was stopped in June.

MR. MARK: We are always asked, you see, and we plague ourselves with questions about not merely human factors, stuff having to do with operators and that sort of thing, but we are very anxious to know if they can. And it's very difficult to know what one can know about management. And this is a tremendous instance of management.

MR. MATLOCK: Would it suffice to say that we have had substantial turnover in the Supply System in the last couple of years.

MR. MARK: Would you say a few words?

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MR. BIBB: I'll try to answer some of that. I was moved to WNP-2 in -- I believe it was December of '79, and at that time there had already been a well established list of problems that had been identified through the process of the existing project management at that time.

My task in being assigned to that project was to review that and try and make some determinations as to just what the status of that project was. We set about through some task forces to do that. We assigned some people into the mechanical contractor's organization to get a better feel in depth of the problems. We have a few documentation deficiencies.

Weld records, for example, they were not -- they were called forgeries and that sort of thing, but what they were in fact was -- I guess I could call it laziness on the part of individuals who either failed to put a date on or to sign the sheet, that sort of thing. But there were multitudes of those kind of things.

It was just that the records hadn't been religiously maintained. So through that process, we reviewed all of that. The sacrificial shield wall that the NRC folks discussed a little earlier was a hot issue at the time. The fact that we had two segments that had not been welded together, but in fact had been welded to shims. The NRC and the Supply System and Burns & Roe were involved in that, and that process came to a head through the task force reviews that we had.

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So by the first of June, I guess, of 1980 we had pretty well established that we had serious problems that we had to do something about. And that came to fruition on July 17, 1980 when I signed the letter stopping the project, stopping all work on the project until we could bring this thing together.

Now, that was followed immediately by an immediate action letter from Region 5 that was in agreement with the action we had taken in stopping the job. And those activities that have been discussed by the NRC and by Bob were set into place. And we spent the next, I guess, 14 months or something like that getting that project restarted. It involved those 100 man years that Bob talked about.

There were, for example, about 550 engineers pulled together in the mechanical contractor's shop for the purpose of in depth review of every single document they had. That process is just now winding down, just finishing. We were able to, on May 31 of last year, restart some of the work through that process of in depth review. It came to the point that each package was reviewed and approved at either my level or Bob's level until we finally got some substantial successes behind us and saying yes, we now understand the problem, the depth of the problem. We know what to do about it.

And that was just a growing process as we put more of

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those packages behind us. We got more of the work restarted on a slow gradual basis until now, we're now back to full speed construction.

MR. MARK: I think what you said is very helpful to me. I am also reading into what you said -- although you didn't say it exactly -- that this effort, this realignment and restart, carries with it the full cooperation of the -- whoever they are, the ultimate management.

MR. BIBB: Yes.

MR. MATLOCK: Yes, I think that's true.

Most of these items that are on this graph I have talked about. But there is one item, the bottom one, that means a great deal to me and contributes rather significantly to the cleansing of past problems and identifying past issues and getting them resolved.

One further action that we took in the later summer of last year was to terminate the mechanical -- the then mechanical contractor. We assigned the balance of the mechanical contract work to Bechtel. What that did, with hindsight, is force a detailed and complete review of all Section 3, all ASME code paper because we changed out the code responsibility. And that was a horrendous undertaking. It took, as Bill said, about 500 people the better part of a year to accomplish this, and it's now accomplished, and I will about that documentation review and evaluation program here

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subsequently.

(Slida.)

I spoke about the restart program, things that we did, changes that we made in the system, controls, etc., so that we could show ourselves and others that work that was done, is being done now and will be done between now and completion will be done right. By the way, I notice a very high degree of success. But once in a while we run into a problem where we have a system in place where we find the problems when they occur and solve them.

The other part of the quality issue that we had to address was past work. That was addressed under an on-going program called quality verification.

(Slide.)

This is something that we developed with Region 5 that will be completed some time in the spring of '83, it's currently scheduled for completion in March of '83. The scope is all past quality class 1 completed before the shut-down. It involved a documentation review, a hardware reinspection and random sampling in each system -- in each area of at least 10 percent.

The major elements had to do with past work done by contractors that are currently working on the project. Those re-evaluations and reverifications of the past work have been done by those contractors and overseen by Bechtel, and have

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been carried out according to procedures that were pre-approved by us.

For pre-purchase and inactive contracts, we pre-purchased the equipment and provided it at the site and we, the Supply System, were reviewing the pre-purchased and inactive contracts for possible past deficiencies and identifying action items to clean up any problems.

Then there were special tasks. For instance, one thing that was done was to go into the numerous deficiencies that had been identified in past contracts and look at their position, do an assessment of the adequacy of the disposition of past deficiencies in the past.

We also, as a result of accumulation of a broad base of data, assessed training and qualification of personnel who were -- that were on the project in the past. And we report that now on a bi-monthly basis and have been doing that to NRC for about a year now.

(Slide.)

What we found. The top bullet says the construction problems found by that quality verification program were in fact being identified by the project and other special tasks. What that really means is that in spite of the intensity of the ongoing quality verification program, we have not uncovered any other generic or general categories of problems at number two.

Now, that would be other than the ones that we have already discovered and are working on. As I mentioned, the deficiency document reviews is one of the special tasks and do indicate the past technical dispositions were adequate.

We have identified and resolved or arein the process of resolving a number of issues and this program gives us confidence that the work completed prior to July 1980 was by and large adequate with the exceptions of those problems that we have already found.

The program is accomplishing what we wanted it to do. It is giving us a substantive feeling about the adequacy of previously installed work.

(Slide.)

Now, Contract 215 is the past mechanical contractor. And I told you that about a year ago we changed out that contractor and put them to work just reviewing their documentation, bringing it into shape so that code responsibility could be transferred for that work to the Bechtel Corporation who was going to complete that work.

On the right is the substance of that review, that list of numbers gives you an idea of the size of the task.

(Slide.)

The first three bullets list numbers of items that were reviewed. The first one, 14,000 purchase orders. Three of those had about 3,000 separate items within each one of them.

So there was substantially in excess of 14,000.

A number of installation packages were reviewed. A lot of non-destructive examination records were reviewed, about 55,000. In fact, all of the Section Three welds for this contractor were reviewed, about 2,700 of them. And as a matter of fact, we found some problems. We repaired about 80 welds that were outside of "allowable."

The bottom line there in that documentation review was that after a number of exceptions and/or deficiencies were identified, it resulted in about 1,000 nonconformances. That is, about 1,000 instances where repairs have to be made, something new or different had to be done, something had to be cut out.

The point of this, of these two view graphs is that we were concerned -- a number of people were concerned for some time about missing documentation, that just not being there was really giving us a problem. The point is the documentation really was not missing; it was not very well organized and it was an organizational problem primarily. What we found was that was -- that which was there, when we got it organized, it was acceptable, it was quality documentation, and as a result we had minimal hardware impact from missing documentation.

MR. RAY: I have to comment that this is an impressive record in view of the degree of degradation -- if I can put it that way -- to which the QA program had descended by 1980.

MR. MATLOCK: Well, there has been -- I have to note that there has been a dedicated effort by everybody on this project to get those past problems identified and resolved and get back up working and get things done. And one of the things I was going to do was go through the recent accomplishments that we have made on the project. But they have already been outlined three or four times, so I won't do that.

(Slide.)

Now, my conclusion at this point is that we do have an experienced design and construction organization and we are converging on project completion. We essentially have the past problems behind us and now we're finishing number two and we're doing it right.

We've resolved or are resolving a lot of past problems and we have controls in place and verifications means to assure that the designs we've got are correct and that the construction in accordance -- is in accordance with that design. That's called the plant verification program, and it's a separate program, started at the number two project. It now reports directly to Bob Ferguson; John Honekamp will be talking about that next.

And finally, we have planned and are in the process of implementing an orderly transition from construction to operation. This is the first big operation that the Supply

System will have and we are considering not only completion of construction on number two, but also the transition of the various organizational elements within the Supply System to support that operation.

(Slide.)

It is in the form of a plan. These are the major elements. Construction completion, of course. And that is primarily our schedule and plan for completion. We have activities going on establishing organizational readiness; assumption of engineering responsibility by the Supply System, for instance, is part of that activity.

Operational readiness. The training is doing an intensive program in Bibb's organization to make sure that we are ready to operate.

And then finally, the plant verification program, which cuts diagonally across everything that's related to number two. I'll say no more about that.

And if there are no questions, I will turn the podium over to John Honekamp and he will speak to the plant verification program. Thank you.

MR. MAZUR: Mr. Chairman, I'd like to just have the record reflect one slight slip of the tongue by Mr. Matlock in his opening remarks, that has to do the fuel load at this plant. I believe he referred to fuel load in February of '84, that commercial operation. Fuel load is actually 9 of

'83.

MR. MATLOCK: Did I really say that?

MR. MARK: I'm not sure this question fits in exactly here, but maybe it does. It may not fit in anywhere.

You've got an absolutely marvelous site, of course, namely absolutely completely removed from everybody. To what extent does that diminish your commercial capability? I mean, as you understand we on this committee are concerned from time to time with siting, and if all the plants in the country could be put here, that would relieve that problem.

Does it mean that your power costs one percent, 10 percent, 100 percent more at the places where it is needed, or what? Can you just say a simple sentence on that point? Is it costing you a lot or is it really quite manageable? And sites could be removed if people would only make up their minds to do it.

MR. MAZUR: I sort of apologize. There were a lot of things flying back and forth in here on this and I didn't quite get it all, but can you sort of summarize the question? It had to do with power costs as related to ---

MR. MARK: Well, we as a committee, living as a committee in Washington, keep talking to ourselves about siting, you know. It would be nice to have sites away from places that would be terribly bothered. Here you are in such a site. The places where your power is needed are not very close to

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here.

MR. PLESSET: I think this is a kind of generalized question.

MR. MARK: It's a very general question.

MR. PLESSET: And since we are way behind, we'll let them think about it and discuss it.

MR. MARK: Perfectly fine.

MR. MAZUR: I will provide you with some information.

MR. PLESSET: Send him a little note.

MR. MARK: Or pass the word in the hall.

MR. HONEKAMP: My name is John Honekamp. I report to Bob Ferguson. And I understand, Mr. Plesset, that you've asked that I reduce my remarks to about 15 minutes, so what I'll do is try to -- I'll be skipping many of the view graphs that are in the hand-out that you have.

(Slide.)

One of the major points I wanted to make is that the process that Bob Matlock referred to is the plant completion plan which started actually back in January of 1980. About six months after Bob Ferguson took over as the managing director, or roughly about the same time that the work was stopped, the intent of the acceptance review process was quite clear from Bob's directive.

He had really had two things in mind. He wanted a process that would assure him of a well documented basis for

58 his acceptance of the plant and its readiness to operate. And secondly, it specifically addressed the problems that were being encountered at WNP-2 at that time. And what he was asking for is assurance that the construction quality deficiencies that could significantly affect safety or performance would be identified and corrected.

So that's what started the acceptance review process which ended up being called the plant completion plan which Bob Matlock has already identified.

An element of that is plant verification. And Bob ticked off the elements that were there, construction verification, design verification, operating verification and so forth.

The approach we have taken to convincing ourselves that the plant is designed and constructed in accordance with our commitments is, first, to pull together in one place those things that we have done in the past and those things that we were planning to do and take a good hard look at them and see if they made a complete set.

To provide the objectivity and independence, I was moved to the managing director's office to provide direct overview of the program and its development, its implementation. We have contracted with an outside technical auditor to provide independent review of the program scope and audit the implementation of the program as it's developed; and then the

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activities that are addressed under plant verification will be tracked to completion in the plant completion plan so that the managing director will have in front of him the documented basis for his acceptance of the plant by the time it is completed.

(Slide.)

Now, what I want to do now is just focus in on one aspect, since you've asked me to shorten it, that is design reverification, or quality of design, which is the other part we haven't talked about. And I will try to just rush through that quickly. Stop me at any point.

The basic evidence that you've got that a plant is designed correctly really comes from two things. One, the design process that was in place at the time that the work was done. And secondly, a requirement to design reverification that we are doing now with independent people who were not involved in the original design.

Now, the basis evidence that the process that was in place at the time was sound comes from several things. One, the QA reviews and the audits of the design process that was taking place at that time. I'm talking here about audits done by Burns & Roe corporate QA organization at that time, some 80 audits that corporate QA of Burns & Roe did on Burns & Roe project.

GE corporate audit is done on the GE design organization.

Supply System audits of the Burns & Roe design organization and the GE design organization.

In addition to those, we've had external technical audits, design reviews. By technical audits, I'm talking about audits done, for example, by the off project Burns & Roe people of the Burns & Roe design engineers at a technical level as opposed to a quality assurance program level where they actually came in and checked calculations. And it's done, I think, twice a year on each discipline by the Burns & Roe organization.

In addition there are GE interface reviews that are performed both in process and then some formal periodic reviews where they come in with a team of people to review a preselected list of N-triple S interface items with the Burns & Roe, the AE, to make sure that those interfaces have been properly addressed.

MR. EBERSOLE: Could I take a point here and just take a case in point, and I will pick the crane, the 125-ton crane. Have you looked at the -- what I'd guess you just have to call the guts of that questing device, the pillow blocks, the teeth designs, the brakes, the cables, the potential for the crane disgesting itself if its limit switches don't work?

MR. HONEKAMP: Have I?

MR. EBERSOLE: Yes, is there buried in this kind of review a study of such a thing as that to insure yourself that

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you won't drop a 125-ton cask sometime?

MR. HONEKAMP: I understand what you're saying. The -- buried in the first docks under the first bullets -- I can't address the specific thing on the crane without getting into a lot more back-up information. I can tell you that there have been substantial Supply System technical reviews of the design of many, many elements as the plant design evolved. If you will bear with me a second, I can look back and pick off some examples here.

MR. EBERSOLE: One aspect of this that I just referred to was frequently the designers of a hoist or a crane or an air compressor or whatever will enthusiastically put too much horsepower available to the shafts so that when some little switch fails someplace, the machine proceeds to digest itself.

MR. HONEKAMP: I understand what you're saying. The only thing I'm telling you is I don't know -- I can't put my finger on a piece of evidence right now that's at Supply System or some external organization looked at the crane on February 27th.

I can tell you there are just numerous examples of independent technical reviews, either by off project Burns & Roe people, GE on Burns & Roe, Supply System on GE or Burns & Roe. We've looked at large numbers of technical issues in addition to QA audit.

MR. HOLMBERG: John, I have a specific answer to that question. We, in reviewing -- oh, I'm Bruce Holmberg, I'm the manager of engineering at WNP-2 for the Supply System.

I do have an answer to the specific question with regard to the crane. We have a group of Bechtel engineers assigned to me as consultants in this. During their tenure on the site here, they have looked at various aspects of our design and what we have done in response to various questions from the NRC. And this particular case, we had Bechtel send in a crane expert to look at what we had done with our crane, with regard to the testing of the crane to ensure that we met the particular requirement. And we do have significant review of the crane as it is currently installed.

MR. RAY: Mr. Honekamp, there's something you said a moment ago which I'd like to have clarification on. External technical audits and design reviews by the various agencies. Do I understand from something you said in response to Mr. Ebersole that you've had GE audit technically the adequacy of design on the part of Burns & Roe? .

MR. HONEKAMP: No, that's not what I said. I said there have been periodic reviews by GE of the GE-Burns & Roe technical interface to make sure that the information transferred across is correctly transferred.

MR. RAY: Okay, the interface. Okay. And when -- another question. Has the -- have you or do you plan to have Supply System, your organizational QA audit the audits by these organizations on a sample basis?

MR. HONEKAMP: Would you repeat? I'm not sure I understand your question.

MR. RAY: Does Supply System -- has the Supply System or does it plan to have their own QA organization audit the audits that are conducted by these organizations?

MR. HONEKAMP: Okay. Supply System -- the answer to that is yes, and they have been.

MR. RAY: They have done?

MR. HONEKAMP: Oh, yes. I buzzed through a lot of numbers real quick for you, but basically I think over the 10 years or so that the design process has been going, there's been some 40 audits by corporate QA of the Burns & Roe design activity in addition to the Burns & Roe QA audits of their own design activities.

MR. EBERSOLE: I guess what I was trying to get at was do you do -- when you do something like this, do failure modes and effects analyses and look at such things as not merely what we call adequate design but maybe excess adequacy? For instance, if you've got big valves out in the plant, if I stick the torque switches or limit switches, do the valves proceed to shear their stems? And if so, does that imply valve destructive process if I get too much pressure instead of too little pressure? Am I in trouble if I get too high a voltage on the DC system instead of not

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enough? Am I in trouble? I'm poking about, you know, both ends of the spectrum.

MR. HONEKAMP: I understand what you're saying.

MR. EBERSOLE: You have policies that make you look in all directions.

MR. HONEKAMP: What I'd like to do, I guess, if you want to get into that, is defer to Doug Timmins.

MR. EBERSOLE: Well, I don't know. It may not be appropriate to the schedule here.

MR. HONEKAMP: It depends on, you know -- what you're talking about is the level of technical review that's gone into this whole string of activities that have gone on for the last 10 years. And I don't, I really can't answer in that kind of detail.

MR. EBERSOLE: In many cases, it can be too much of a good thing.

MR. HONEKAMP: I know what you're saying. You're saying that -- just because it's heavier doesn't necessarily mean better.

(Slide.)

Bruce Holmberg already touched on one aspect. There is a separate Bechtel AE group that is assigned to the project engineering organization at WNP-2 to assist them in the management of the engineering activity on WNP-2. And they have looked at some 300-some areas there when they first came in, issues that Bechtel engineering was aware that are problems on other plants throughout the country to assure themselves that there was a program in place in Burns & Roe to address those type of issues. And then they would spot check things in depth.

So this is a technical group over and above the QA type review that we're talking about. And then I've already mentioned Supply System technical overview. For example, the kinds of things that would involve in the time period where the specifications were being developed. Supply System was directly involved in review of the specifications for technical adequacy.

(Slide.)

In '77, the Supply System did a series of design reviews. They started with the review of the Burns & Roe design process and then a selection of 32 systems were reviewed. These were multi-disciplinary reviews with findings documented and resolved.

It covers main steam, extraction steam, condensate, feed waters, the long string of systems that were reviewed at that stage of the design by the Supply System.

Now, what we are doing -- and this is basically what I'm talking about is what has been done in the past. If you go look at the record of what has been done in the past, it would convince you that it was -- the design was adequate.

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On top of that, we are in the process of doing right now a requirements and design reverification review. And it consists of three elements. The first two are very closely tied with the engineering transition activity that both Bob Matlock and Peter Shen talked to you about.

The first element is basically a review of the engineering record on a system by system basis. It's a completeness review. Do we have the engineering records that the Supply System people believe they have to have to assume design control as we get it from Burns & Roe. You can view it as a technical turn-over process of the data coming from the AE to the Supply System.

That review is done -- we make an -- in that case we make use of some Burns & Roe people who actually assemble the record. In the review of the design requirements, what we do then is for all safety systems we take the engineering record that has been compiled and review it against an independent check list, basically an NC45211 design input checklist. Does this engineering record contain a clear documented basis for the design.

And then the last thing is a detailed review of three selected systems. If you will go on.

(Slide.)

MR. EBERSOLE: Pardon me, what were those systems?

MR. HONEKAMP: It's RHR, the suppression pool cooling.

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That's what I thought was the next view graph but I guess I got them out of order. RHR, suppression pool cooling, HPCS including the diesel feed all the way back to the feed pumps including the transition from Section 3 to B-311, QC-1, QC-2 Seismic-1, Seismic-2.

We picked those systems based on the criteria that they are all important to safety. They contain major design interfaces between AE and the N-triple S vendor, and they have an appropriate or at least a meaningful distribution amongst mechanical, electrical and INC.

MR. EBERSOLE: At the time you did the RHR, suppression pool cooling mode, did you consider that if you really need an RHR in an accident mode that you presumably, at least the design basis is, you would only have started with one because the other on a random basis didn't start. And then you would be dependant on the single one left for a rather langthy period, and that one should consider whether you must pick up the option of maintaining and restarting the other one under dirty conditions? Or has some way out the back door like venting the containment?

How did you rationalize what you did?

MR. HONEKAMP: What I'm talking about here at this point are design reverification reviews that we are doing now. The purpose of these reviews we're doing now is to confirm that the plant was designed in accordance with our

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required commitments, our requirements, as we stated them in the FSAR.

MR. EBERSOLE: Well, it wasn't an examination of the basic philosophy?

MR. HONEKAMP: No, sir.

MR. EBERSOLE: Who does that?

MR. HONEKAMP: That was done in the original ---

MR. EBERSOLE: Is there somebody in your organization who looks at the real root philosophy, like this maintenance problem that I talked about? Shall there be two pumps? Is that enough? Should there be three or four or five, shall I maintain them after an accident or not; if not, what's my basis for believing that one will run for 90 days? This sort of thing, who does that?

MR. HONEKAMP: That was done in the original design. We're not re-looking at the original design basis.

MR. EBERSOLE: That's GE; is that right?

MR. HONEKAMP: If GE was Supply System's technical overview, but the basic GE design was accepted.

MR. EBERSOLE: I see, thank you.

MR. HONEKAMP: What I was just trying to do here was just quickly give you a feel for the scope. What we are trying to do with these three reviews is to confirm what we believe is the case that the reviews that were done during the design process were adequate and demonstrate that we had good

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control of the quality of the design process. So it's kind of a last look at the end to make sure that what we did and what our records tell us we did is in fact supported if you look at it again today.

MR. EBERSOLE: But that's based on a handed-over philosophy to you from your supplier.

MR. HONEKAMP: We checked the design requirements as design inputs against independent check list that bases it do you have system functional requirements, are they defined and do they make sense. But we're not going back into the original safety analysis that was done by GE and has been thoroughly reviewed by ---

MR. EBERSOLE: It's real simple. I have a bad accident of some sort. I have one pump that didn't start. Both of them are all dirtied up now. By what right do I figure it's going to run 30 months -- I'm sorry, 3 months?

MR. HONEKAMP: I hear what you are saying.

MR. EBERSOLE: Who looks at that? It looks like -- usually the user utility would look at that sort of thing from a fundamental philosophical viewpoint. And convince himself it's all right or it's not all right. Who does that?

MR. NELSON: Are you referring to like operational feedback or experience feedback kind of a system?

MR. EBERSOLE: Whatever is your rationale for believing that these things will run the way that they have to do.

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MR. NELSON: And you're really concerned at this point in time with after the plant is operational, how can we determine what the plant maintenance schedule, surveillance schedule, that sort of thing?

MR. EBERSOLE: No, I'm talking about the original hypothesis.

MR. NELSON: Oh, was it valid?

MR. EBERSOLE: Yes. Do you have any program where one looks at the original hypothesis?

MR. NELSON: I think John probably has a better view of that.

MR. HONEKAMP: Actually we have no unique program to go back -- as I understand your question, you're talking about post-accident equipment operation that forms the basis for the system's reliability.

MR. EBERSOLE: Another one is a simple one. We've got this closed dump volume for the scrim system. Is it rationale to dump the rods into a closed volume or would it be more rationale to not wait until you had confirmed closure of the rods before you closed the dump volume. It's a simple thing, root logic. Is the original hypothesis fundamentally sound? I would personally rather see the rods dumping toward an open volume and confirm that they have been set and are home, and then close it. But what we do? We close the volume first, and it's not all that big. But we say that's all right because we put a lot of paraphernalia out there that says we know whether the thing is empty or not.

What this is doing is erecting a set of conditional requirements as a supportive argument that things are all right. It's a lot better not to have to generate these supportive arguments if you can avoid it.

For instance, do you ever think maybe you would like to change the logic of the rod drive as your own operating utility and say I'm going to discharge my control rods to an open volume and then I will close it. Do you follow me?

MR. NELSON: Yes, I do.

MR. EBERSOLE: Because it doesn't seem to make sense that I should close it first. That's based on an old and worn out thesis that a little bit of radiation is going to hurt somebody. You could leave it open to the suppression pool. It wouldn't matter worth a nickel.

It's just root logic and I'm asking you really do you get back and look at these basic root things or, I've guess I've criticized the staff. They would review a concrete airplace if it were brought in to them as thought that's the way it had to be.

MR. SCHWENCER: If it would fly.

MR. EBERSOLE: Do you do that too?

MR. NELSON: I guess the answer to that is from the Supply System point of view where we're mixing really

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construction with operation. But the answer is that we would evaluate that kind of input from whomever it came from. In this case, we're specifically of course talking about the design criteria for the CRV system is set by General Electric Company. And we would evaluate their input to us.

I think the answer, you are saying, is do we go back into their shop and find out who made that original decision to close up the down scram volume ---

MR. EBERSOLE: Yes.

MR. NELSON: -- and was that a good decision. And the answer to that is probably no except that we are also not a closed mind. We would ---

MR. EBERSOLE: Good.

MR. NELSON: -- evaluate any new recommendations that may come.

MR. EBERSOLE: You are telling me you are going to think about these things?

MR. NELSON: Certainly. We would all the time.

MR. EBERSOLE: Who's going to do the thinking in your organization?

MR. NELSON: We're talking about managers. That's his responsibility to see that that happens and we have an organization that feeds that kind of information to him.

MR. EBERSOLE: I see. Thank you.

MR. HONEKAMP: I don't know how much further you want

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to go into this.

(Slide.)

The next thing I had was the requirements reverification and design reviews are the selected systems. We've structured that program with a lot of external visibility to make sure that there's little question by the time we get done that if there were findings that they are out on the table and they've been addressed. We've done it by the independence of the reviewers. The reviewers were people who were not involved in the original design. They are Supply System people for the most case. They report to Peter Shen in technology, not to Bob Matlock.

We've structured a findings review committee independent of that organization that reports directly to me that receives all the findings to assess their significance. I have responsibility for direct oversight of the program, which includes the scope of the design reviews, verification or I should say approval of the selection of the people to assure that they are in fact independent, they are not reviewing their own work.

And then of course we have program review and audit by an outside technical auditor.

(Slide.)

MR. RAY: Who were the members of your plans review committee?

MR. HONEKAMP: All right. It is Larry Harold who is assistant director of technology reporting to Peter Shen. We've got Herb McGilton who is the manager of safety assurance who reports to Bob Glasscock. Neil Porter, engineering manager for unit one. Barr Bee, a new man who reports to operations. He's in the technology portion -- I should say the technical staff reporting to Jerry Martin. That's it.

Oh, there's also Jerry Sorenson, the licensing manager too.

MR. RAY: You have technical discipline representatives as well as management and QA.

MR. HONEKAMP: They are all senior technical people with many years of experience, it's a cross discipline mix covering electrical, mechnical, INC types.

MR. RAY: Thank you.

MR. PLESSET: I'm going to declare a five-minute recess and I hope you will not trickle away very far. So let's recess for five minutes.

(A short recess was taken.)

MR. PLESSET: Let's reconvene, please.

MR. MARTIN: My name is Jerry Martin. I am the plant manager at WNP-2. It's a pleasure to have you folks out to the site today and I have been the plant manager for three years, since June of 1979. And my responsibility during the construction phase has been in parallel to develop a staff

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that would be ready when the plant is ready. I've been asked to cut this presentation down considerably so I'll be moving rapidly. I would like to address some of the questions that came up earlier on staffing and hiring.

(Slide.)

As I get into the presentation, this first slide shows the plant structure as one item. But it also shows the on-site nuclear experience. In the process of staffing, the policy that we used was to hire those people with directly related experience as much as possible. In other words, those that had been involved in the commercial nuclear power plant field and particularly in the operation of boiling water reactors.

So on-site presently I have 239 people essentially staffed. We're shooting for 240, so we're there. Of those 239 people, the total nuclear experience adds up to 1,861 man years. And of that, we have greater than 600 man years of BWR experience, commercial experience. Of that is included, however, the number of years that we spent at WNP-2. So that may reduce somewhat from a commercial sense.

I'm going to stay on this slide for a while to answer the questions that came up earlier on staffing. As plant manager, I sign 100 percent of those people -- employees that we hire on. They have been reviewed by the six department managers that report directly to me and upon their interview --

the interview process, the psychological exam -- we use the Minnesota multiphasic -- plus the physical examinations and a review of the ANS 3.1 requirements, and a personal interview. That's the selection process. So the employees that I hire I do sign 100 percent of those people.

MR. MARK: You spoke of the number 240. Is that the number of live bodies that will be at that plant when it is running? I thought it would be a much larger number.

MR. MARTIN: Yes, that number is strictly represented on this chart as those directly reporting to me, the plant manager.

MR. MARK: Okay. They have managerial status and you have under them another 700 or so.

MR. MARTIN: No, no. Let me correct the -- the 240 include all of those on the permanent plant operating staff that is accounted for in these six departments. That includes as we go across the chart, on the far left, the maintenance department, for example, I have 76 people. That includes all the craftsmen on the plant -- permanent plant maintenance staff.

In the training department, the next one, are 16 counting the training manager and his training engineers, there are 16 of those.

Operations, there's 71 right now.

Administration, there's 22.

Technical, there's 24.

And HP/Chemistry, there's 28. And counting myself and my secretary, those numbers all add up to 239 right now with the one opening shown as the assistant plant manager.

Now, in addition to that, Mr. Bibb referred to the start-up organization of Mr. Afflerbach as Afflerbach's start-up organization which reports directly to Mr. Bibb as I do reporting directly to Bibb. So that will be an additional. Currently right now approximately 100 people.

Now, to supplement that, we obviously during the peak man loading period of the start-up testing period, we will have on-site extra support. And that's where the number expands from the 240 directly reporting to me to the several hundred other possibly contractors who will be available for support during the power program.

MR. MARK: Now, when you're through that power program, down to operation, you will have operators, senior operators, junior operations and businessmen. This is not included in. this 240.

MR. MARTIN: Yes, they are.

MR. MARK: All of them?

MR. MARTIN: Yes.

MR. MARK: So your equilibrium number after you are in business will be like 240 or 250 or something like that.

MR. MARTIN: That's correct. That's based on a review

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of the operating BWR's in the country.

MR. MARK: That's a tidy number. It's possible then to imagine that your insider saboteur is one of those 240.

MR. MARTIN: That question was raised earlier and let me address that to say that of the 240 people reporting directly to me there could be an insider who may cause sabotage. To preclude against that, we have what we call unescorted access program. For an individual to have that ---

MR. MARK: Don't, please -- our chairman is anxious to conserve time so -- and so am I.

MR. MARTIN: Okay.

MR. MARK: That is a number which is possible for you or for one of your close associates to know all of the guys.

MR. MARTIN: Yes.

MR. MARK: And to at least have a feeling for whether he's having traumatic problems. And that was the kind of feeling I was trying to develop. You have an organization where you have signed the hiring orders, where somebody at least known to you knows them and is in touch with them. And so your insiders are a finite, manageable thing.

MR. MARTIN: Yes. We have a continued surveillance program or continuous observation for aberrant behaviour. All of our direct line managers and the supervisors under them have had -- some have had training. We're about 60 percent complete in this area, but before fuel load they will all --

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all first line supervisors will have had training in the continued observation for aberrant behavior. We recognize ---

MR. MARK: Does this 240 include your guard and security force?

MR. MARTIN: No, sir, it does not.

MR. MARK: That's another 40 or 50.

MR. MARTIN: About approximately 100. And as I go in, I've got a chart that develops the shift organization. Of course, on shift at 3:00 a.m. we have security on site who report through the shift manager.

MR. RAY: Just a brief question. You can answer it yes or no. During fuel load periods there will no doubt be an expanded maintenance program to be conducted. Will you staff your expansion of the maintenance people at that time by contract?

MR. MARTIN: No. Let me make sure I understand the question. My position at the time of fuel load is that the ---

MR. RAY: No, no, refueling.

MR. MARTIN: Oh, okay. On out after the power ascension at refuel, yes, we will have to certainly expand that by contract.

MR. RAY: You don't intend to have an in-house staff that you rotate between the plants, for instance.

MR. MARTIN: When we're a five plant utility, we were planning for that, but at the current point we've had to

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shrink down our organization and we're not currently planning for that.

MR. RAY: Thank you.

MR. EBERSOLE: Mr. Martin?

MR. MARTIN: Yes.

MR. EBERSOLE: I think maybe it's a good thing. I see you have an aversion to committees. We usually say a thing -- maybe to this one even. We usually see on these things nuclear safety review committee, etc., etc., etc., comprised of some members down in the line organizations.

How do you handle -- you take it in the line organizations. You have this function buried in that?

MR. MARTIN: Well, the full presentation went on and developed the total plant staff in great detail, but to answer your question in summary, we have as part of the duties of each of the department managers you see there, they are members of the plant operations review committee. We call it POC. That is the in-plant, in-organization, as required by the technical specifications plant safety review committee.

Now, we are responsible obviously to the corporate nuclear safety review board. As plant manager, we review -- I review all safety related procedures in the committee. If there is any member of the POC that disagrees with my approval of a procedure and my signature, he can go to the higher court, being the corp^rate nuclear safety review board.

MR. EBERSOLE: Well, now you, as the plant manager, you are handed this plant on a platter, I guess, almost. And it's yours to run then. And do you make a physical assessment of what you've got as it is handed over to you and decide you do or you don't like certain situations?

MR. MARTIN: Let me answer that by saying this will be my fifth boiling water reactor and I was responsible, as the operations manager, at Browns Ferry Unit 1 and 2, GKN in Holland, KKM in Switzerland and Millstone Unit 1 under a full turnkey contract with the General Electric Company.

I believe very strong in that I do not wait for the plant to be handed to me. I've had this organization operational now for over a year on shift. During the operation on hydro we had 14 people on shift round the clock. During the really the phase of transition from construction completion on the vessel as it went through its section three code hydro, the pumps were run by the operators, the systems were reviewed by the operational QA engineers.

Our maintenance people were the ones that prepared the plant for this operational hydro and all aspects of taking the pumps apart. I guess what I'm saying in summary is that we don't -- I can't accept the proposition having the plant handed to me on a platter. We take the plant from the point of probational acceptance of any testable component and have had our maintenance people involved in the initial bump and run of the motors, the running of the motors, initial energy ---

MR. EBERSOLE: I guess I'm speaking more in the context of the design than you are.

MR. MARTIN: Okay. In the area of design and in response to your question on the scram discharge volume, having lived with a BWR for a number of years, the issue of the scram discharge volume. As plant manager, I do worry about the control rod drive system, but I have -- it has been proven to me over a number of years that the number of -- well, the operating experience has been good.

And what I worry about on unit two is discharge volume in the sense that the outlet scram valves will open into a empty and an adequate volume. And one way to do that would be to assure that it is drained by piping it to the suppression pool.

MR. EBERSOLE: Brown's Ferry thought that they were drained until they found they weren't drained.

MR. MARTIN: That's right.

MR. MARK: In that chart you have HP/Chemistry. HP is health physics?

MR. MARTIN: That's correct.

MR. MARK: So they're the radiation monitoring provisions?

MR. MARTIN: That's correct.

Again very quickly, these six department managers -- let me just say -- they are all degreed individuals. They all have a substantial number of years of experience. In the interest of time at the request of the chairman, I was going to go into the resumes of each of those but I will just say they are all degreed, all a number of years of experience, and the structure of the plant and the number of 240 came about as a result of a continual review of the industry.

The single unit BWR's, for example, which we are, how many over the years of the plants had to have to operate the plant was a real basis.

(Slide.)

Let me move to further development of the plant organization at this time. This next chart -- I realize you can't read all of the writing on here. It is in the hand-out material. I've already summarized the numbers that gets up to 240. Let me go quickly from left to right.

The first department shown here is training. And I will skip that for just a little later because the rest of the presentation was all on the total development of the training program for the plant staff.

The next organization is administration. The administration manager is the chairman of our plant operations review committee. Excuse me, he is the secretary. The plant manager is the chairman. And the administrative manager is responsible for scheduling the plant operations review

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and assuring that all of the plant procedures are properly scheduled for review. And he also provides the clerical staff who actually produce the procedures on site.

We have written all of our own plant operating and maintenance procedures. There's 1,350 approximately. And of that number we only have 137 left to write. And we are writing these using La Salle's, Brown's Ferry, Peach Bottom, all of the other previous BWR's. And we are refining them obviously to WNP-2 and they are being written by our shift managers whose overall average is just over 10 years in the commercial power plant field.

The third department is the technical manager. This individual, Kirk Cowan, has 22 years. He's a degreed individual. He also has an MBA. He is a professional engineer. His staff of an additional 23 individuals one of whom, Chris Powers, is the supervisor of the nuclear engineering section. Chris will be talking to you tomorrow.

This organization, the technical department, have 21 major programs that they are concerned with. Of significance, the power ascension program is the key one and at the point of fuel load, the loading of the first fuel bundle is done under the first power ascension test program, which is written by the engineers in the technical department. At that point, we on the plant staff really, we feel that's the transition point whereas as a plant now, we function as an organization

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from the loading of the first fuel bundle. Again it's by the plant operations department who loads the fuel and by the plant technical department who has written the procedure and we'll be fully on shift and functioning. In fact, we will be in that mode several months before fuel loading.

The operations department is fully staffed, 71 individuals. And I have one slide I will quickly go over which breaks down the actual shift organization of the plant operations department.

(Slide.)

The operations manager, Roger Corcoran, also is degreed. He is certified at the SRO level and he will be licensed holding a senior reactor operator license on WNP-2.

The maintenance department, as I mentioned, 76 people. We are supplementing that with temporary hires. And as you mentioned earlier, I believe it was Mr. Ray, we will have to supplement that during our refueling outage time with several hundred other maintenance individuals.

And the last department on the right is the health physics and chemistry department. Mr. Graybeal is the manager and I believe his number of years of experience is 27. He set up the health physics program at the Lacrosse boiling water reactor and at the Duane Arnold Energy Center. In addition, he was working with the Hanford Production Reactors for 11 years.

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MR. MARK: Where in that -- I guess you've switched to a new one -- there ought to be somebody or perhaps there ought to be two or three people keeping abreast of the reports of disasters from other reactors?

MR. MARTIN: Yes, sir.

MR. MARK: You know, the valves didn't work or something.

MR. MARTIN: Yes. Every morning ---

MR. MARK: Where does that come into this? It's not the administration manager, not the technical ---

MR. MARTIN: I feel responsible to keep abreast of the industry. And in so doing, I'm a member of the Western States Plant Managers Meeting. I attend the BWR owners group meetings on occasion.

MR. MARK: Good for you. But you can't possibly read all the LER's.

MR. MARTIN: As far as LER's and what I wanted to do is put it in perspective. In so doing that, I receive a daily report which gives me a daily accounting of the significance of events that are happening out in the industry.

Now, to cover the LER's, that is invested in the group that you're referring to earlier as the safety engineering group. When the process starts there, they screen the significant events, bulletins, orders, LER's, and then route them to me and I route them to the plant staff and specifically to the technical department manager for deposition.

MR. MARK: I have this feeling that there ought to be somebody not as heavily involved as you who could view those things and sift them, say here's something we ought to pay attention to because you're going to be on a trip to some place.

MR. MARTIN: Yes, that's what -- that's when I referred to Herb McGilton as the safety engineering review manager for unit two. And it's his specific job to, in his organization, screen those events.

MR. MARK: Right.

MR. BOUCHAY: He reports to assurance -- quality assurance and licensing. He's -- I'm Don Bouchay, manager of nuclear safety and licensing. This group that Jerry is referring to is independent ---

MR. MARK: It's impossibly dull but very important and may take unlimited time just to get that done somehow.

MR. MARTIN: Yes.

MR. NELSON: As you know, the CN program with the INFO/INSEC group looks at all LER's that are issued to the NRC. And they have a program where they evaluate the significance of those events. And that -- Jerry is referring to the CN program which we subscribe to. We also review the BWR specific events. The CN group looks at all of them, the whole industry. So there is an integration there and a

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feedback.

MR. MARK: My question was of course that you have that covered. It wasn't clear to me from this organization chart where it would be covered. And it shouldn't be the responsibility of the plant manager.

MR. NELSON: The answer is yes, we do have it covered. It's covered at the corporate level and the input is into the plant manager's operation staff or technical staff.

MR. BIBB: In addition to that, we have a central group in power generation that collects data from the industry and that is provided as a data base. Information is then made available to each of the plant managers and the staff. That's something that's an ongoing kind of a thing that's fed every day to develop a data base.

MR. MARTIN: I'm interested on the significant events like La Salle going through their power ascension programs having high dry well problems or the Brown's Ferry 3 scram discharge volume. I knew about it immediately. Those significant events is what I'm referring to that ---

MR. MARK: That's what I was also thinking of.

MR. MARTIN: I'm told my time is up.

(Slide.)

Are there any further questions? The shift structure --- Let me skip this slide and go to the shift structure. I would like to cover that.

(Slide.)

As we develop the operations, I want to say that on shift we will have, as shown in your copy and here, a shift manager with a control room supervisor, both senior reactor operators. The reactor operators, equipment operators, the question came up earlier, all report in under this organization. What we have done after Three Mile Island to answer the questions, many questions, we've developed a shift structure to include a shift support supervisor who has responsibilities outside the control room.

For example, he can worry about rad waste. He can worry about administrative details to relieve the shift manager and the control room supervisor. For example, call in overtime timesheets and so forth so that the control room supervisor and the shift manager are freed of those administrative duties.

I'll skip that. It just shows the make-up of our total plant staff.

(Slide.)

And in the training, this is the introduction to the training presentation. I will just use this slide then as an explanation that we cover. We have a very comprehensive training program that includes not only cold license training but all the other required training for non-licensed individuals, maintenance training, start-up test engineers training, health physics training, and we have on the plant staff -- I mentioned 16 people dedicated to the plant specific training. And I will just skip to the last slide which is a summary of the training.

(Slide.)

There are many, many slides on training, detailing our total program. In summary, we are committed to a comprehensive and extensive training program. We have our own plant specific simulator being constructed. We expect to have it ready in the spring or the middle of '83. We have done a college technology program to update the analytical skills of the shift managers. There's a recommendation out of Three Mile Island.

We have committed to having an on-shift technical advisors who are degreed individuals, but I also made the requirement that they have the cold license training so that they would have credibility with the licensed shift managers.

And we have that program moving along on schedule. I mentioned we trained and tested the start-up people in addition and they have been in portions of the cold license program. We have had our program evaluated by the New York Regents and, as a result of the college technology upgrade, we were able to achieve about 42 semester credit hours, adding that to the previous experience of our shift managers who are over the 60 semester credit hours. So we feel that we've met that commitment.

The bottom line, our managing director, Bob Ferguson, has sent a letter of August 6 to Ernest Wilkinson, the president, to start the process of the total accreditation of our training program. We are committed to accreditation of this overall program.

My summary slide. I feel very strong that we have a good plant. I've lived with the BWR and the basis for the hiring of the staff was those who are familiar with the operation and the staffing is there. It's complete. We feel that we're ready and will be ready when the plant is ready. And our training program will complement the experience that we have.

I will conclude with those remarks.

MR. PLESSET: Thank you, Mr. Martin. You mustn't feel that we aren't impressed with your work; we are very much so. And I personally am exceptionally pleased with the effort that you're making. I think it's very good and most unusual. Don't you think so?

MR. MARK: I want to ask one more question. The number 240, which I believe you suggested to us was the equilibrium level of the total operational staff. It sounds like a very tidy shift and I think it's great. Is it not a great deal smaller than most plants come out with?

MR. MARTIN: Let me answer that by saying Cooper Station had 138 people at one time and Cooper has one of the better plant records.

MR. MARK: I wasn't criticizing it from being small. I thought some of them ran more towards 500 instead of 200.

MR. MARTIN: Yes, the numbers are definitely increasing and the 240 in the statistical sampling of all the plant were right in the middle, from Cooper being low to Oyster Creek being on the high end. If you look at all of that, we're right in the middle.

MR. NELSON: And you might refer back to the presentation of Bill Bibb where we talked about a central corporate support staff to the plant manager in operations. So this 240 are the people on site operating the plant. But he also has -- he can drop on support activities that come out of Peter Shen's organization. There are other people within the Supply System that also support him from corporate downtown.

MR. MARK: Fine.

MR. CATTON: I was just curious. One of your bullets indicated that your courses had been evaluated by the New York State Regents.

MR. MARTIN: Yes.

MR. CATTON: I'm just curious how they managed to get some expertise in the nuclear business.

MR. MARTIN: Let me turn to Rod Davidson, our training manager, who had that process -- put that process in place.

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MR. CATTON: What's wrong with the University of Washington?

MR. DAVIDSON: My name is Rod Davidson. I'm the training manager at unit two. And what it amounted to was when we first started what we call out college technology program to upgrade the analytical skills of our shift managers and our control room supervisors, as we felt that it was reflected by the TMI accident. You know, there wasn't enough analytical skills there, so we started a college technology program. We had some guidance as to 60 semester credit hours in certain areas.

And we contacted a local organization called the Joint Center for Graduate Studies. And they are really only responsible for conducting graduate level classes in the Tri-City area. They really didn't do much in the undergraduate area.

We did feel that they had an excellent staff. They did have access to many, many engineering and professional type people in this area that were in the nuclear industry for many years, and we felt that they could conduct a really good program for us.

The problem is they couldn't accredit the program, other than continuing education units. So we looked around and we contacted the University of Washington, Washington State University, Oregon State University, and all of their programs they had really didn't -- we didn't feel they totally met our needs. And they didn't want to change their programs because their programs were already accredited.

And so what we did is we contacted the New York State Regents External Degree Program. They have an evaluation arm called PONCSI. It stands for Program on Non-Collegiate Sponsored Instruction. And so we contacted these people. They arranged to have a professor of nuclear engineering from the University of Wisconsin. There was a professor from New Jersey Institute of Technology and also an individual from the Idaho Falls area that came out as an evaluation panel, and looked at our -- at several of our courses.

They looked at the college upgrade program that the Joint Center actually conducted for us, and accredited that with 42 semester credit hours, college level credit.

They also looked at some of the classes that my staff actually conducts. We have a systems class that was accredited with four semester credit hours of upper division engineering technology. We also had a research reactor training class that was accredited with one semester credit hour of engineering technology.

So the expertise really came from this panel that came out. It was a contract thing really, is what it was.

MR. MARTIN: The college is phase one in your hand-out and I was going to explain phase one and phase two. But the

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phase one is actually thermodynamics, hydraulics, chemistry, really not necessarily nuclear related because phase two then, we put it into the application of the nuclear. You know, these are not necessarily just nuclear courses that are ---

MR. CATTON: That's good.

MR. MARTIN: Heat transfers, thermohydraulics and so forth.

MR. PLESSET: Thank you again.

MR. MARTIN: One other question that was asked about. We don't demonstrate -- on the ATWS question, I just want to say just one or two brief sentences here.

The recirc pump trip, during the power ascension program we do demonstrate core stability in the natural circulation mode. And Chris Powers, the supervisor of our nuclear engineering section, will address that question. But in any rod pattern, as you trip the recirc pumps, we will demonstrate as we coast down the power to flow map, we will go down into the natural circulation mode. And we will demonstrate core stability.

MR. CATTON: Well, the SCR now says that you can't use that for circulation.

MR. MARK: It's not merely you can't use it. It isn't allowed.

MR. CATTON: That's what I mean, it isn't allowed.

MR. MARTIN: It's not a normal operating mode. It's

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out of the envelope of our power to flow map that we have in our technical specifications. However, during the power ascension program, we go through all the major transients. And one is the demonstration of natural circulation. And we also go out of the envelope to cavitational search on the jet pumps and recirc pumps.

MR. MARK: Will there be a presentation from the staff in which we can ask them why they disallow natural circulation?

MR. EBERSOLE: Among other things they disallow.

MR. LIPINSKI: As part of your normal ascension testing then, will you have any fast recorders to show what the flux variations are as a function of time. Your normal plant recorders will not tell you what's happening to that core.

MR. MARTIN: We have a very sophisticated transient data acquisition system that is capable of recording that information. I'd like to defer that to Chris Powers, if we may, in the interest of the lateness of the hour.

MR. LIPINSKI: Okay, but one final question. You will do this from 100 percent power with the recirc pump trip coasting down.

MR. MARTIN: We do a combination of trips, one pump trips, two pump trips, and we have ---

MR. LIPINSKI: But the worst case is 100 percent power and all the pumps tripped.

MR. MARTIN: Both recirc pumps tripped?

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MR. LIPINSKI: No, all -- yes, both recirc pumps tripped.

MR. MARTIN: Chris, are you in the audience? I would like to introduce Chris Powers and let him answer because, again, we do demonstrate that while he's walking up here on different combinations.

MR. POWERS: My name is Chris Powers and I am the reactor engineering supervisor for unit two. I have direct technical responsibility for the power ascension test program which we will conduct from fueling through declaration of commercial operation.

To specifically address your question, we have a special test exception contained within our technical specifications that allows us to maneuver the plant into the natural circulation mode at the top left corner of power flow map which is the bottom of the 100 percent load line. And we demonstrate our margins to core stability criteria at that point.

MR. LIPINSKI: Let me ask the question again because the way you've answered it, I'm not sure that I got the answer to the question.

From 100 percent power, you trip both recirc pumps and let the power coast down.

MR. POWERS: Yes.

MR. LIPINSKI: Thank you.

MR. PLESSET: You will do that.

MR. POWERS: That is correct.

MR. PLESSET: Does your boss know you are going to do that?

MR. EBERSOLE: And what do you expect the power level to be when you do that?

MR. POWERS: We expect the power level to drop to approximately 45 percent, 47 percent.

MR. EBERSOLE: And you expect it to be stable?

MR. POWERS: Yes, we do.

MR. EBERSOLE: And that's been analytically predicted.

MR. POWERS: Very definitely so.

MR. EBERSOLE: Has it been proven in other plants yet?

MR. POWERS: Other plants have operated at the natural circulation condition at the low end of the 100 percent loadline which is the power level we would go to should we experience the two pump trip from 100 percent power.

I can state unequivocally that the -- for our unit, our analysis shows that we have stability in that regime.

MR. PLESSET: I think we should pursue this tomorrow maybe.

MR. EBERSOLE: I thought it was more nearly 30, but I ---

MR. LIPINSKI: GE was quoting numbers 20 to 30 depending on ---

MR. MARTIN: It's a standard power ascension program.

It's test condition four. Test condition four envelopes that power level.

MR. PLESSET: I think we'd better retire this. You are having a presentation tomorrow?

MR. POWERS: Not on that particular issue, but I will be up at the podium tomorrow.

MR. PLESSET: Okay.

MR. POWERS: I'd be glad to address any questions that I can.

MR. PLESSET: You might talk to Donald Lipinski a few minutes after we're adjourned for the evening and see if -- what he has in mind.

MR. POWERS: I will try to be prepared.

MR. PLESSET: Okay. Thank you. We appreciate that. Well, we've got a lot of interesting things coming up for tomorrow also, it's clear.

Mr. Bibb, Mr. Mazur, I want to thank you too for your obviously very well prepared presentations and we look forward to your improving even farther for the point of bravity.

So let's adjourn then until tomorrow morning at 8:30.

(Whereupon, at 5:47 p.m. the hearing was adjourned, to reconvene at 8:30 a.m., Friday, September 3, 1982.)

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NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

in the matter of: Washington Public Power Supply System, Unit Two

Date of Proceeding: September 2, 1982

Docket Number: Open Meeting

Place of Proceeding: Richland, Washington

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Margaret Miller

Official Reporter (Typed)

Margaret Miller

Official Reporter (Signature)

SUMMARY OF LICENSING STATUS
WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2

AUGUST 1971	APPLICATION TO CONSTRUCT, NO. 2
SEPTEMBER 1972	CP-SER ISSUED
MARCH 1973	CONSTRUCTION PERMIT ISSUED (CPPR-93)
MARCH 1977	APPLICATION FOR OPERATING LICENSE TENDERED
DECEMBER 1981	OL-FES ISSUED
MARCH 1982	OL-SER ISSUED
AUGUST 1982	OL-SSER NO. 1 ISSUED
SEPTEMBER 1983	APPLICANT'S ESTIMATED FUEL LOAD DATE

COMPARISON WITH OTHER PLANTS

FEATURE	WNP-2	LA SALLE	ZIMMER
TYPE REACTOR	BWR/5	BWR/5	BWR/5
CONTAINMENT	MARK II *	MARK II	MARK II
RATED THERMAL POWER, MW	3323	3293	2436
GROSS ELECTRICAL OUTPUT, MW	1150	1122	883
FUEL LATTICE	8X8	8X8	8X8
NUMBER OF FUEL ASSEMBLIES	764	764	560
FUEL RODS - PER ASSEMBLY	6~~3~~ 2	62	63
NUMBER OF CONTROL RODS	185	185	137
REACTOR VESSEL INSIDE DIAMETER,	251	251	218
REACTOR VESSEL DESIGN PRESSURE (PSIG)	1250	1250	1250
SYSTEM PRESSURE (PISA)	1020	1020	1020

*FREE-STANDING STEEL CONTAINMENT

RESOLVED OUTSTANDING ISSUES

(1) GEOLOGY AND SEISMOLOGY

(5) COMPONENT SUPPORTS

(7) CONDENSATION OSCILLATION AND CHUGGING LOAD SPECS

(11) ENGINEERED SAFETY FEATURE RESET CONTROL

(12) REMOTE SHUTDOWN SYSTEM I&C DESIGN

(14) ADEQUACY OF STATION ELECTRIC DISTRIBUTION SYSTEM

(15) QUALITY GROUP CLASSIFICATION FOR THE DG AUXILIARY SYSTEMS

(16) DIESEL ENGINE COOLING HEATER PREHEAT

(17) DIESEL ENGINE LUBE OIL SYSTEM'S ABILITY PRECLUDE DRY STARTING

(18) BLOCKAGE OF THE DG COMBUSTION AIR INTAKE AND EXHAUST SYSTEM

(19) SHIFT SUPPORT SUPERVISOR TRAINING PROGRAM

(20) ADMINISTRATIVE PROCEDURES: LIMITATION ON WORKING HOURS

(25) GENERAL DESIGN CRITERION (GDC) 51

(27) TMI II.K.3.28, QUALIFICATION OF ACCUMULATORS ON ADS VALVES

REMAINING OUTSTANDING ISSUES

(2) INTERNALLY GENERATED MISSILES

(3) TORNADO MISSILE PROTECTION FOR DIESEL GENERATOR (DG) EXHAUST

(4) TURBINE MISSILES

(6) EQUIPMENT QUALIFICATION

(8) PRESSURE INTERLOCKS ON ECCS INJECTION VALVES

(9) MODIFICATION OF ADS LOGIC

(10) STANDBY SERVICE WATER SYSTEM I&C DESIGN

(13) CONTROL SYSTEM FAILURES

(21) CRITERIA FOR TESTING HOT PIPE CONTAINMENT PENETRATIONS

(22) EMERGENCY PLANNING PROGRAM

(23) CONTROL ROOM DESIGN REVIEW

(24) ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)

(26) TMI II.E.4.2 (OPERABILITY OF PURGE VALVES ONLY)

(28) PIPE BREAK IN THE BWR SCRAM DISCHARGE

(29) STEAM BYPASS FROM A STUCK OPEN WETWELL-TO-DRYWELL VACUUM BREAKER

(30) HEAVY LOAD HANDLING SYSTEM

(31) SPRINKLER AND STANDPIPE SYSTEM

1. GEOLOGY AND SEISMOLOGY (SSER 2.5)

AFTER REVIEWING ALL THE INFORMATION AVAILABLE AT THIS TIME, THE STAFF HAS NO BASIS FOR ALTERING THE CONCLUSIONS IN THE CP-SER FOR WNP-2, THAT THERE ARE NO CAPABLE FAULTS WITHIN FIVE MILES OF THE SITE, AND THE GROUND MOTION VALUES OF 0.25G AND 0.125G USED AS THE ZERO PERIOD LIMIT OF APPROPRIATE RESPONSE SPECTRA FOR SSE AND OBE ARE ADEQUATELY CONSERVATIVE.

STATUS: RESOLVED

2. <u>INTERNALLY GENERATED MISSILES</u> (SER 3.5.1.1, 3.5.1.2)

THE APPLICANT'S SCHEDULED COMPLETION DATE FOR THE REPORT IS OCTOBER 1982.

<u>STATUS</u>: AWAITING FURTHER INFORMATION

3. <u>TORNADO MISSILE PROTECTION FOR DIESEL GENERATOR EXHAUST</u>
(SER 3.5.2, 9.5.8)

THE STAFF IS PROPOSING TWO ALTERNATIVE METHODS OF PROVIDING TORNADO MISSILE PROTECTION, NAMELY, 1) HAVE CONTROL OF THE BLUFF AREA AND COMMIT TO HAVING NO LOOSE MATERIALS INCLUDING UTILITY POLES STORED THERE DURING THE LIFE OF THE FACILITY.

THE APPLICANT BELIEVES THAT THE PROBABILITY OF A TORNADO OF SUFFICIENT VELOCITY TO LIFT LARGE, HEAVY MISSILES ALMOST 1000 FEET AWAY AND PLUG THE DIESEL EXHAUSTS IS EXTREMELY LOW AND THUS ADDITIONAL PROTECTION OR ADMINISTRATIVE CONTROLS ARE UNNECESSARY.

THE STAFF WILL BE MEETING WITH THE APPLICANT IN THE NEAR FUTURE.

<u>STATUS</u>: UNDER REVIEW

4. <u>TURBINE MISSILES</u> (SER 3.5.1.3)

THE WNP-2 HAS A WESTINGHOUSE TURBINE GENERATOR AND ITS PLACEMENT AND ORIENTATION IS UNFAVORABLE WITH RESPECT TO THE REACTOR BUILDING; THAT IS, THERE ARE SAFETY-RELATED TARGETS INSIDE THE LOW TRAJECTORY MISSILE (LTM) STRIKE ZONE.

THE STAFF HAS RECEIVED THE REQUESTED INFORMATION FROM THE APPLICANT.

<u>STATUS</u>: UNDER REVIEW

5. COMPONENT SUPPORTS (SER 3.9.3.3)

THE STAFF IS REVIEWING THE APPLICANT'S RESPONSE TO IE BULLETIN 79-02 WITH RESPECT TO THE PIPE SUPPORT BASEPLATE FLEXIBILITY AND ITS EFFECT ON ANCHOR BOLT LOADS. WITH RESPECT TO BASE PLATE FLEXIBILITY, THE APPLICANT HAS DESCRIBED THE METHOD FOR CALCULATING THE LOADS IN THE BOLTS AS A RESULT OF PLANT FLEXIBILITY FOR VARIOUS PLATE AND BOLT CONFIGURATIONS AND THE STAFF FINDS THIS ACCEPTABLE.

STATUS: RESOLVED

6. ELECTRICAL EQUIPMENT QUALIFICATION (SER 3.10, 3.11)

THE APPLICANT HAS COMMITTED TO SUBMIT THE REMAINING INFORMATION IN THESE AREAS IN SEPTEMBER 1982. ENVIRONMENTAL EQUIPMENT QUALIFICATION AUDIT IS SCHEDULED FOR ACTION 1982 AND SEISMIC QUALIFICATION REVIEW TEAM (SQRT) AUDIT IS SCHEDULED FOR NOVEMBER 1982.

STATUS: AWAITING INFORMATION

7. CONDENSATION - OSCILLATION (CO) AND CHUGGING LOAD SPECIFICATIONS (SSER 6.2)

WNP-2 PLANT DIFFERS FROM OTHER DOMESTIC MARK II PLANTS IN TWO RESPECTS; IT HAS A FREE STANDING STEEL CONTAINMENT (NOT REINFORCED CONCRETE) AND THE SUPPRESSION POOL HAS A SLOPING INSTEAD OF FLAT FLOOR. THE APPLICANT DEVELOPED A PLANT - UNIQUE CHUGGING SPECIFICATION FOR WNP-2 WHICH IS MORE CONSERVATIVE THAN THE GENERIC SPECIFICATION. THE APPLICANT HAS PRESENTED ARGUMENTS THAT CO LOADS ARE NOT THE GOVERNING LOADS FOR WNP-2 AND A SEPARATE ANALYSIS FOR RESPONSE TO CO LOADS IS NOT NECESSARY

STATUS: RESOLVED

8. PRESSURE INTERLOCKS ON EMERGENCY CORE COOLING INJECTION VALVES (SER 6.3.2.3)

THE CURRENT DESIGN OF LOW PRESSURE ECCS PROVIDES OVERPRESSURIZATION PROTECTION FROM REACTOR VERSEL THROUGH THE USE OF TESTABLE CHECK VALVE FOLLOWED BY NORMALLY CLOSED MO INJECTION VALVES. THE DESIGN PREVENTS INJECTION VALVE OPENING WHEN ΔP ACROSS THE VALVE EXCEEDS APPROXIMATELY 750PSID.

THE STAFF'S POSITION IS THAT THIS INTERLOCK BE PRESENT AT ALL TIMES FOR BOTH AUTOMATIC AND MANUAL VALVE ACTUATION, AND THAT THE SETPOINTS BE SUCH THAT THE VALVE CANNOT BE OPENED UNTIL REACTOR COOLANT PRESSURE IS BELOW THAT OF THE LOW PRESSURE ECCS INVOLVED.

THE APPLICANT HAS AGREED TO MAKE THIS MODIFICATION, BUT NOT UNTIL FIRST REFUELING OUTAGE

STATUS: JUSTIFICATION FOR DELAY UNDER REVIEW

9. <u>MODIFICATIONS OF AUTOMATIC DEPRESSURIZATION SYSTEM (ADS)</u> LOGIC (II.K.3.18, SER 6.3.6)

THE APPLICANT HAS TAKEN TO POSITION THAT THE CURRENT ADS LOGIC DESIGN, WITH IMPLEMENTATION OF THE SYMPTOM - ORIENTED EMERGENCY PROCEDURES GUIDELINES (EPG'S), IS ADEQUATE. THE STAFF'S POSITION IS THAT THE APPLICANT PROVIDE LOGIC MODIFICATIONS THAT ELIMINATE THE NEED FOR OPERATOR ACTION TO DEPRESSURIZE THE VESSEL FOR THE CASE OF A STUCK OPEN SAFETY RELIEF VALVE OR OUTSIDE STEAMLINE BREAK (WITH FAILURE OF HPCS)

<u>STATUS</u>: AWAITING FURTHER INFORMATION

10. <u>STANDBY SERVICE WATER SYSTEM INSTRUMENTATION AND CONTROL</u> (I&C) DESIGN (SER 7.3.2.4)

THE STANDBY SERVICE WATER SYSTEM IS CONTROLLED USING MULTIPLEXED SIGNALS TO OPERATE ASSOCIATED PUMPS AND VALVES. THE SYSTEM IS REDUNDANT (ONE CHANNEL PER ESF DIVISION), POWERED FROM CLASS IE POWER SOURCES, AND IS SEISMICALLY QUALIFIED.

THE STAFF IS REVIEWING AND DISCUSSING THE UNIQUE FAILURE MODES SUCH AS AN ELECTROMAGNETIC INTERFERENCE, TESTABILITY, AND SURVEILLANCE WITH THE APPLICANT.

<u>STATUS</u>: UNDER REVIEW

11. ENGINEERING SAFETY FEATURES RESET CONTROL - IE 80-06)
(SSER D.3.2.7)

IN THE SER, THE STAFF STATED THAT A FULL RESPONSE TO IE BULLETIN 80-06, WAS REQUIRED AND THAT CORRECTIVE ACTIONS, IF NEEDED, WERE TO BE COMPLETED PRIOR TO FUEL LOAD. THE APPLICANT HAS COMMITTED TO MODIFY EQUIPMENT PRIOR TO FUEL LOAD, AND ALSO HAS COMMITTED TO PREOPERATIONAL TESTING TO VERIFY THAT ALL EQUIPMENT REMAINS IN ITS EMERGENCY MODE UPON REMOVAL OF THE ACTUATING SIGNAL AND/OR RESET.

STATUS: RESOLVED

12. REMOTE SHUTDOWN SYSTEM I&C DESIGN (SSER 7.4.2.3)

THE STAFF'S CONCERN WAS THAT THE REMOTE SHUTDOWN CAPABILITY DESCRIBED IN THE FSAR MIGHT NOT MEET THE QUALITY AND REDUNDANCY STANDARDS NEEDED TO CONFORM TO GDC 19.

THE APPLICANT HAS AGREED TO INSTALL AN ALTERNATE SHUTDOWN SYSTEM LOCATED ABOUT 300 FT. FROM THE REMOTE SHUTDOWN SYSTEM. THIS WILL BE INSTALLED DURING FIRST REFUELING OUTAGE. THIS WILL BE MADE A CONDITION OF THE LICENSE.

STATUS: RESOLVED

13. <u>CONTROL SYSTEM FAILURES</u> (SER 7.7.2.1, 7.7.2.2, 7.7.2.3)

THE MAJOR CONCERN HERE IS THAT IF TWO OR MORE CONTROL SYSTEMS RECEIVE POWER OR SENSOR INFORMATION FROM COMMON POWER SOURCES OR COMMON SENSORS, FAILURES OF THESE POWER SOURCES OR SENSORS OR RUPTURE/PLUGGING OF A COMMON IMPULSE LINE COULD RESULT IN EVENT SEQUENCES MORE SEVERE THAN THOSE CONSIDERED IN THE PLANT SAFETY ANALYSIS.

THE APPLICANT HAS COMMITTED TO PERFORM A STUDY TO DETERMINE CONTROL SYSTEMS FAILURES WHICH COULD RESULT IN PHENOMENA WHICH COULD INTITIATE OR WORSEN A TRANSIENT/ACCIDENT.

THE RESULTS OF THE STUDY WILL BE PROVIDED IN DECEMBER 1982 AND, IF NEEDED, REMEDIAL ACTIONS WILL BE IMPLEMENTED PRIOR TO PLANT OPERATION.

<u>STATUS</u>: AWAITING INFORMATION

14. ADEQUACY OF STATION ELECTRIC DISTRIBUTION SYSTEM VOLTAGES (SER 8.4.4)

EXPERIENCE HAS SHOWN THAT ADVERSE EFFECTS ON THE CLASS IE LOADS CAN BE CAUSED BY SUSTAINED LOW GRID VOLTAGE CONDITIONS WHEN CLASS IE BUSES ARE CONNECTED TO OFFSITE POWER. THESE LOW VOLTAGE CONDITIONS WILL NOT BE DETECTED BY THE LOSS OF VOLTAGE RELAYS (LOSS TO OFFSITE POWER) WHOSE LOW VOLTAGE PICKUP SETTING IS GENERALLY IN THE RANGE OF 0.7 PER UNIT VOLTAGE OR LESS.

THE APPLICANT HAS ADDRESSED THIS PROBLEM AND WNP-2 DESIGN IS IN CONFORMANCE WITH PSB BTP-1. ITEM IS RESOLVED PENDING DOCUMENTATION IN THE FSAR AND SUBMITTAL OF THE DRAWINGS.

STATUS: RESOLVED

15. QUALITY GROUP CLASSIFICATION FOR THE DG AUXILIARY SYSTEMS (SSER 9.5.4)

THE FUEL OIL TRANSFER SYSTEM PIPING AND COMPONENTS BETWEEN THE ENGINE INTERFACE AND THE ENGINE AUXILIARY SKID INTERFACE ARE DESIGNED SEISMIC CATEGORY I. THE PIPING IS DESIGNED TO ANSI B31.1 AND IS QUALITY GROUP D.

THE STAFF POSITION IS THAT PIPING COMPONENTS BE DESIGNED TO SATISFY ASME SECTION III CLASS 3 (QUALITY GROUP C) REQUIREMENTS. TO MEET THIS, THE STAFF WILL REQUIRE THAT ALL DIESEL ENGINE AUXILIARY SYSTEM PIPING BE HYDROSTATICALLY TESTED TO A MINIMUM OF 125% OF DESIGN PRESSURE. THE STAFF WILL VERIFY THESE TESTS PRIOR TO LICENSING.

STATUS: RESOLVED

16. <u>DIESEL ENGINE COOLING HEATER PREHEAT</u> (SER 9.5.5)

THE STAFF'S CONCERN WAS IF THE DIESEL GENERATOR ROOM HVAC SYSTEM FAILED, THE ROOM TEMPERATURE MAY APPROACH BELOW FREEZING LEVEL. IMPROPER PREHEATING OF THE DIESEL ENGINE UNITS MAY PREVENT PERFORMANCE OF THEIR REQUIRED SAFETY FUNCTION AND MAY DEGRADE AVAILABILITY OF DIESEL GENERATOR TO AN UNACCEPTABLE LEVEL. THE STAFF REQUIRES THAT ALARMS BE INSTALLED SO THAT, IF THE ROOM TEMPERATURE DROPS BELOW THE CONTROLLED TEMPERATURE LEVEL, THE DROP WOULD BE ALARMED IN THE MAIN CONTROL ROOM. THE APPLICANT HAS COMMITTED TO PROVIDE THE ALARMS.

<u>STATUS</u>: RESOLVED

17. DIESEL ENGINE LUBE OIL SYSTEMS ABILITY PRECLUDE DRY STARTUP (SSER 9.5.7)

THE PREHEAT LUBRICATION SYSTEM FOR THE DIESEL ENGINE IS COMPOSED OF A CONTINUOUSLY OPERATING AC PUMP AND A STANDBY DC PUMP THAT PRELUBRICATES THE TURBOCHARGER BEARINGS ONLY. THE OTHER WEARING PARTS OF THE ENGINE DO NOT RECEIVE ANY LUBRICATION UNTIL AFTER THE ENGINE STARTS AND THE ENGINE-DRIVEN LUBE OIL PUMPS REACH FULL SPEED. THE STAFF REQUIRED A PRELUBRICATION OF THE DIESEL ENGINES BECAUSE DRY STARTING OF THE DIESEL ENGINES UNDER EMERGENCY CONDITIONS WILL RESULT IN MOMENTARY LACK OF LUBRICATION AT THE VARIOUS MOVING PARTS.

THE MANUFACTURER'S RECOMMENDATION WOULD NOT TOTALLY ALLEVIATE THE PROBLEM OF DRY STARTUP OF THE ENGINE, IN THAT ONLY THE WEARING PARTS LOCATED IN THE LOWER HALF OF THE ENGINE ARE LUBRICATED. THE APPLICANT NOW HAS AGREED TO MANUALLY PRELUBRICATE THE DIESEL ENGINES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS ATLEAST ONCE A WEEK AND BEFORE EACH MANUAL DIESEL ENGINE START.

STATUS: RESOLVED

18. <u>BLOCKAGE OF THE DG COMBUSTION AIR INTAKE AND EXHAUST SYSTEM</u> (SER 9.5.8)

THE STAFF'S CONCERN WAS THAT THE APPLICANT HAS NOT ADEQUATELY ADDRESSED POTENTIAL BLOCKAGE OF THE COMBUSTION INTAKE STRUCTURE DUE TO THE DESIGN WORST CASE DUST STORM AND BLOCKAGE OF THE DIESEL ENGINE EXHAUST STACK DUE TO SEVERE METEOROLOGICAL EVENTS SUCH AS FREEZING RAIN, SNOW, DUST STORM, AND HEAVY RAIN.

THE APPLICANT HAS PROVIDED ADDITIONAL INFORMATION WHICH SATISFIES STAFF'S CONCERN.

<u>STATUS</u>: RESOLVED

19. SHIFT SUPPORT SUPERVISOR TRAINING PROGRAM (SSER 13.2.2.5)

THE SHIFT SUPPORT SUPERVISOR WILL RECEIVE IN ADDITION TO GENERAL EMPLOYEE TRAINING, THE SPECIFIC SYSTEMS AND PROCEDURES TRAINING BEFORE FUEL LOAD.

STATUS: RESOLVED

20. ADMINISTRATIVE PROCEDURES: LIMITATION ON WORKING HOURS (SER 13.5.1.4)

THE STAFF'S POSITION WAS THAT THE OVERTIME LIMITATIONS ON WORKING HOURS BE EXPANDED TO INCLUDE OTHER PERSONNEL PERFORMING SAFETY-RELATED FUNCTIONS SUCH AS HEALTH PHYSICISTS AND KEY MAINTENANCE PERSONNEL, AND DEVIATIONS FROM THE GUIDELINES BE AUTHORIZED BY THE PLANT MANAGER OR HIS DEPUTY, OR HIGHER LEVELS OF MANAGEMENT.

STATUS: RESOLVED

21. <u>CRITERIA FOR TESTING HOT PIPE CONTAINMENT PENETRATIONS</u>

THE APPLICANT HAS RECENTLY STATED THAT UNLIKE OTHER MARK II PLANTS IT HAS A FREE STANDING STEEL CONTAINMENT AND THE ABOVE CRITERIA FOR TESTING OF HOT PIPE CONTAINMENT PENETRATIONS IS NOT APPLICABLE TO WNP-2.

THE STAFF IS DISCUSSING THIS WITH THE APPLICANT & WILL RESPORT THE RESOLUTION IN LATER SSER.

<u>STATUS</u>: UNDER REVIEW

22. <u>EMERGENCY PLANNING PROGRAM</u> (SER 13.3)

THE APPLICANT HAS FILED EMERGENCY PLANNING PROGRAM FOR WNP-2 ONSITE AND CORPORATE ACTIVITIES ONLY. OFFSITE STATE AND LOCAL ENTITIES WITHIN THE EMERGENCY PLANNING ZONES HAVE NOT SUBMITTED THEIR PLAN.

<u>STATUS</u>: AWAITING FURTHER INFORMATION

23. <u>CONTROL ROOM DESIGN REVIEW</u> (SER 18.0)

THE APPLICANT PROPOSES TO SUBMIT THE CONTROL ROOM DESIGN REVIEW REPORT BY MARCH 1983. THE STAFF WILL REPORT THE RESULTS OF THE EVALUATION IN A FUTURE SUPPLEMENT.

<u>STATUS</u>: AWAITING FURTHER INFORMATION

24. <u>ANTICIPATED TRANSIENTS WITHOUT SCRAM</u> (ATWS) (SER 15.2.1)

THE STAFF PRESENTED ITS RECOMMENDATION ON PLANT MODIFICATIONS TO THE COMMISSION IN SEPTEMBER 1980. THE COMMISSION WILL DETERMINE THE REQUIRED MODIFICATIONS TO RESOLVE ATWS CONCERNS AS WELL AS THE REQUIRED SCHEDULE FOR IMPLEMENTATION OF SUCH MODIFICATIONS.

FOR THE INTERIM PERIOD, STAFF REQUIRES THAT EMERGENCY PROCEDURES BE DEVELOPED FOR AN ATWS EVENT. APPLICANT WILL PROVIDE INFORMATION ON EMERGENCY PROCEDURES IN MARCH 1983.

<u>STATUS</u>: AWAITING INFORMATION

25. <u>GENERAL DESIGN CRITERION (GDC)51, (FRACTURE PREVENTION OF CONTAINMENT PRESSURE BOUNDARY)</u> (SSER G.2.7)

THE STAFF HAS COMPLETED THE REVIEW OF THE APPLICANT'S SUBMITTAL AND CONCLUDES THAT THE FERITIC MATERIALS IN THE WNP-2 CONTAINMENT PRESSURE BOUNDARY MEET THE FRACTURE TOUGHNESS REQUIREMENTS THAT ARE SPECIFIED FOR CLASS 2 COMPONENTS BY THE 1977 ADDENDA OF SECTION III OF THE ASME CODE. THE REQUIREMENTS OF GDC 51 ARE SATISFIED.

<u>STATUS</u>: RESOLVED

26. <u>TMI ITEM II.F.4.2, CONTAINMENT ISOLATION DEPENDABILITY (OPERABILITY OF PURGE VALVES ONLY - SER 6.2.4.4)</u>

THE STAFF REQUIRES THAT THE PERFORMANCE AND RELIABILITY OF PURGE SYSTEM ISOLATION VALVES SHOULD BE DEMONSTRATED UNDER CONDITIONS SIMILAR TO THOSE EXISTING IN THE CONTAINMENT FOLLOWING ONSET OF A LOCA.

THE APPLICANT HAS NOT SUBMITTED INFORMATION CONCERNING PURGE VALVE OPERABILITY UNDER LOCA LOADS. SUBMITTAL IS EXPECTED IN OCTOBER 1982.

<u>STATUS</u>: AWAITING FURTHER INFORMATION

27. TMI ITEM II.K.3.2.8, QUALIFICATION OF ACCUMATORS ON ADS VALVES (SER 6.3.6)

THE ADS BACKUP AIR SUPPLY SYSTEM HAS BEEN DESIGNED FOR SUFFICIENT INVENTORY TO CYCLE THE ADS VALVES IN THE EVENT THEY ARE REQUIRED TO OPERATE. THE BACKUP SUPPLY BOTTLE BANKS WILL HAVE DAILY SURVEILLANCE TO ASSURE THE BOTTLES ARE NOT LEAKING AND LOSING NITROGEN PRESSURE. IN ADDITION TO THE DAILY SURVEILLANCE OF THE SYSTEM THE FOLLOWING SURVEILLANCE REQUIREMENTS SHOULD BE PERFORMED IN ORDER TO VERIFY THE BOTTLE BANK SYSTEM WILL BE ACTUATED IN THE EVENT OF A LOSS OF THE NORMAL AIR SUPPLY. THIS SURVEILLANCE REQUIREMENT WILL BE INCORPORATED INTHE PLANT TECHNICAL SPECIFICATIONS.

EACH ADS AIR SUPPLY SYSTEM SHALL BE DETERMINED OPERABLE (UNLESS REACTOR PRESSURE IS LESS THAN 125 PSIG) BY:

A.) AT LEAST ONCE PER 31 DAYS, PERFORMING A CHANNEL FUNCTIONAL TEST OF THE ACCUMULATOR BACKUP COMPRESSED GAS SYSTEM LOW PRESSURE ALARM SYSTEM.

B.) AT LEAST ONCE PER 18 MONTHS, PERFORMING A CHANNEL CALIBRATION OF THE ACCUMULATOR BACKUP COMPRESSED GAS SYSTEM LOW PRESSURE ALARM SYSTEMS AND VERIFYING AN ALARM SETPOINT OF (135PSIG) + (3 PSIG) ON DECREASING PRESSURE.

c.) AT LEAST ONCE PER 24 HOURS VERIFYING THE PRESSURE IN EACH OF THE BOTTLES ON THE ACCUMULATOR BACKUP COMPRESSED GAS SYSTEM BOTTLE BANK IS PRESSURIZED TO AT LEAST 2200 PSIG.

D.) AT LEASE ONCE PER 18 MONTHS PERFORMING A CALIBRATION OF THE ACCUMULATOR BACKUP COMPRESSED GAS SYSTEM BOTTLE BANK PRESSURE GAGES ON EACH OF THE BOTTLES.

STATUS: RESOLVED

28. PIPE BREAK IN THE BWR SCRAM SYSTEM (SER 4.6)

NUREG-0803, "GENERIC SAFETY EVALUATION REPORT REGARDING INTEGRITY OF BWR SCRAM SYSTEM PIPING", STATES THAT PIPE BREAKS IN THE CONTROL ROD DRIVE HYRAULIC SYSTEM AND THE RESULTING ENVIRONMENTAL EFFECTS SHOULD BE VERIFIED ON A PLANT SPECIFIC BASIS. THE APPLICANT HAS BEEN ASKED TO RESPOND TO THIS CONCERN. RESPONSE EXPECTED OCTOBER 1982.

STATUS: AWAITING FURTHER INFORMATION

29. STEAM BYPASS FROM A STACK OPEN WETWELL-TO-DRYWELL VACUUM BREAKER (SER 6.2.1.8.6)

THIS CONCERN WAS RAISED BY THE ACRS DURING THE APRIL 28-29, 1981, FLUID DYNAMICS SUBCOMMITTEE MEETING. DUE TO THE LARGE ΔP DEVELOPED DURING THE CHUGGING PHENOMENON, THE VACUUM BREAKERS MAY OPEN, AND SINCE THE CHUGGING PHENOMENON IS REPEATED EVERY 2 SECONDS ON THE AVERAGE, THE VACUUM BREAKER MAY BE CALLED UPON TO FUNCTION ON A CYCLIC MANNER. FAILURE OF A VACCUM BREAKER TO CLOSE DURING THIS TIME PERIOD COULD RESULT IN STEAM BYPASS OF THE POOL, THUS JEOPORADIZING THE INTEGRITY OF THE CONTAINMENT. THE APPLICANT HAS INDICATED THAT HE IS PARTICIPATING IN THE VALVE QUALIFICATIONS PROGRAM AND CONSIDERING DESIGN MODIFICATIONS TO RESOLVE THIS CONCERN.

STATUS: AWAITING FURTHER INFORMATION

30. <u>HEAVY LOAD HANDLING SYSTEM</u> (SSER 9.1.5)

NUREG-0612, "CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS," PROVIDES GUIDELINES TO ENSURE SAFE HANDLING OF HEAVY LOADS. THE STAFF ALSO IDENTIFIED A NUMBER OF MEASURES DEALING WITH SAFE LOAD PATHS, PROCEDURES, OPERATOR TRAINING AND CRANE INSPECTIONS, TESTING, AND MAINTENANCE.

THE APPLICANT HAS NOT PROVIDED SUFFICIENT INFORMATION TO DETERMINE COMPLIANCE WITH SOME OF THE CRITERIA IN NUREG-0612. ADDITIONAL RESPONSE EXPECTED OCTOBER 1982.

<u>STATUS</u>: AWAITING FURTHER INFORMATION

31. SPRINKLER AND STANDPIPE SYSTEM (SER 9.5.1.6)

THE WET PIPE SPRINKLER SYSTEM AND STANDPIPE HOSE SYSTEM ARE CONNECTED TO COMMON RISERS FROM THE UNDERGROUND WATER SUPPLY LOOP. TWELVE FIRE AREAS HAVE FIRE LOADING OF LESS THAN 1/2 HOUR (LESS THAN 40,000 BTU/FT^2). SEVEN OF THESE HAVE FIRE LOADINGS WHICH CORROSPOND TO LESS THAN 1/4 HOUR (LESS THAN 20,000 BTU/FT^2), WHICH THE STAFF ACCEPTS THE DELETION OF THE AUTOMATIC SUPPRESSION SYSTEM. THE JUSTIFICATION FOR DELETION OF THE REMAINING FIVE IS UNDER REVIEW.

STATUS: UNDER REVIEW

CONFIRMATORY ISSUES

(1) BREAK LOCATION
(2) PREOPERATIONAL TESTING OF SNUBBERS
(3) REACTOR INTERNALS ANALYSIS UNDER FAULTED CONDITIONS
(4) HYDRODYNAMIC LOADS
(5) CLASS 1 FATIGUE EVALUATIONS FOR THE SAFETY/RELIEF VALVE (SRV) DISCHARGE PIPING AND DOWNCOMERS
(6) METHOD FOR COMBINING DYNAMIC RESPONSES
(7) DESIGN OF COMPONENT SUPPORTS
(8) SYSTEMS DRAWINGS FOR INSERVICE TESTING
(9) FUEL ROD MECHANICAL FRACTURING
(10) FUEL ASSEMBLY STRUCTURAL DAMAGE FROM EXTERNAL SOURCES
(11) FUEL ROD BOWING
(12) OVERHEATING OF GADOLINIA FUEL PELLETS
(13) AUTOMATIC RESTART CAPABILITY FOR REACTOR CORE ISOLATION COOLING (RCIC) SYTEM
(14) MODIFICATION TO PREVENT SPURIOUS ISOLATION OF RCIC SYSTEM
(15) EMERGENCY PROCEDURES REVIEW
(16) ADS, LOW PRESSURE COOLING SYSTEM (LPCS) AND LOW PRESSURE COOLANT INJECTION SETPOINT
(17) RCIC SYSTEM
(18) SRV POSITION INDICATIONS

CONFIRMATORY ISSUES

(19) ADDITIONAL ACCIDENT MONITORING INSTRUMENTATION

(20) ROD BLOCK MONITOR

(21) MITIGATING CORE DAMAGE TRAINING

(22) ASSURANCE OF ESF FUNCTIONING AND SAFETY-RELATED SYSTEM OPERABILITY STATUS

(23) GENERAL PLANT GUIDANCE-BUILIDING DESIGN

(24) DESIGN-BASIS VOLCANIC ASH

LICENSE CONDITIONS

(1) ULTIMATE HEAT SINK

(2) CHANNEL BOX DEFLECTION

(3) EFFECTS OF HIGH-BURNUP FISSION GAS RELEASE ON LOCA ANALYSIS

(4) INADEQUATE CORE COOLING (ICC) INSTRUMENTATION ANALYSIS

(5) CONDITONS FOR OPERATIONS BEYOND CYCLE 1

(6) IE BULLETIN 80-06, "ENGINEERED SAFETY FEATURES RESET CONTROL"

(7) POST-ACCIDENT SAMPLING

(8) RELOCATIONS OF ENGINE-MOUNTED CONTROLS

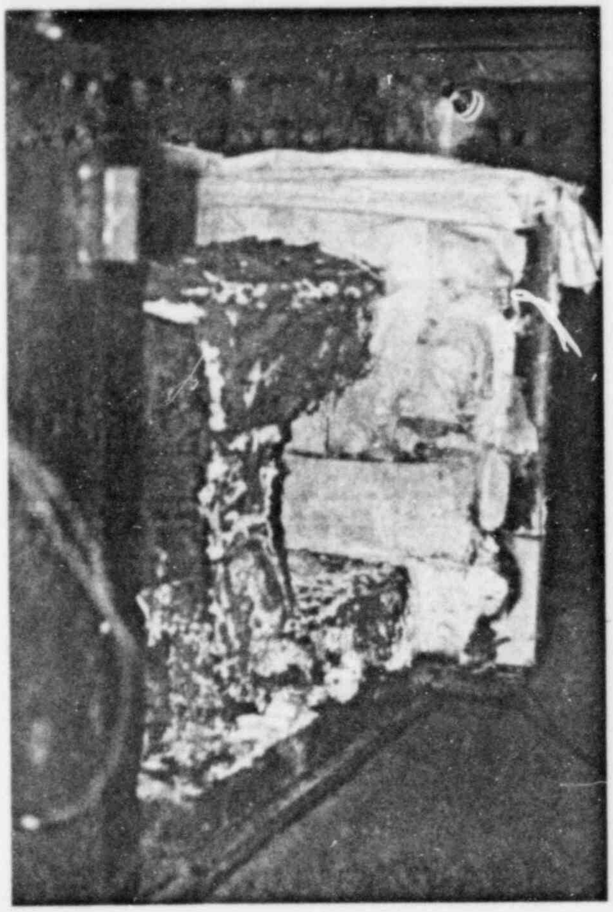
(9) CONFORMANCE OF DIESEL GENERATOR FUEL OIL SYSTEM

(10) BWR STARTUP OR OPERATING EXPERIENCE

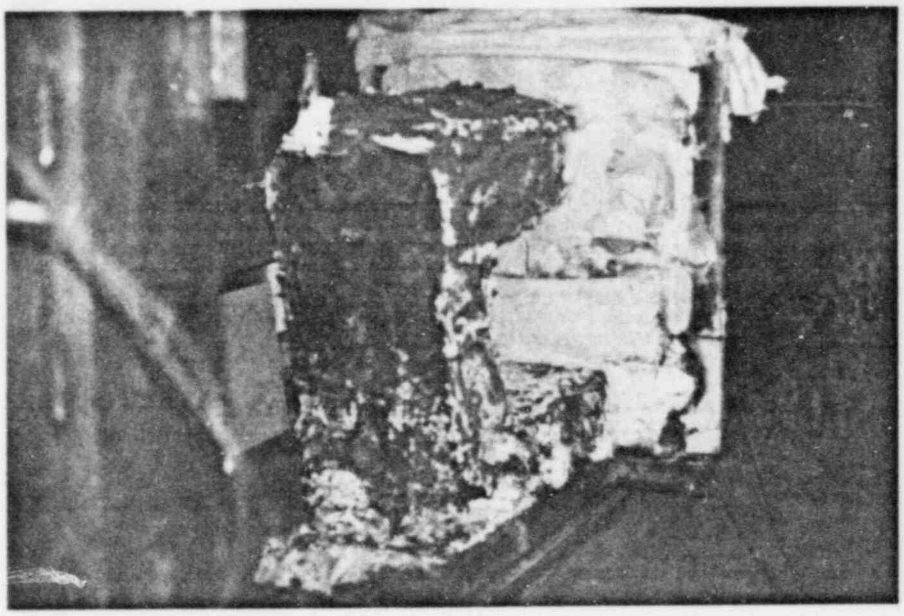
(11) PHYSICAL SECURITY

(12) PROHIBITION OF OPERATIONS WITH PARTIAL FEEDWATER HEATING

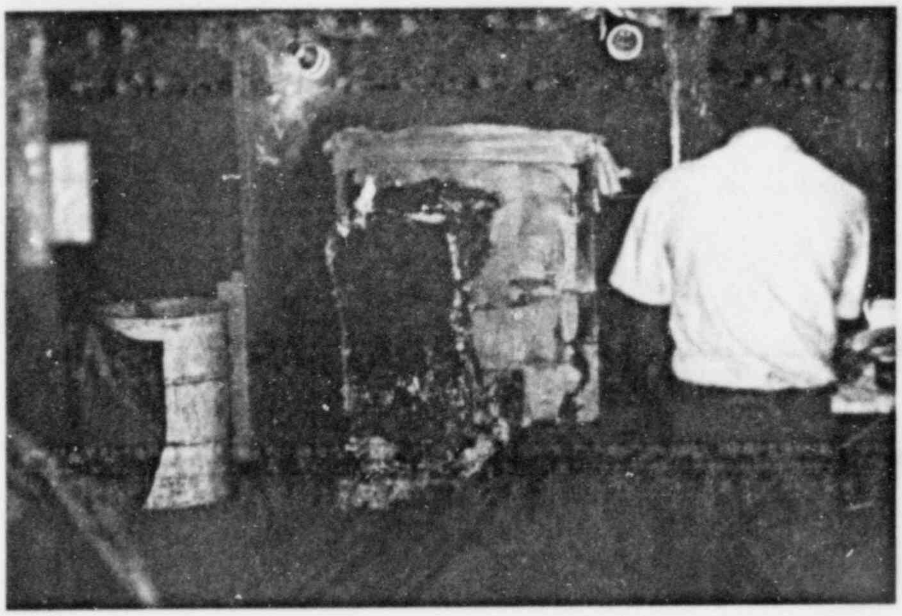
(13) REMOTE SHUTDOWN SYSTEM



Test 6 (Conduit)
Test Article being Removed from Furnace for Hose Test (typical for Tray Tests)

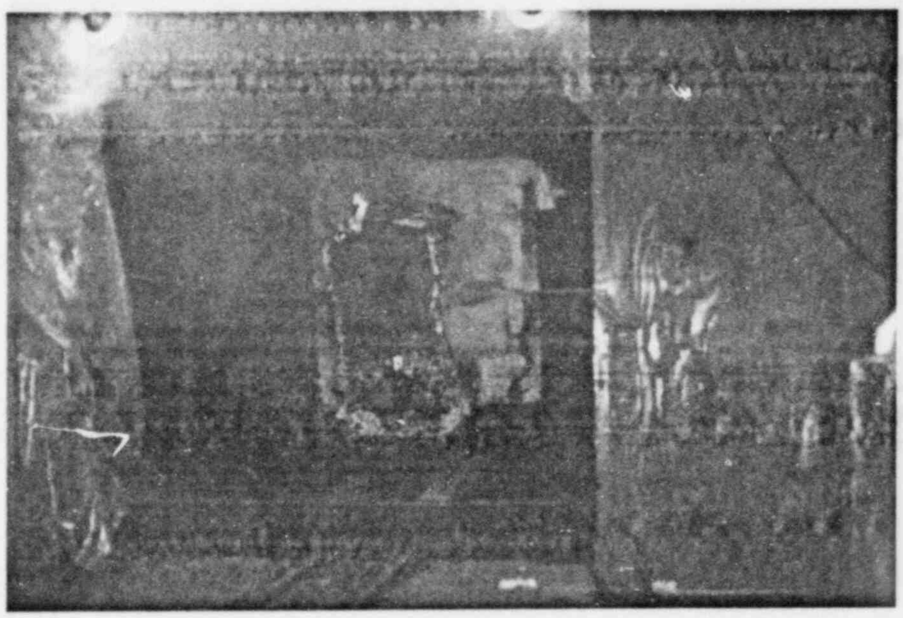


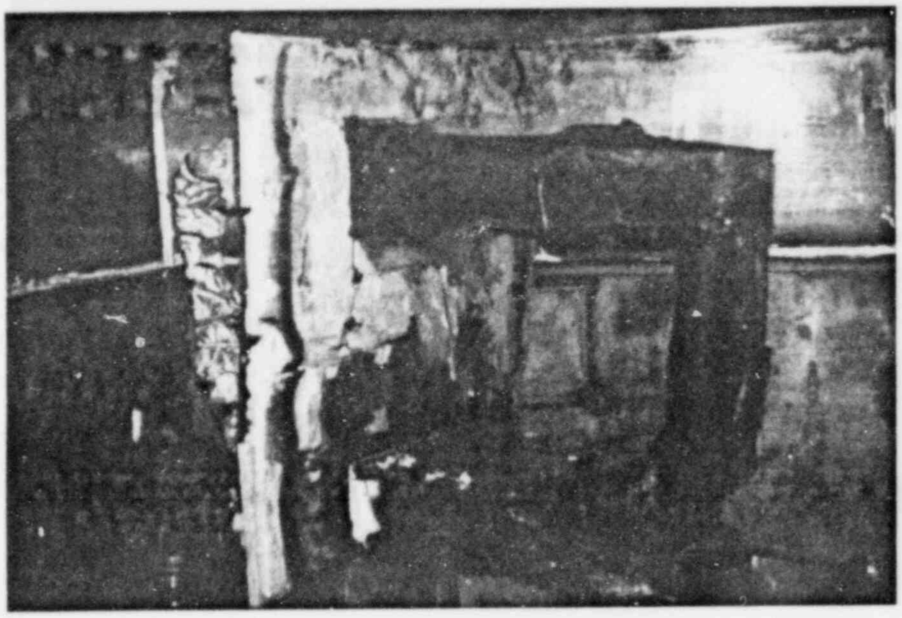
Test 6 (Conduit)
Test Article being Removed from Furnace for Hose Test (typical for Tray Tests)



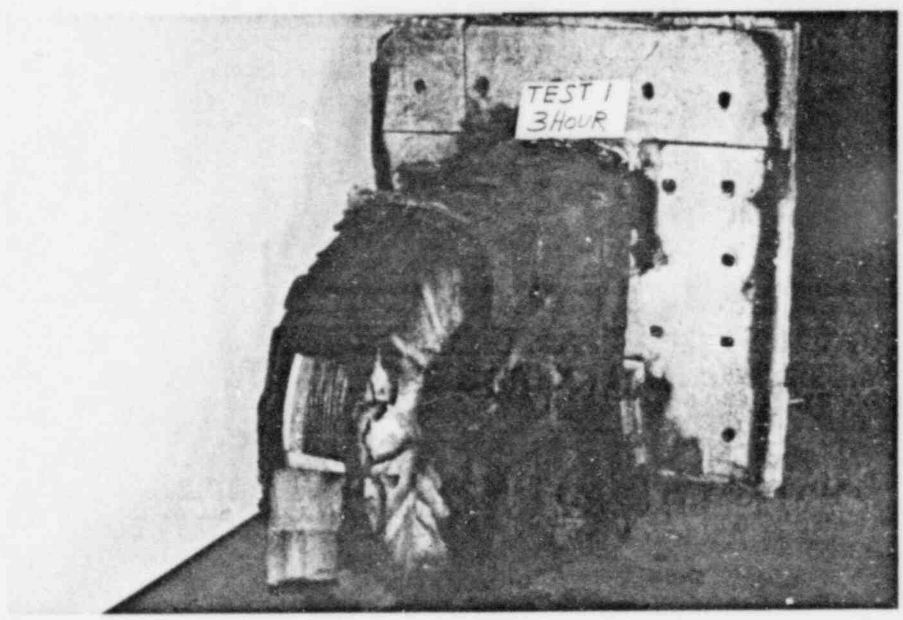
Test 6 (Conduit)
Test Article being Removed from Furnace for Hose Test (Typical for Tray Tests)

Test 6 (Conduit)
Hose Stream Test (typical for Tray Tests)

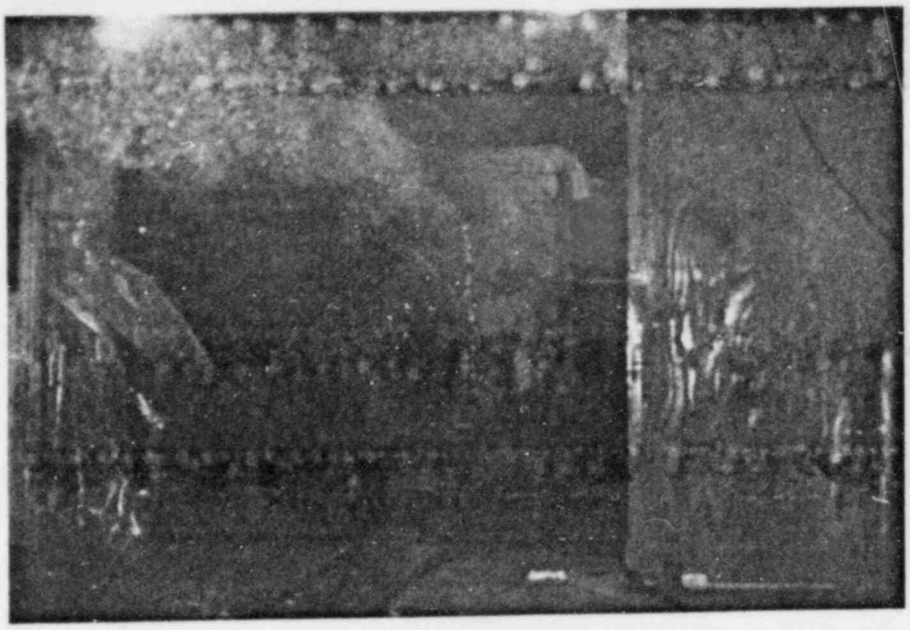




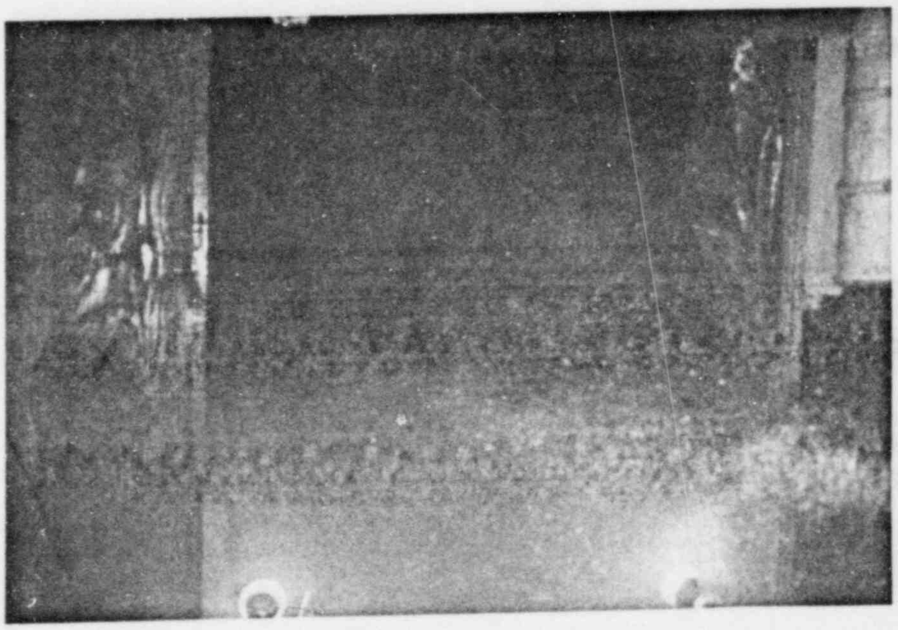
Test 6 (Conduit)
Test Article in Booth
following Hose Stream Test



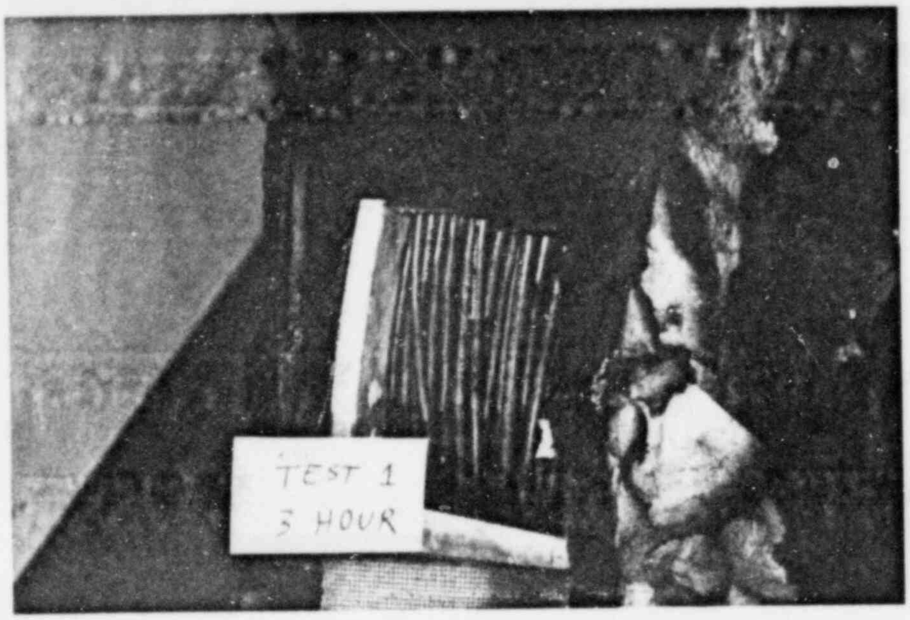
Test 1 (Tray) Showing Cut
Away in End and Repair "Patch"
Removal on Top



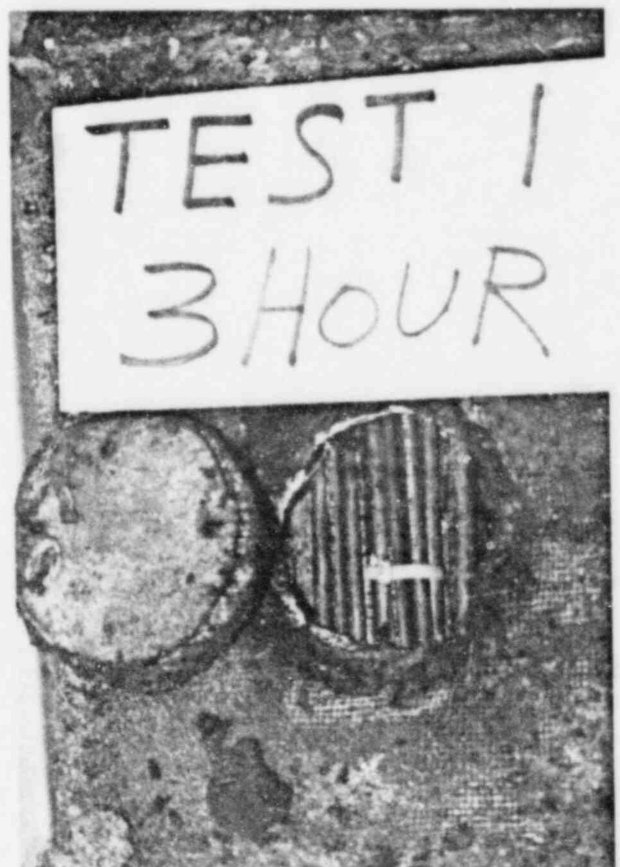
Test 6 (Conduit)
Hose Stream Test (typical for Tray Tests)



Test 6 (Conduit)
Hose Stream Test (typical for Tray Tests)

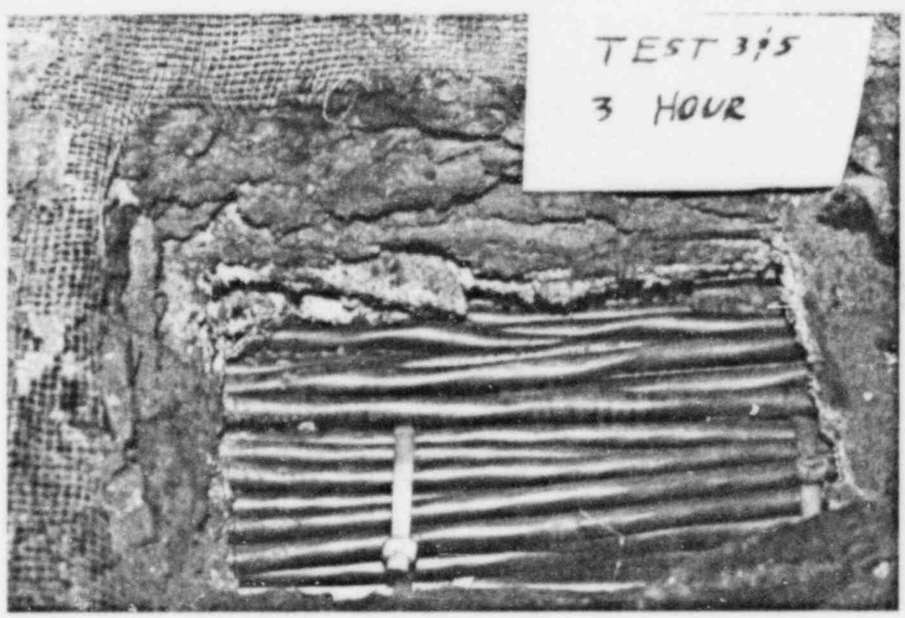


Test 1 (Tray) Showing Close-up of Cut Away in End

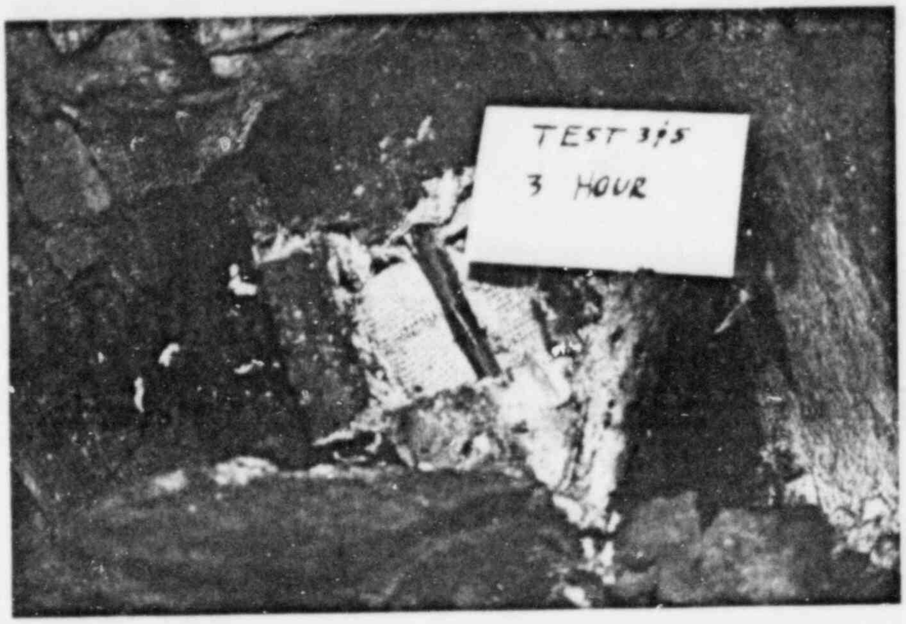


Test 1 (Tray) Showing Removal of Repair "Patch" on Top (Note Undamaged Nylon Cable Tie)

Test 3&5 (Tray and Air Drop Cable) Showing Cut Away in End, Top, and Air Drop Cable

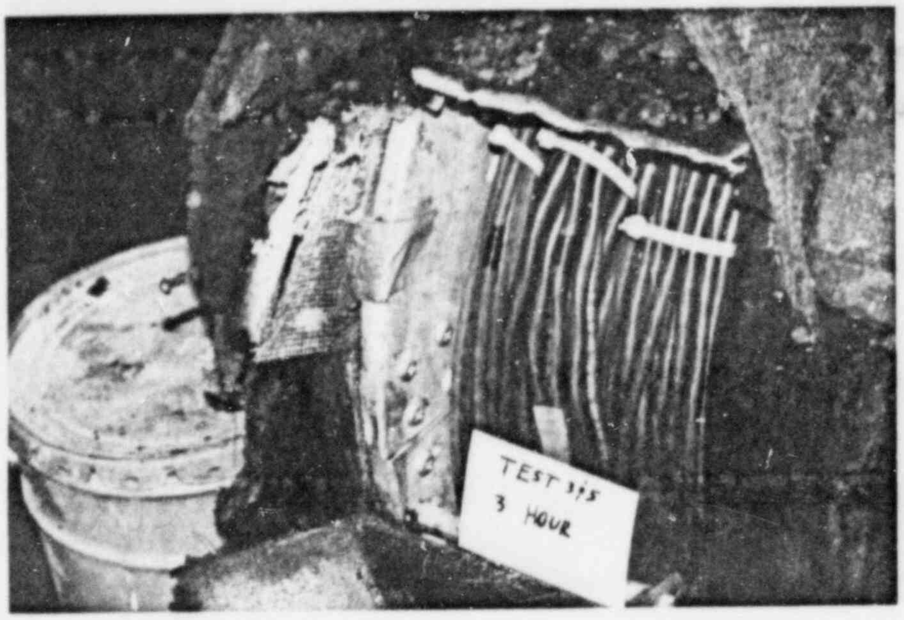


Test 3&5 (Tray and Air Drop Cable) Showing Close-up of Cut Away in Top of Tray (Note Undamaged Cable Ties)

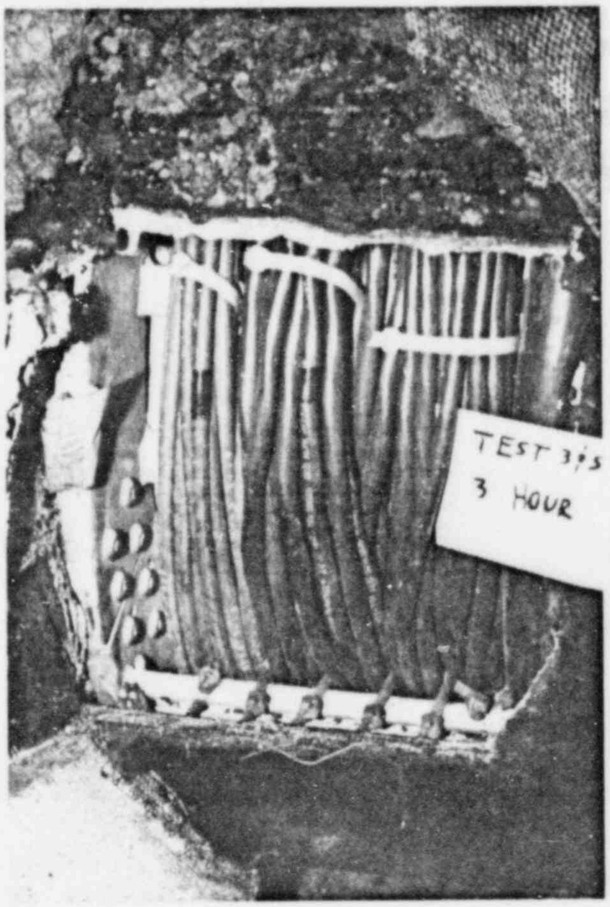


Test 3&5 (Tray and Air Drop Cable) Showing Clos up of Cut Away of Air Dr Cable Envelope (Note Undamaged Electrical Tap Holding Thermocouple Wir in place)

Test 3&5 (Tray and Air Drop Cable) Showing Close-up of Cut Away of Air Drop Cable Envelope (Note Undamaged Electrical Tape Holding Thermocouple Wires in place)



Test 3&5 (Tray and Air Drop Cable) Showing Close-up of Cut Away in End of Tray (Note Undamaged Cable Ties and Masking Tape)

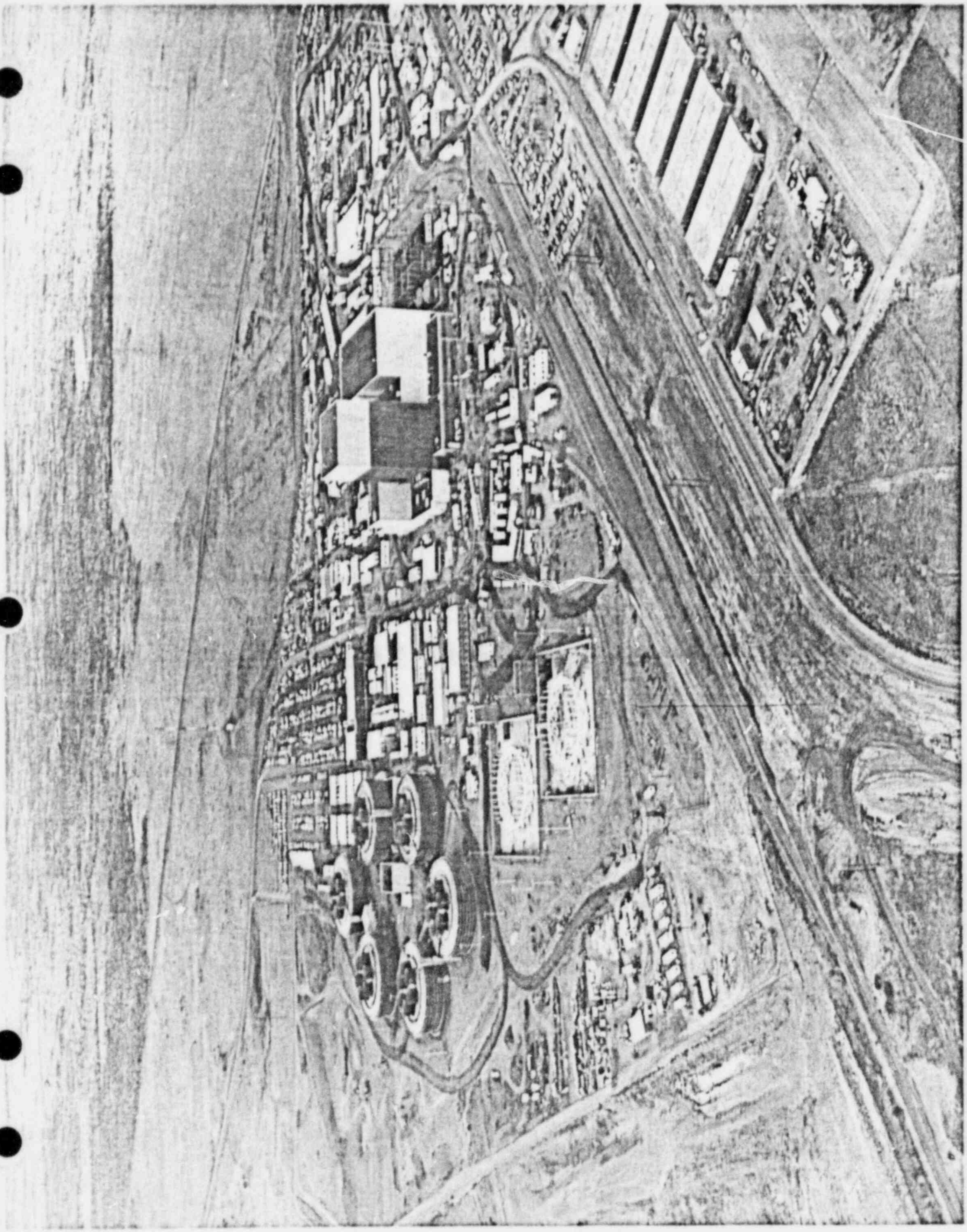


Test 3&5 (Tray and Air Drop Cable) Showing Close-up of Cut Away in End of Tray (Note Undamaged Cable Ties and Masking Tape)

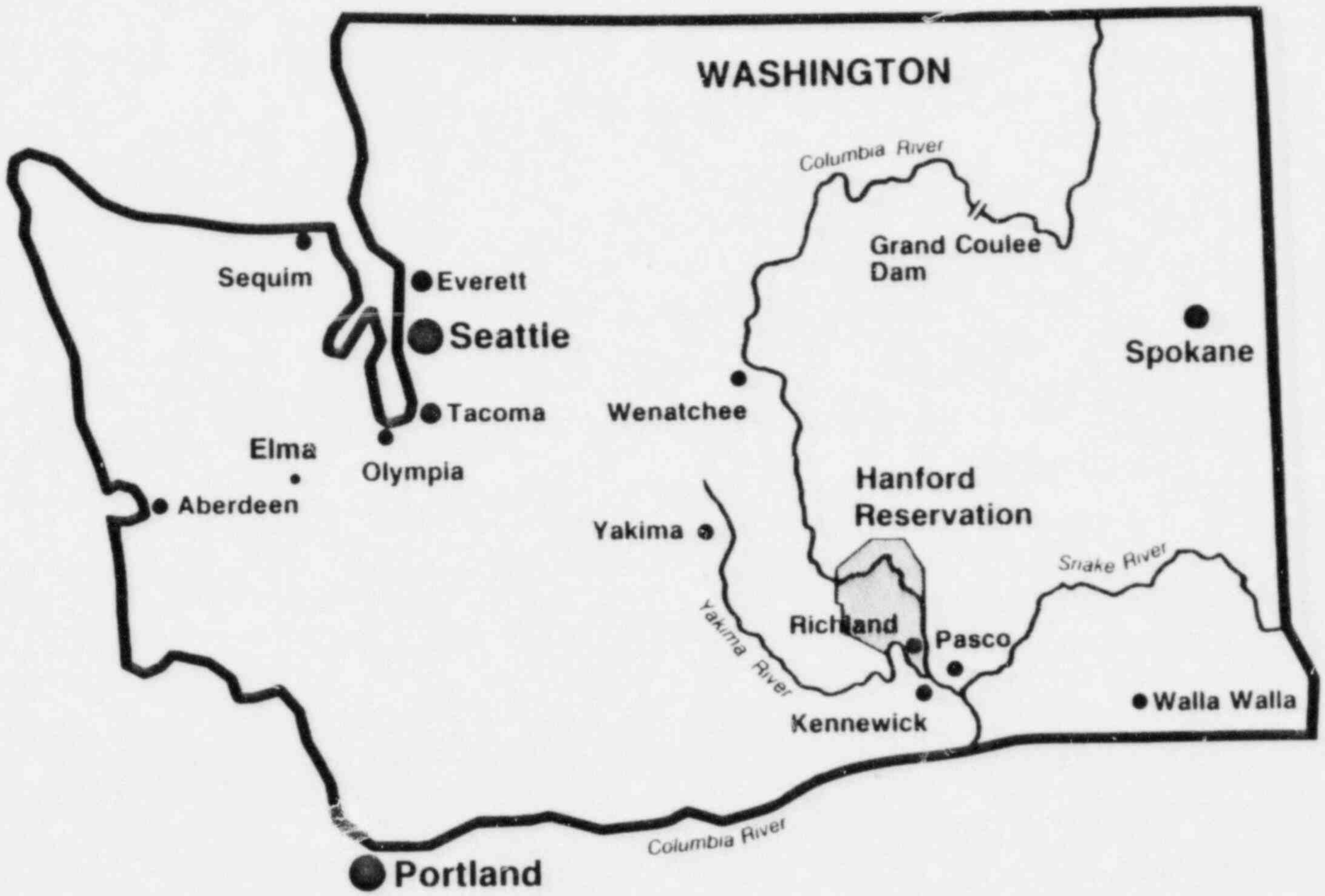
WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

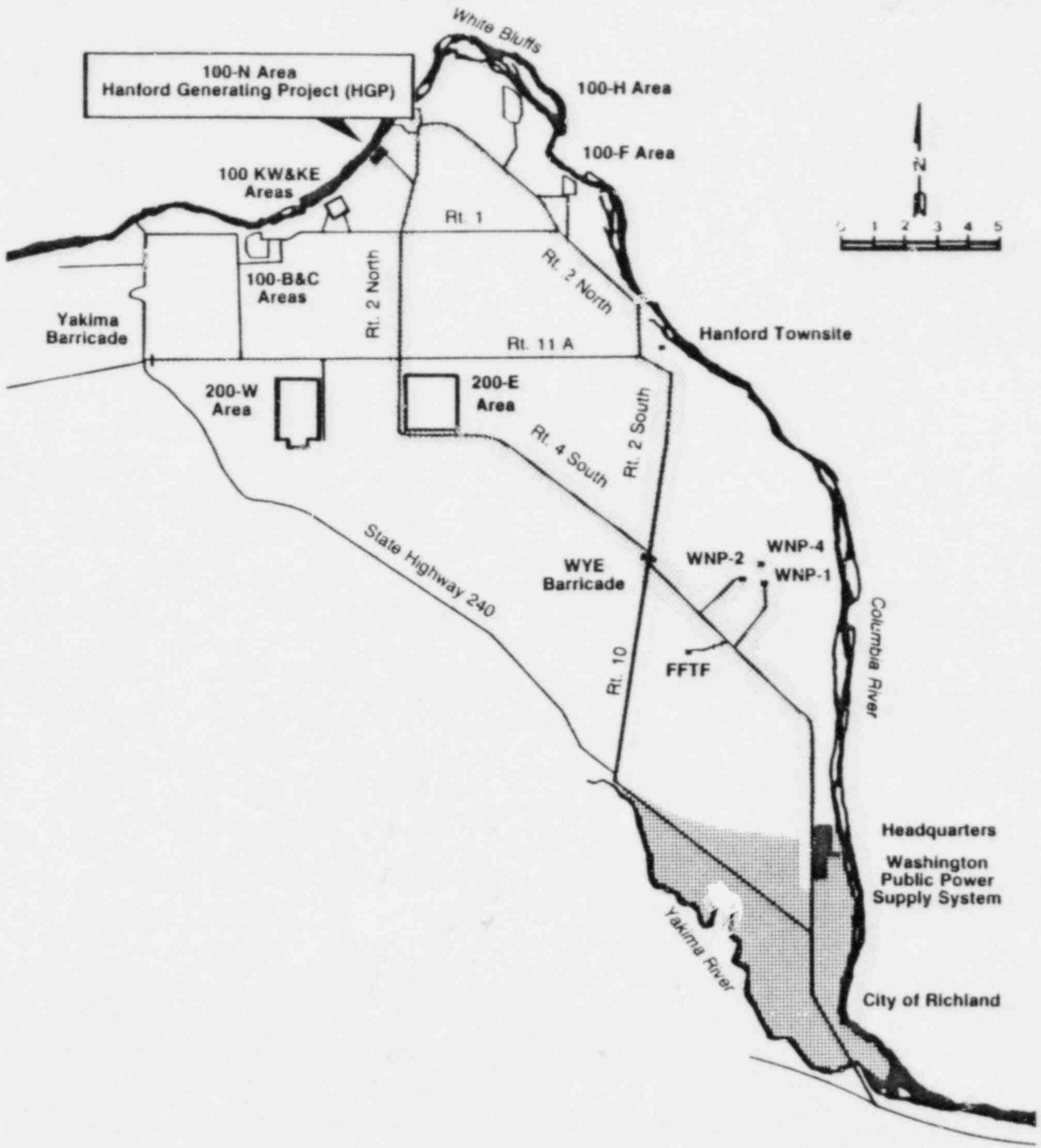
WNP-2
ACRS SUBCOMMITTEE
MEETING

SEPTEMBER 2-3, 1982
RICHLAND, WASHINGTON



Washington State Map




White Bluffs
100-N Area
Hanford Generating Project (HGP)
100-H Area
100-F Area
100 KW&KE
Areas
Rt. 1
N
0 1 2 3 4 5
100-B&C
Areas
Rt. 2 North
Rt. 2 North
Yakima
Barricade
Rt. 11 A
Hanford Townsite
200-W
Area
200-E
Area
Rt. 4 South
Rt. 2 South
State Highway 240
WYE
Barricade
WNP-2
WNP-4
WNP-1
Rt. 10
FFTF
Columbia River
Headquarters
Washington
Public Power
Supply System
Yakima River
City of Richland

CORPORATE ORGANIZATION
& MANAGEMENT

CORPORATE ORGANIZATION & MANAGEMENT

- POWER GENERATION ORGANIZATION

W. C. BIBB

DIRECTOR, POWER GENERATION

821702

WASHINGTON PUBLIC POWER SUPPLY SYSTEM MISSION

- MUNICIPAL CORPORATION CREATED TO BUILD AND OPERATE ELECTRICAL GENERATING FACILITIES FOR NORTHWEST UTILITIES
- NO MARKETING OR DISTRIBUTION RESPONSIBILITIES
- VIRTUALLY ALL NUCLEAR COMPANY

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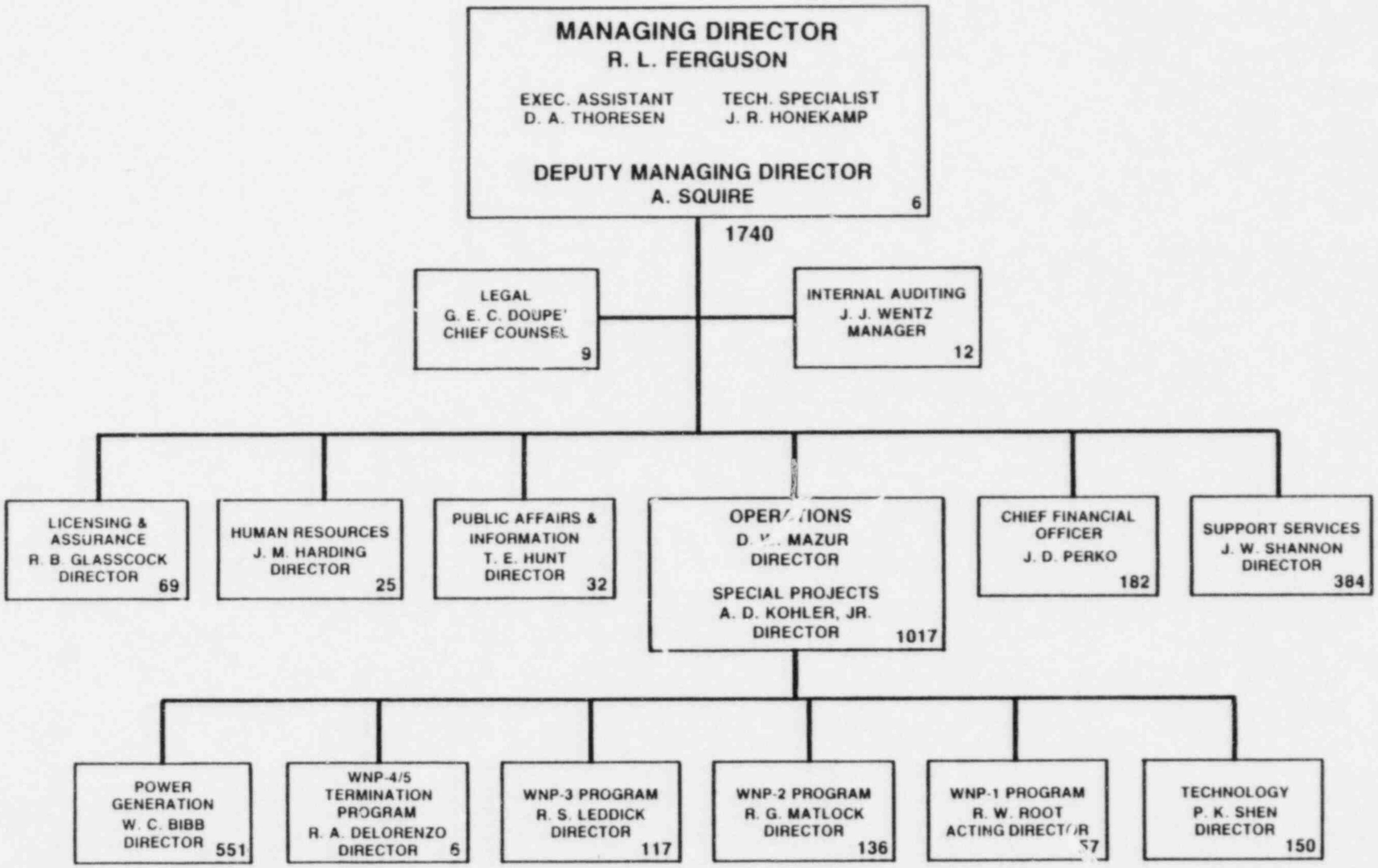
WASHINGTON PUBLIC POWER SUPPLY SYSTEM



ORGANIZATIONAL RESPONSIBILITIES

MANAGING DIRECTOR	ESTABLISH POLICY AND DIRECTION FOR SAFE AND EFFICIENT MANAGEMENT OF ALL SUPPLY SYSTEM ACTIVITIES . . . ACCOUNTABLE TO BOARD OF DIRECTORS FOR SAFE AND SUCCESSFUL COMPLETION AND OPERATION OF SUPPLY SYSTEM ELECTRICAL GENERATING FACILITIES.
DIRECTOR OF OPERATIONS	RESPONSIBLE AND ACCOUNTABLE TO THE MANAGING DIRECTOR FOR SAFE AND SUCCESSFUL CONSTRUCTION AND OPERATION OF SUPPLY SYSTEM GENERATING FACILITIES.
DIRECTOR, SUPPORT SERVICES	PROVIDES ADMINISTRATIVE, SECURITY, HEALTH PHYSICS, INDUSTRIAL SAFETY, EMERGENCY PREPAREDNESS, FIRE PROTECTION AND TECHNICAL TRAINING SUPPORT SERVICES FOR THE SUPPLY SYSTEM PLANTS.
DIRECTOR, LICENSING AND ASSURANCE	PROVIDES LICENSING SUPPORT, QUALITY ASSURANCE, AND NUCLEAR SAFETY ASSURANCE FOR SUPPLY SYSTEM NUCLEAR PLANTS.

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ORGANIZATIONAL RESPONSIBILITIES (continued)

DIRECTOR, POWER GENERATION	RESPONSIBLE AND ACCOUNTABLE TO THE DIRECTOR OF OPERATIONS FOR SAFE AND EFFICIENT OPERATION OF SUPPLY SYSTEM GENERATING PROJECTS.
WNP-2 PROGRAM DIRECTOR	RESPONSIBLE AND ACCOUNTABLE FOR THE SAFE AND SUCCESSFUL COMPLETION OF THE WNP-2 PROJECT . . . ACCOMPLISHED THROUGH THE MANAGEMENT AND DIRECTION OF A/E AND CM ORGANIZATIONS AND SUPPLY SYSTEM PERSONNEL.
DIRECTOR, TECHNOLOGY	PROVIDES FOR TECHNICAL SUPPORT OF PROJECT ACTIVITIES IN AREAS SUCH AS SYSTEMS ENGINEERING, GENERATION ENGINEERING, NUCLEAR ENGINEERING SERVICES, FUELS, ENVIRONMENTAL, AND TECHNICAL INFORMATION SYSTEMS . . . RESPONSIBLE FOR PLANT DESIGN AND DESIGN CONTROLS FOR OPERATIONAL PLANTS.

821702

NUCLEAR EXPERIENCE OF KEY MANAGEMENT OFFICIALS

Individual	Title	Total Years Nuclear Experience
Mr. R. L. Ferguson	Managing Director	20
Mr. A. Squire	Deputy Managing Director	30
Mr. D. W. Mazur	Director of Operations	19
Dr. R. G. Matlock	WNP-2 Program Director	21
Mr. C. S. Carlisle	WNP-2 Deputy Program Director	35
Mr. W. C. Bibb	Director, Power Generation	28
Mr. J. D. Martin	WNP-2 Plant Manager	22
Mr. J. R. Holder	Manager, Generation Services	11
Mr. R. R. Stickney	Manager, Generation Training	16
Dr. P. K. Shen	Director, Technology	15
Mr. J. W. Shannon	Director, Support Services	30
Mr. R. B. Glasscock	Director, Licensing and Assurance	24

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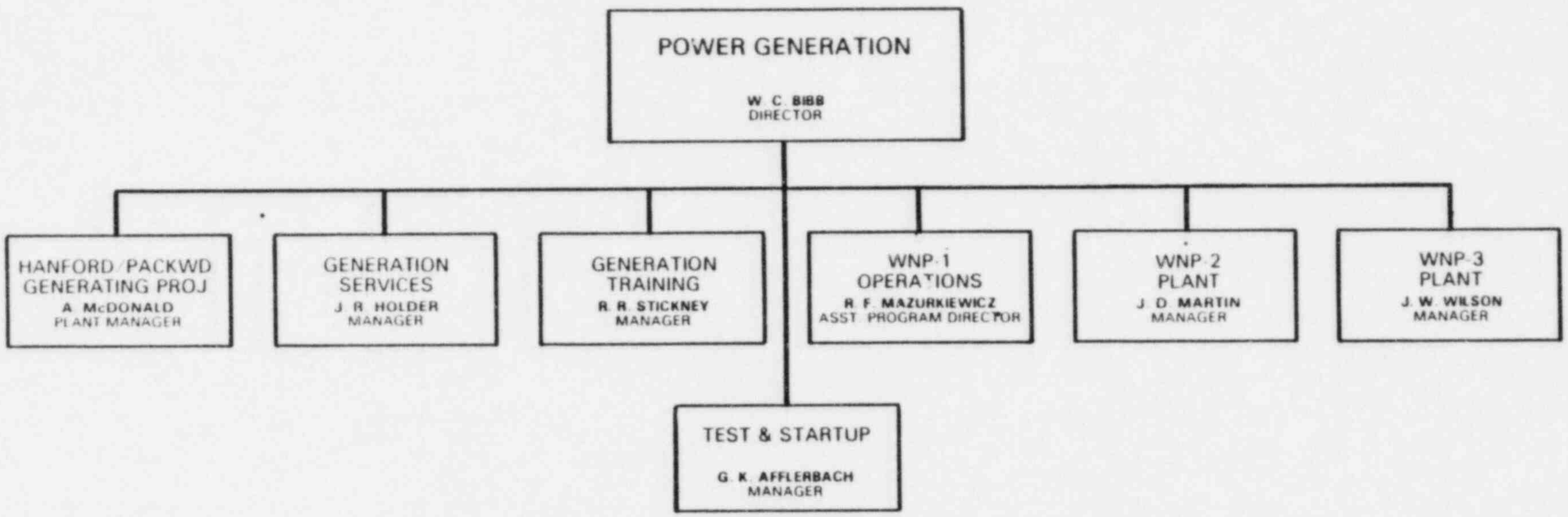
POWER GENERATION ORGANIZATION



PLANT SUPPORT FUNCTIONS

SUPPORT SERVICES DIRECTORATE

- RADIOLOGICAL & CHEMISTRY SUPPORT SERVICES
- SECURITY
- EMERGENCY PREPAREDNESS PLANNING
- INDUSTRIAL SAFETY, INDUSTRIAL HYGIENE, FIRE PROTECTION
- ADMINISTRATIVE SERVICES AND RECORDS MANAGEMENT SUPPORT

LICENSING AND ASSURANCE DIRECTORATE

- INDEPENDENT QA OVERVIEW
- QA POLICY AND GUIDANCE
- LICENSING COORDINATION AND NRC INTERFACE
- OPERATIONAL NUCLEAR SAFETY ASSURANCE

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PLANT SUPPORT FUNCTIONS (continued)

CENTRAL SUPPORT FROM POWER GENERATION

- DEVELOPMENT OF OPERATING POLICY
- DEVELOPMENT OF TRAINING POLICIES
- ASSISTS WITH GENERAL TRAINING, SIMULATOR TRAINING, AND COLLEGE TECHNOLOGY/ACADEMIC PROGRAMS
- OPERATING EXPERIENCE PROGRAM/REVIEW (SEE-IN), NOMIS, PPICS, ETC.
- ADMINISTRATIVE SUPPORT
- LABOR SERVICES
- NDE—PROCEDURES, DATA ANALYSIS AND EVALUATION, TECHNIQUE METHODOLOGY, STANDARDS
- STANDARDS LABORATORY

PLANT SUPPORT FUNCTIONS (continued)

TECHNOLOGY DIRECTORATE

- SPECIAL TECHNICAL EXPERTISE
  - WATER CHEMISTRY AND MATERIALS, ETC.
- FUEL MANAGEMENT
  - INCLUDES PLANNING, PROCURING AND LICENSING RELOAD CORES, ENSURING FUEL AVAILABILITY
- ENVIRONMENTAL MONITORING
- REACTOR SAFETY AND CORE ANALYSIS
- ENGINEERED MODIFICATION, INCLUDING CONFIGURATION CONTROL
  - PLANT MANAGER AUTHORIZES WORK
  - ENGINEERING OBTAINS MODIFICATION DESIGN IN ACCORDANCE WITH BASELINE OR APPROVES CHANGE TO BASELINE
  - PLANT AUTHORIZES (THROUGH P.O.C.) WORK AND IMPLEMENTS

821702

PLANT SUPPORT FUNCTIONS
(continued)

CORPORATE NUCLEAR SAFETY REVIEW BOARD

- INDEPENDENT ASSESSMENT OF NUCLEAR SAFETY MATTERS
- MEETS TECHNICAL SPECIFICATION REQUIREMENTS
- UTILIZES OUTSIDE MEMBERS AND CONSULTANTS

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SUMMARY
CORPORATE ORGANIZATION

- CORPORATE COMMITMENT TO SAFETY AND OPERATIONAL EXCELLENCE
- TOP LEVEL MANAGERS HAVE SUBSTANTIAL NUCLEAR EXPERIENCE
- ADEQUATE STAFF FOR OPERATION AND TECHNICAL SUPPORT FUNCTIONS

821702

WNP-2
CONSTRUCTION MANAGEMENT ORGANIZATION

R. G. MATLOCK

**PROGRAM DIRECTOR,
WNP-2**

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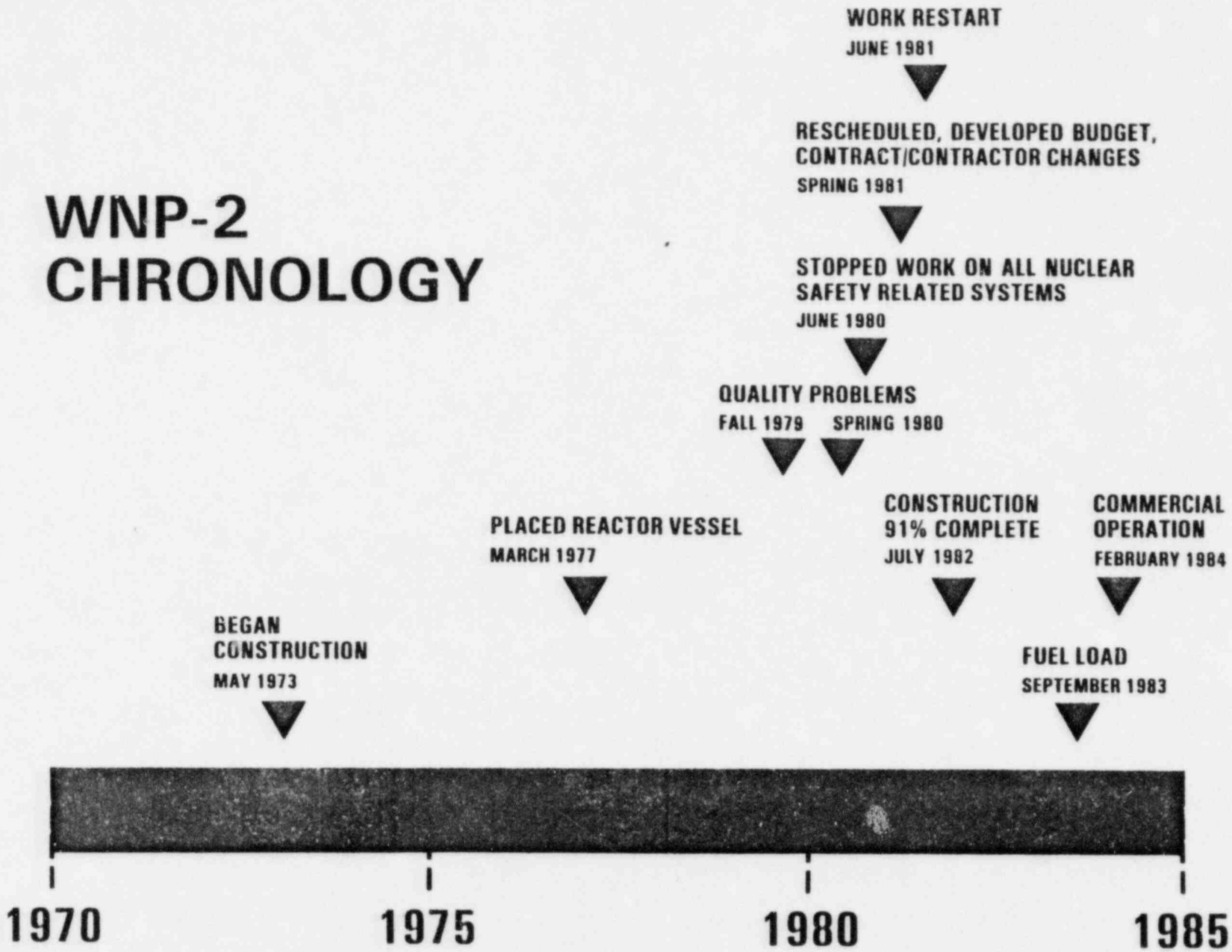
WNP-2 CHRONOLOGY



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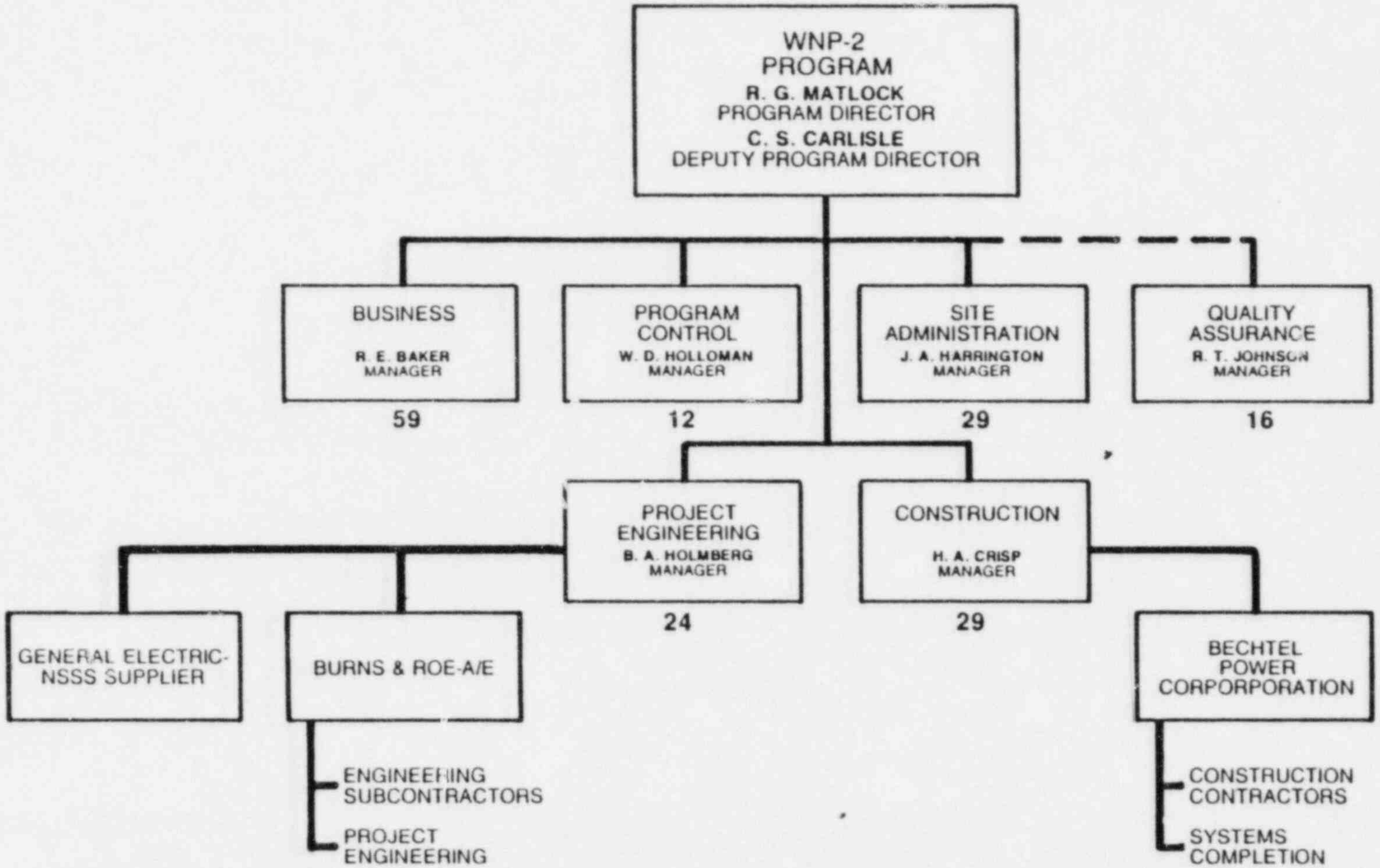
WNP-2 PROGRAM ORGANIZATION



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MAJOR ORGANIZATION TRANSITIONS

- OPERATIONAL QUALITY ASSURANCE DEPARTMENT (COMPLETED 11/81)
- PLANT OPERATIONS DEPARTMENT (COMPLETED 3/82)
- TEST AND STARTUP DEPARTMENT (COMPLETED 3/82)
- PROJECT QUALITY ASSURANCE DEPARTMENT (COMPLETED 4/82)
- ASSUMPTION OF DESIGN RESPONSIBILITY BY THE SUPPLY SYSTEM
- PHASE OUT OF CONSTRUCTION ACTIVITIES AND TRANSITION TO GENERATION

WNP-2 STATUS/SCHEDULE

- CONSTRUCTION - > 91% COMPLETE
- SYSTEMS TURNOVER - 20% COMPLETE
- SYSTEMS PROVISIONAL ACCEPTANCE - 60% COMPLETE
- SUPPORT SYSTEMS - OPERATIONAL
- ROOM TURNOVER - 40% COMPLETE
- CURRENT ONSITE WORK FORCE - 5400
- HYDRO - COMPLETE
- FUEL LOAD - SEPTEMBER 1983
- COMMERCIAL OPERATION - FEBRUARY 1984
- SPECIAL NUCLEAR MTLS. LICENSE - RECEIVED
- FUEL FABRICATED & STORED

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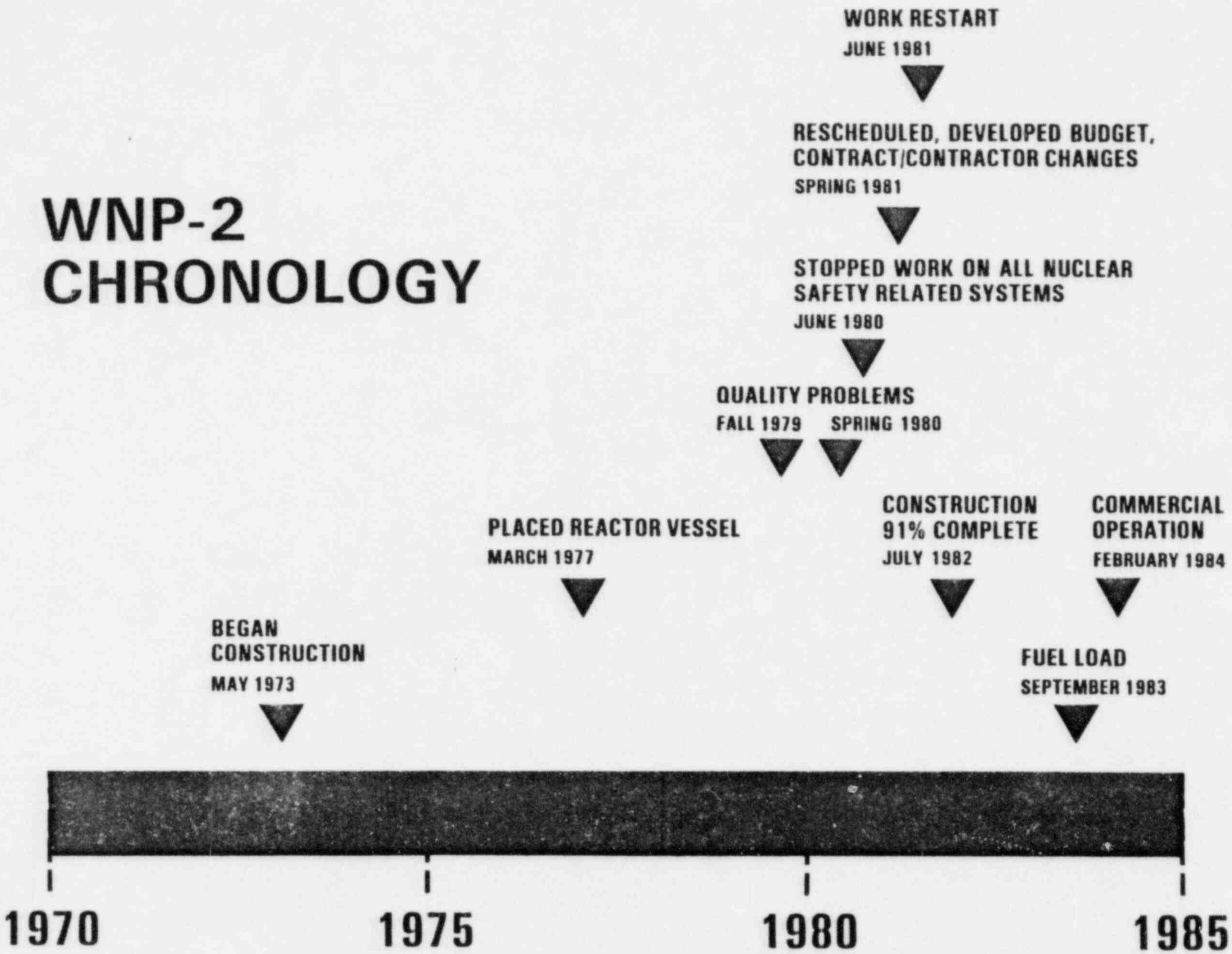
WNP-2 CHRONOLOGY



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JULY 1980 STOP WORK

THE PROBLEM

- REQUIRED CONSTRUCTION QUALITY NOT BEING ACHIEVED
- PROJECT MANAGEMENT ACTIONS NOT SUCCESSFUL
- BACKLOG OF UNRESOLVED AND RECURRENT PROBLEMS INCREASING

THE RECOVERY PROCESS

- RESTART PROGRAM—A PROGRAM TO ASSURE THAT PROPER QUALITY IS ACHIEVED FOR FUTURE CONSTRUCTION
- QUALITY VERIFICATION PROGRAM—A PROGRAM TO VERIFY CONSTRUCTION QUALITY FOR WORK COMPLETED BEFORE JULY 1980 AND/OR INITIATE CORRECTIVE ACTION AS NECESSARY

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RESTART PROGRAM

- SCOPE INCLUDED QUALITY CLASS I AND/OR SEISMIC CATEGORY I COMPONENTS, STRUCTURES, AND SYSTEMS.
- PROGRAM INCLUDED REVIEW AND EVALUATION OF CONTRACTOR'S QA PROGRAMS, WORK, AND INSPECTION PROCEDURES AND MANAGEMENT CONTROL SYSTEMS.
- CHANGES WERE MADE TO ASSURE COMPLIANCE TO SPECIFICATIONS, CODES AND STANDARDS, AND REGULATORY REQUIREMENTS AND TO IMPLEMENT IMPROVED MANAGEMENT CONTROLS.

821702

OTHER PROGRAM IMPROVEMENTS

- STRENGTHENED PROJECT MANAGEMENT BY CONSOLIDATING TOTAL PROGRAM RESPONSIBILITY UNDER A PROGRAM DIRECTOR REPORTING DIRECTLY TO THE MANAGING DIRECTOR.
- HIRED BECHTEL POWER CORPORATION AS SYSTEMS COMPLETION CONTRACTOR AND CONSTRUCTION MANAGER.
- ASSIGNED THE A/E UNDIVIDED RESPONSIBILITY FOR ENGINEERING IN SUPPORT OF PROJECT COMPLETION.
- REVIEWED AND REDUCED DEFICIENCY BACKLOGS TO WITHIN NEW PERFORMANCE MEASUREMENT LIMITS.
- ADDITIONALLY — REASSIGNMENT OF REMAINING PIPING MECHANICAL WORK TO BECHTEL FORCED A COMPLETE ACCEPTANCE REVIEW OF PAST ASME WORK AND ASSOCIATED DOCUMENTATION DUE TO THE CHANGE IN CODE RESPONSIBILITIES.

QUALITY VERIFICATION PROGRAM

- SCOPE — QCI/SCI WORK COMPLETED AND ACCEPTED BEFORE JULY 1980
  — DOCUMENTATION REVIEW AND HARDWARE REINSPECTION
  — FOR EACH SYSTEM A RANDOM SAMPLE OF AT LEAST 10%
- MAJOR ELEMENTS — SYSTEMS COMPLETION
  — PREPURCHASE & INACTIVE CONTRACTS
  — SPECIAL TASKS
- STATUS — PROGRAM 75% COMPLETE
  — PROJECTED COMPLETION IN MARCH 1983
- IMPLEMENTATION BY CONTRACTORS UNDER SUPPLY SYSTEM DIRECTION
- PERIODIC REPORTS TO THE WNP-2 PROGRAM DIRECTOR WITH BI-MONTHLY REPORTS TO NRC REGION V

821702

QUALITY VERIFICATION PROGRAM (QVP) FINDINGS

- CONSTRUCTION PROBLEMS FOUND BY THE QVP WERE BEING IDENTIFIED BY THE PROJECT IN SPECIAL TASK EFFORTS
- DEFICIENCY DOCUMENT REVIEWS TO DATE INDICATE THAT PAST TECHNICAL DISPOSITIONS WERE CORRECT.
- EXCEPT AS ALREADY IDENTIFIED AND BEING RESOLVED BY SPECIAL PROGRAMS, NATURE AND NUMBER OF DEFICIENCIES ENCOUNTERED BY QVP PROVIDE CONFIDENCE IN THE WORK COMPLETED BEFORE JULY 1980.
- QVP IS ACCOMPLISHING ITS PRIMARY PURPOSE OF VERIFYING PAST WORK AND INITIATING CORRECTIVE ACTION WHERE NECESSARY.

821702

CONTRACT 215
DOCUMENTATION REVIEW

CONCLUSION: THE MATERIAL AND INSTALLATION DOCUMENTATION IS IN COMPLIANCE WITH CODE AND SPECIFICATION REQUIREMENTS WITH EXCEPTION TO IDENTIFIED DEFICIENCIES. THESE DEFICIENCIES ARE NOT CAUSING EXTENSIVE HARDWARE REWORK. THE ORIGINAL CONCERNS FOR WIDESPREAD DOCUMENTATION PROBLEMS HAVE NOT BEEN CONFIRMED.

- REVIEWED AND EVALUATED ALL QCI PURCHASE ORDERS TO ESTABLISH MATERIAL ACCEPTABILITY (CONTRACT 215 AND BECHTEL).
- REVIEWED AND EVALUATED ALL CONSTRUCTION DOCUMENTATION TO ESTABLISH INSTALLATION ACCEPTABILITY AND TO PRODUCE ASME CODE DATA REPORTS (CONTRACT 215 - 100%/BECHTEL - 100% → 15%).
- MINIMIZED HARDWARE IMPACT BY:
  - USING CODE CASES AND OPTIONAL CODE PROVISIONS.
  - ACQUIRING MISSING DOCUMENTATION FROM SUPPLIERS.
  - PERFORMING ADDITIONAL NONDESTRUCTIVE EXAMINATIONS.
- CONFIRMED WELD QUALITY BY REVIEW OF ALL ASME RADIOGRAPHS AND SAMPLE FIELD REINSPECTION.

821760-3A

WBG DOCUMENTATION REVIEW

• PURCHASE ORDERS REVIEWED	14,000
• INSTALLATION PACKAGES REVIEWED	9,500
• NDE RECORDS REVIEWED (ASME RADIOGRAPHS)	55,000 (2,690)
• EXCEPTIONS IDENTIFIED	4,825
• EXCEPTIONS VALIDATED	3,725
• MISSING DOCUMENTATION INCOMPLETE NDE	1,300
• RESOLVED BY CODE CASES AND OPTIONAL CODE PROVISIONS, ETC.	1,425
• NONCONFORMANCES WRITTEN	1,000

821760-4A

CONSTRUCTION PROGRAM SUMMARY

WE:

- HAVE EXPERIENCED DESIGN AND CONSTRUCTION ORGANIZATIONS CONVERGING ON PROJECT COMPLETION.
- HAVE RESOLVED OR ARE RESOLVING PAST PROJECT CONSTRUCTION QUALITY PROBLEMS AND IMPLEMENTED PROGRAMS TO ASSURE THE ACCEPTABILITY OF HARDWARE INSTALLED BEFORE JULY 1980.
- HAVE CONTROLS AND VERIFICATION MEANS IN PLACE TO ASSURE THE DESIGN IS CORRECT AND THAT CONSTRUCTION IS IN ACCORDANCE WITH THE DESIGN.
- HAVE PLANNED AND ARE IN THE PROCESS OF IMPLEMENTING AN ORDERLY TRANSITION FROM CONSTRUCTION TO OPERATION (PLANT COMPLETION PLAN).

PLANT COMPLETION PLAN

- CONSTRUCTION COMPLETION
- ORGANIZATIONAL READINESS
- OPERATIONAL READINESS
- PLANT VERIFICATION
  - — REQUIREMENTS AND DESIGN VERIFICATION
  - — CONSTRUCTION VERIFICATION
  - — PERFORMANCE VERIFICATION
  - — OPERATING ENVELOPE VERIFICATION

821702

ACCEPTANCE REVIEW/ QUALITY ASSURANCE

J. R. HONEKAMP

TECHNICAL SPECIALIST

821702

ACCEPTANCE REVIEW PLANS

R. L. FERGUSON LETTER OF JANUARY 22, 1981

. . . DEVELOP DETAILED "ACCEPTANCE REVIEW" PLANS FOR EACH OF OUR PROJECTS WHICH WILL ASSURE A THOROUGH, SYSTEMATIC REVIEW BY SUPPLY SYSTEM PERSONNEL OF OUR NUCLEAR PLANTS PRIOR TO TURNOVER FROM OUR CONTRACTORS FOR COMMERCIAL OPERATION AND WHICH WILL CONSTITUTE A WELL-DOCUMENTED BASIS FOR MY ACCEPTANCE OF PLANT COMPLETION, SAFETY AND TECHNICAL ADEQUACY.

. . . FOR WNP-2, SPECIAL CONSIDERATION SHOULD BE GIVEN TO ASSURING THAT ANY UNDETECTED QUALITY DEFECTS THAT SIGNIFICANTLY AFFECT PLANT PERFORMANCE OR SAFETY WOULD BE IDENTIFIED AND CORRECTED IN THE COURSE OF OUR FUNCTIONAL TESTING AND ACCEPTANCE REVIEWS.

PLANT COMPLETION PLAN

- COORDINATION POINT
- DOCUMENTATION OF ACCEPTANCE REVIEWS
- PHASE I OF THE PLAN (UP TO FUEL LOAD) WAS ISSUED 12/81 AND COVERS:

CONSTRUCTION
EMERGENCY PREPAREDNESS
ENGINEERING
ENVIRONMENTAL REQUIREMENTS
HEALTH PHYSICS/CHEMISTRY
INDUSTRIAL SAFETY/
FIRE PROTECTION
LEGAL/FINANCIAL
NUCLEAR FUEL
OPERATIONAL READINESS
PREOPERATIONAL TESTING
QUALITY ASSURANCE
RECORDS
REGULATORY/LICENSING
SECURITY
STARTUP TESTING
SUPPLIES MANAGEMENT/
LOGISTICS PLANNING
MILESTONE SCHEDULE

821702

PLANT VERIFICATION APPROACH

- PLANT VERIFICATION PROGRAM PLAN
  - BASIS FOR CONFIRMATION WNP-2 DESIGNED AND CONSTRUCTED AS COMMITTED
- OVERVIEW OF PROGRAM DEVELOPMENT AND IMPLEMENTATION FROM OFFICE OF THE MANAGING DIRECTOR
- UTILIZE OUTSIDE INDEPENDENT TECHNICAL AUDITOR TO:
  - REVIEW PROGRAM SCOPE
  - AUDIT IMPLEMENTATION
  - ASSURE OBJECTIVITY AND INDEPENDENCE
- TRACK COMPLETION OF PLANT VERIFICATION ACTIVITIES IN PLANT COMPLETION PLAN

PLANT VERIFICATION INCLUDES:

- REQUIREMENTS VERIFICATION
- DESIGN VERIFICATION
- CONSTRUCTION VERIFICATION
- PERFORMANCE VERIFICATION
- OPERATING ENVELOPE VERIFICATION

821702

ADEQUACY OF DESIGN ESTABLISHED BY:

- EVIDENCE THAT THE BASIC DESIGN PROCESS WAS SOUND
  - QA REVIEWS AND AUDITS OF DESIGN PROCESS
  - EXTERNAL TECHNICAL AUDITS AND DESIGN REVIEWS BY GE, BECHTEL, BRI, AND EDS
  - MANAGEMENT AND TECHNICAL OVERVIEW BY THE SUPPLY SYSTEM

- REQUIREMENTS AND DESIGN REVERIFICATION
  - REVIEW OF THE ENGINEERING RECORD ON A SYSTEM-BY-SYSTEM BASIS FOR ALL SYSTEMS
  - REVIEW OF THE DESIGN REQUIREMENTS FOR ALL SAFETY SYSTEMS
  - DETAILED REVIEW OF THE DESIGN OF THREE SYSTEMS

821702

ASSURANCE OF OBJECTIVITY/INDEPENDENCE IS PROVIDED BY:

- INDEPENDENCE OF REVIEWERS
- FINDINGS REVIEW COMMITTEE
- DIRECT OVERSIGHT FROM THE OFFICE OF THE MANAGING DIRECTOR
- PROGRAM REVIEW AND AUDIT BY OUTSIDE TECHNICAL AUDITOR

821702

SCOPE OF OUTSIDE INDEPENDENT TECHNICAL AUDITOR

PHASE I
- REVIEW OF THE ADEQUACY OF THE WNP-2 PLANT VERIFICATION PROGRAM
- RECOMMEND APPROACH FOR INDEPENDENT REVIEWS AND AUDITS OF THE IMPLEMENTATION OF KEY VERIFICATION ACTIVITIES.

PHASE II
- PERFORM PERIODIC REVIEWS AND AUDITS OF THE IMPLEMENTATION OF KEY VERIFICATION ACTIVITIES AND PRODUCTS.

821702

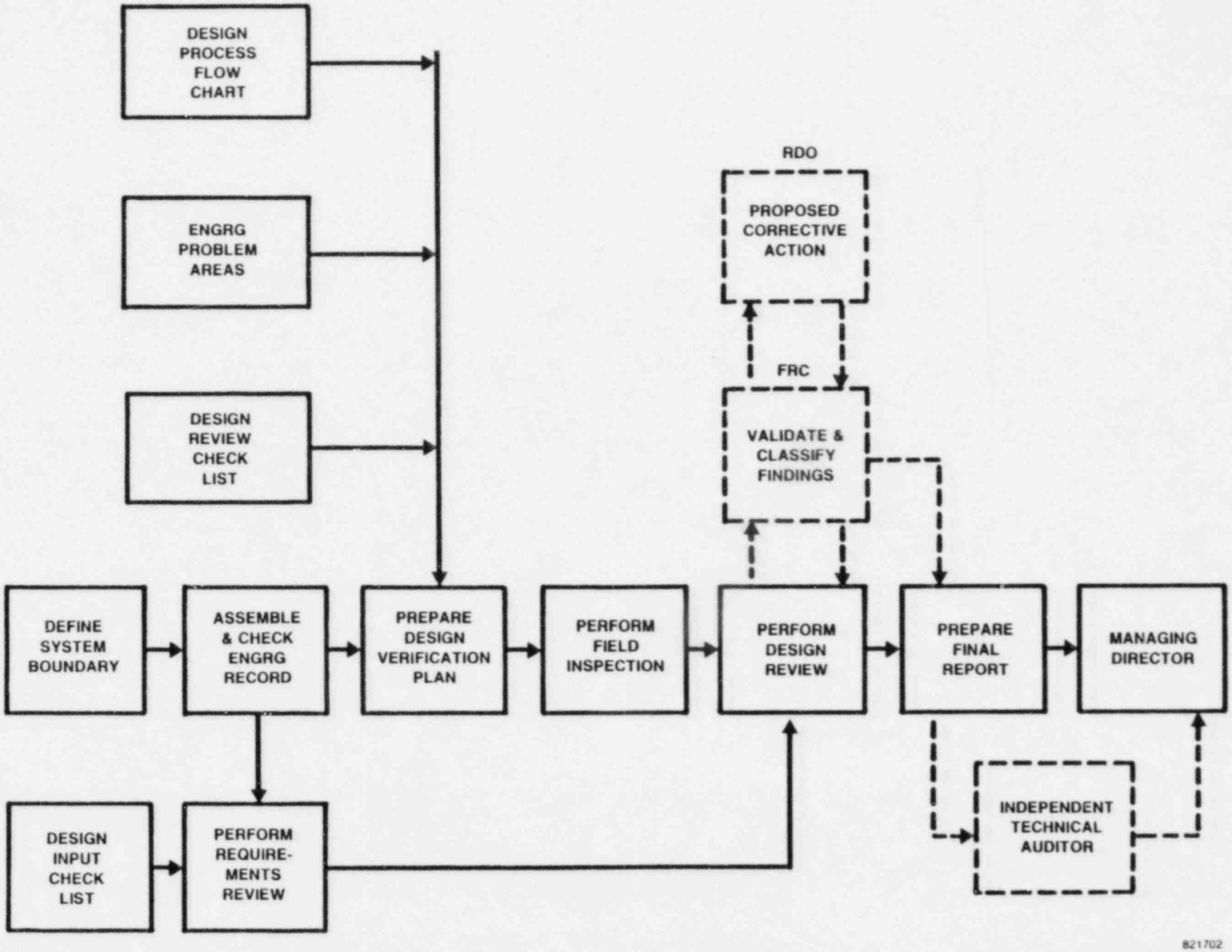
REQUIREMENTS AND DESIGN REVERIFICATION INCLUDES:

- REVIEW OF THE ENGINEERING RECORD ON A SYSTEM BASIS FOR ALL SYSTEMS
- REVIEW OF THE DESIGN REQUIREMENTS FOR ALL SAFETY SYSTEMS
- DESIGN REVERIFICATION REVIEWS (DETAILED REVIEW OF THE DESIGN OF THREE SYSTEMS)

DESIGN REVERIFICATION REVIEWS

- RHR — SUPPRESSION POOL COOLING MODE
- HPCS — INCLUDING HPCS DIESEL GENERATOR
- FEED — INCLUDING FEED PUMPS; ASME III/ANSI B31.1; QCI/QCII; SCI/SCII
- SELECTION CRITERIA
  - — IMPORTANT TO SAFETY
  - — MAJOR DESIGN INTERFACES
  - — MECHANICAL, ELECTRICAL, AND I&C
- MINIMUM OF 100 REVIEW POINTS PER SYSTEM
- INCLUDES FIELD INSPECTION TO CONFIRM THAT INSTALLED CONFIGURATION MATCHES DESIGN

821702


DESIGN PROCESS FLOW CHART
ENGRG PROBLEM AREAS
DESIGN REVIEW CHECK LIST
RDO
PROPOSED CORRECTIVE ACTION
FRC
VALIDATE & CLASSIFY FINDINGS
DEFINE SYSTEM BOUNDARY
ASSEMBLE & CHECK ENGRG RECORD
PREPARE DESIGN VERIFICATION PLAN
PERFORM FIELD INSPECTION
PERFORM DESIGN REVIEW
PREPARE FINAL REPORT
MANAGING DIRECTOR
INDEPENDENT TECHNICAL AUDITOR
DESIGN INPUT CHECK LIST
PERFORM REQUIRE-MENTS REVIEW
821702

SELECTION OF REVIEW POINTS

- FOCUS ON ITEMS NOT DEMONSTRATED IN PREOPERATIONAL AND POWER ASCENSION TEST PROGRAM
- INPUTS TO SELECTION PROCESS
  - DESIGN PROBLEM AREAS
  - MAJOR DESIGN CHANGES
  - DESIGN PROCESS FLOW CHARTS
- EXAMPLES OF REVIEW POINTS
  - VERIFICATION THAT IMPORTANT DERIVED INPUT IS CORRECT
  - VERIFICATION THAT REVISED DESIGN INPUTS WERE PROPERLY TRANSFERRED AT A KEY INTERFACE
  - DETAILED REVIEW OF A PIPE STRESS ANALYSIS

REVIEW TEAM QUALIFICATIONS

- ORGANIZATION RESPONSIBILITY FOR POST-COMMERCIAL OPERATION DESIGN CONFIGURATION CONTROL.
- TEAM MEMBERS EXPERIENCED IN DESIGN AND ANALYSIS:
  - I&C — 3 ENGINEERS, 9 YEARS AVERAGE EXPERIENCE
  - ELECTRICAL: — 3 ENGINEERS, 15 YEARS AVERAGE EXPERIENCE
  - ENGRG. MECH.: — 3 ENGINEERS, 9 YEARS AVERAGE EXPERIENCE
  - MECHANICAL: — 4 ENGINEERS, 15 YEARS AVERAGE EXPERIENCE
- MECHANICAL SYSTEMS/PIPING/HANGER STRESS, ELECTRICAL AND INSTRUMENTATION AND CONTROLS ENGINEERS ON EACH TEAM.
- ACCESSIBILITY TO MATERIALS, WELDING, STRUCTURAL, OPERATIONS, AND MAINTENANCE ENGINEERS.
- EXPERIENCED IN ASME DESIGN AUDITS.
- EXPERIENCED IN SYSTEM REVIEWS.

821702

SCHEDULE

PREPARE DRAFT PLANT VERIFICATION PROGRAM PLAN	MARCH 1982
SELECT OUTSIDE TECHNICAL AUDITOR AND ESTABLISH CONTRACT	MARCH 1982
INITIAL PROGRAM REVIEW BY OUTSIDE TECHNICAL AUDITOR	APRIL 1982
ISSUE REVISED PLAN FOR REVIEW BY OUTSIDE TECH. AUDITOR	JUNE 11, 1982
REPORT OF OUTSIDE AUDITOR ON REVISED PLAN	AUGUST 9, 1982
ENGINEERING RECORD REVIEWS	PER SYSTEM TURNOVER SCHEDULE
REQUIREMENTS REVERIFICATION REVIEWS	PER SYSTEM TURNOVER SCHEDULE
DESIGN REVERIFICATION REVIEWS REPORT	MAY 15, 1983

821702

SUMMARY

- MANAGING DIRECTOR INITIATED A FORMAL ACCEPTANCE REVIEW PROGRAM IN JANUARY 1981
- PROGRAM IS IN PLACE AND WORKING
- DESIGN REVERIFICATION REVIEWS ARE PERFORMED INDEPENDENT OF WNP-2 PROGRAM BY ORGANIZATION RESPONSIBLE FOR CONFIGURATION CONTROL AFTER STARTUP
- SCOPE AND DEPTH OF DESIGN REVERIFICATION REVIEWS WILL PROVIDE SUBSTANTIVE MEASURE OF THE QUALITY OF THE DESIGN

821702

OPERATIONS AND MAINTENANCE

- PERSONNEL SELECTION
- TRAINING

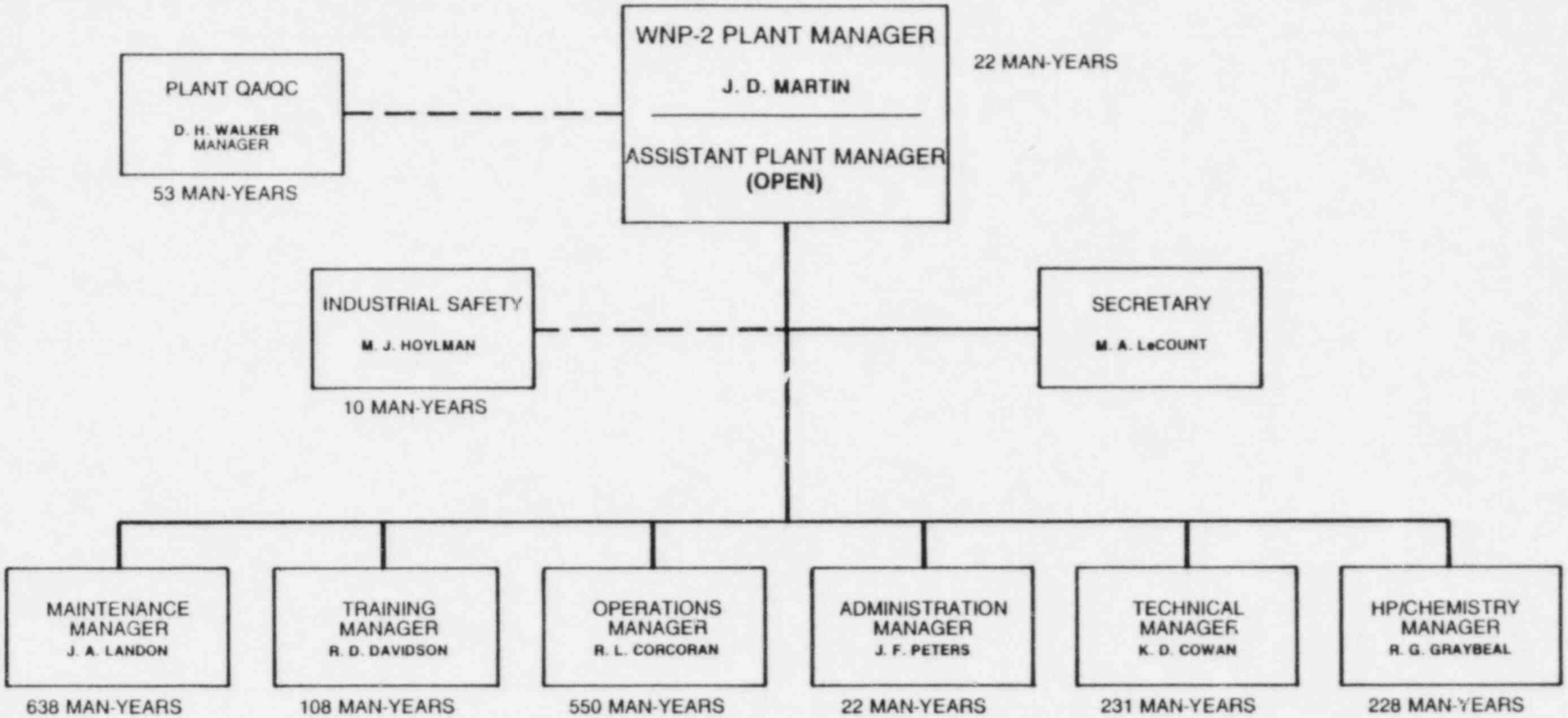
J. D. MARTIN

PLANT MANAGER, WNP-2

821541-6A

WNP-2 PLANT

NUCLEAR EXPERIENCE



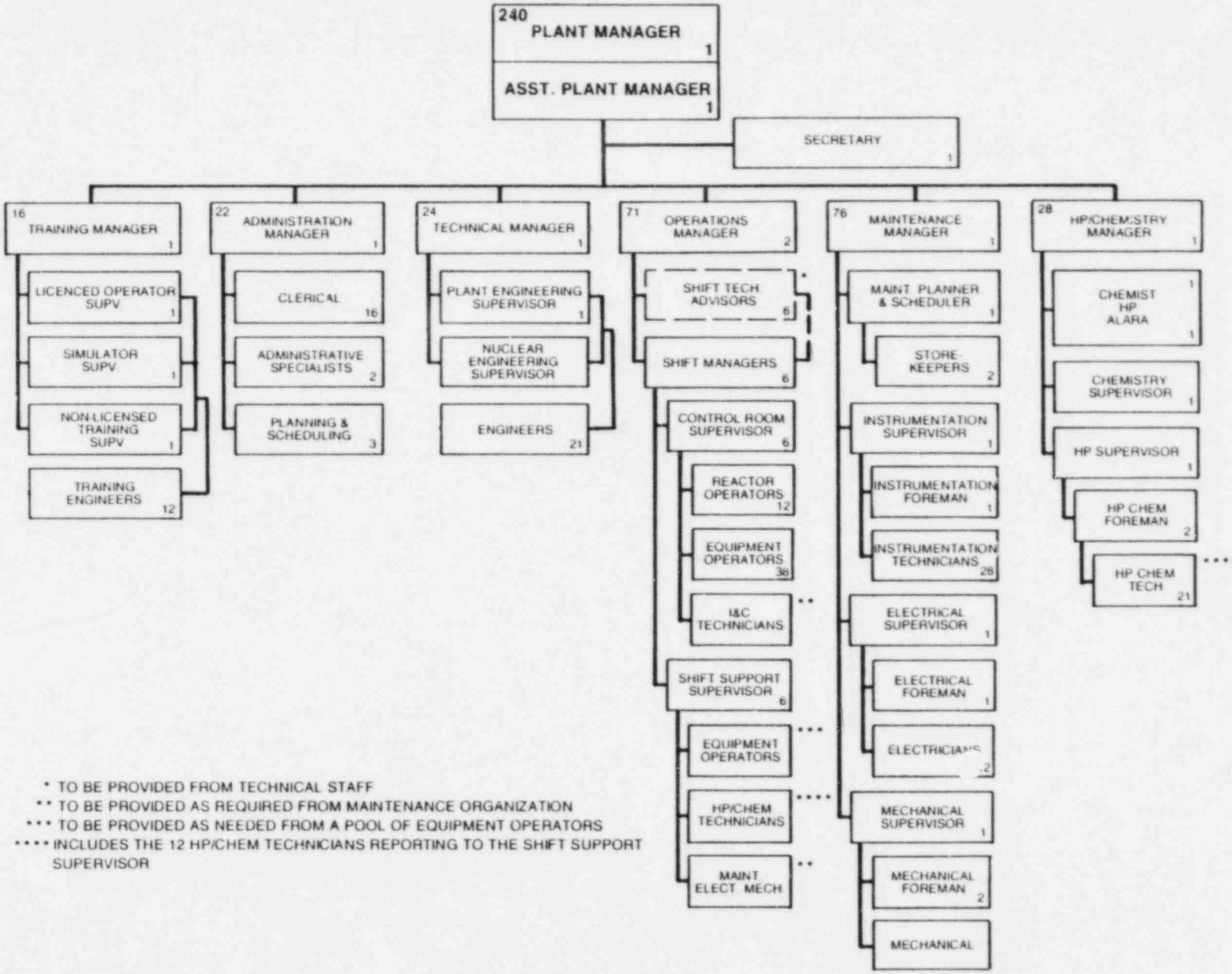
- GREATER THAN 1800 MANYEARS ONSITE NUCLEAR EXPERIENCE.

  OF WHICH

- GREATER THAN 600 MANYEARS ONSITE COMMERCIAL BWR EXPERIENCE.

821702

MATURE PLANT OPERATING ORGANIZATION



* TO BE PROVIDED FROM TECHNICAL STAFF
** TO BE PROVIDED AS REQUIRED FROM MAINTENANCE ORGANIZATION
*** TO BE PROVIDED AS NEEDED FROM A POOL OF EQUIPMENT OPERATORS
**** INCLUDES THE 12 HP/CHEM TECHNICIANS REPORTING TO THE SHIFT SUPPORT SUPERVISOR

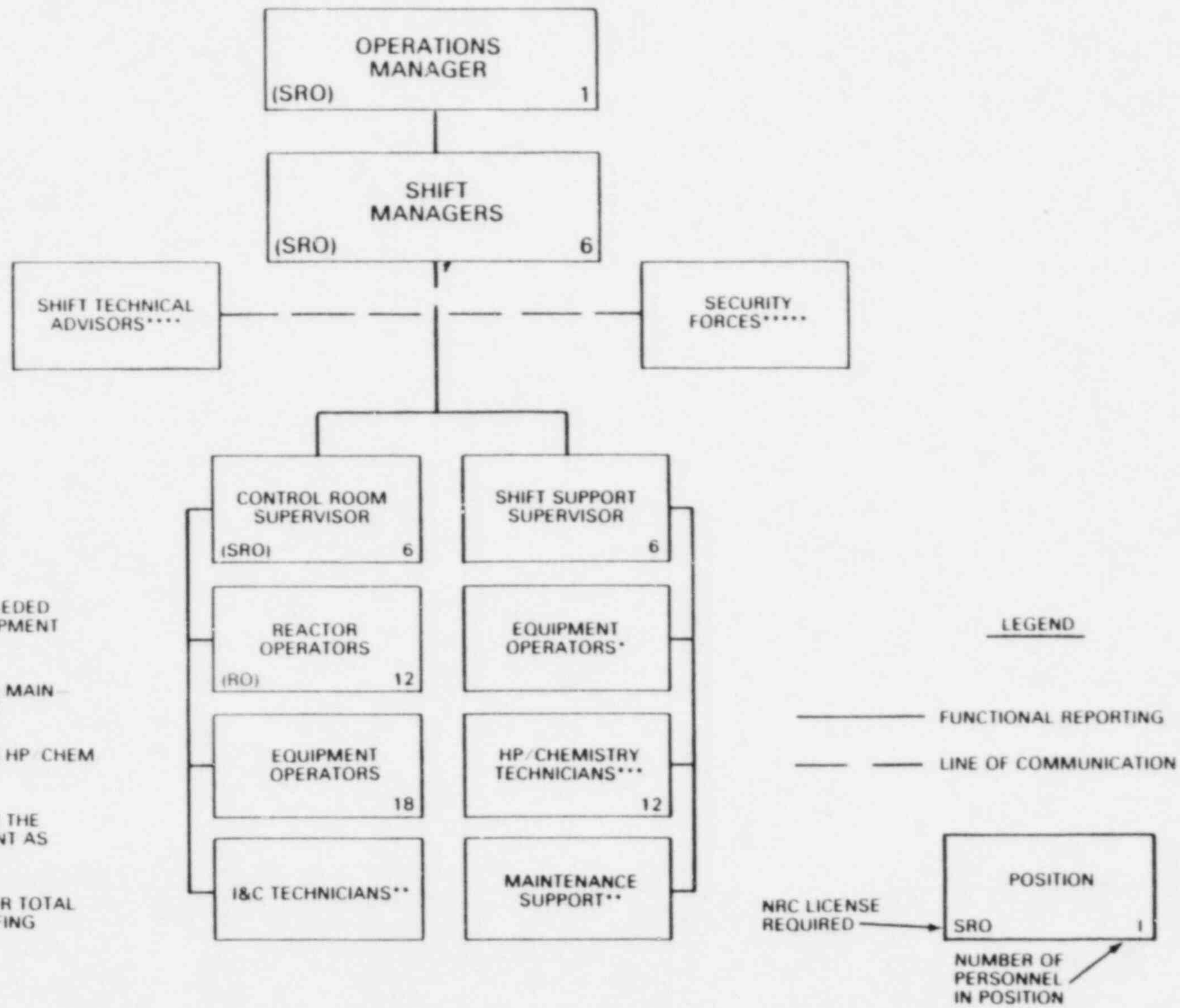
821702

SHIFT STRUCTURE

- Planning and staffing for 6 shifts (5 shifts minimum)
- Nominally 14 people per shift (9 minimum)
- Structure
  - — 4 Operating shift
  - — 1 Relief shift
  - — 1 Training shift

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WNP-2 OPERATIONS DEPARTMENT



* TO BE PROVIDED AS NEEDED FROM A POOL OF EQUIPMENT OPERATORS

** TO BE PROVIDED FROM MAINTENANCE DEPARTMENT

*** TO BE PROVIDED FROM HP/CHEM DEPARTMENT

**** TO BE PROVIDED FROM THE TECHNICAL DEPARTMENT AS REQUIRED

***** SEE SECURITY PLAN FOR TOTAL SECURITY FORCE STAFFING LEVEL

WNP-2 PLANT OPERATIONS STAFFING

		On Board 8/82	Manning at WNP-2 Fuel Load
Plant Management		2	3
Operations		71	71
Includes:	Supervision	1	2
	Principal Engineer	1	1
	Shift Managers	11	6
	CR Supervisors	5	6
	Shift Support Supervisors	0	6
	Reactor Operators	10	12
	Equipment Operators	38	38
	Operations Engineers	5	0
Maintenance		76	76
Includes:	Supervision	5	6
	Electricians	16	12
	I&C Technicians	25	28
	Mechanics	27	25
	Spare Parts	2	2
	Storekeeper	1	3
Technical		24	24
Includes:	Supervision	4	4
	Plant Engineering	11	10
	Reactor Engineering	9	10
HP/Chemistry		28	28
Includes:	Supervision	6	6
	Technicians	22	22
Administration		22	22
Training		16	16
TOTAL		239	240

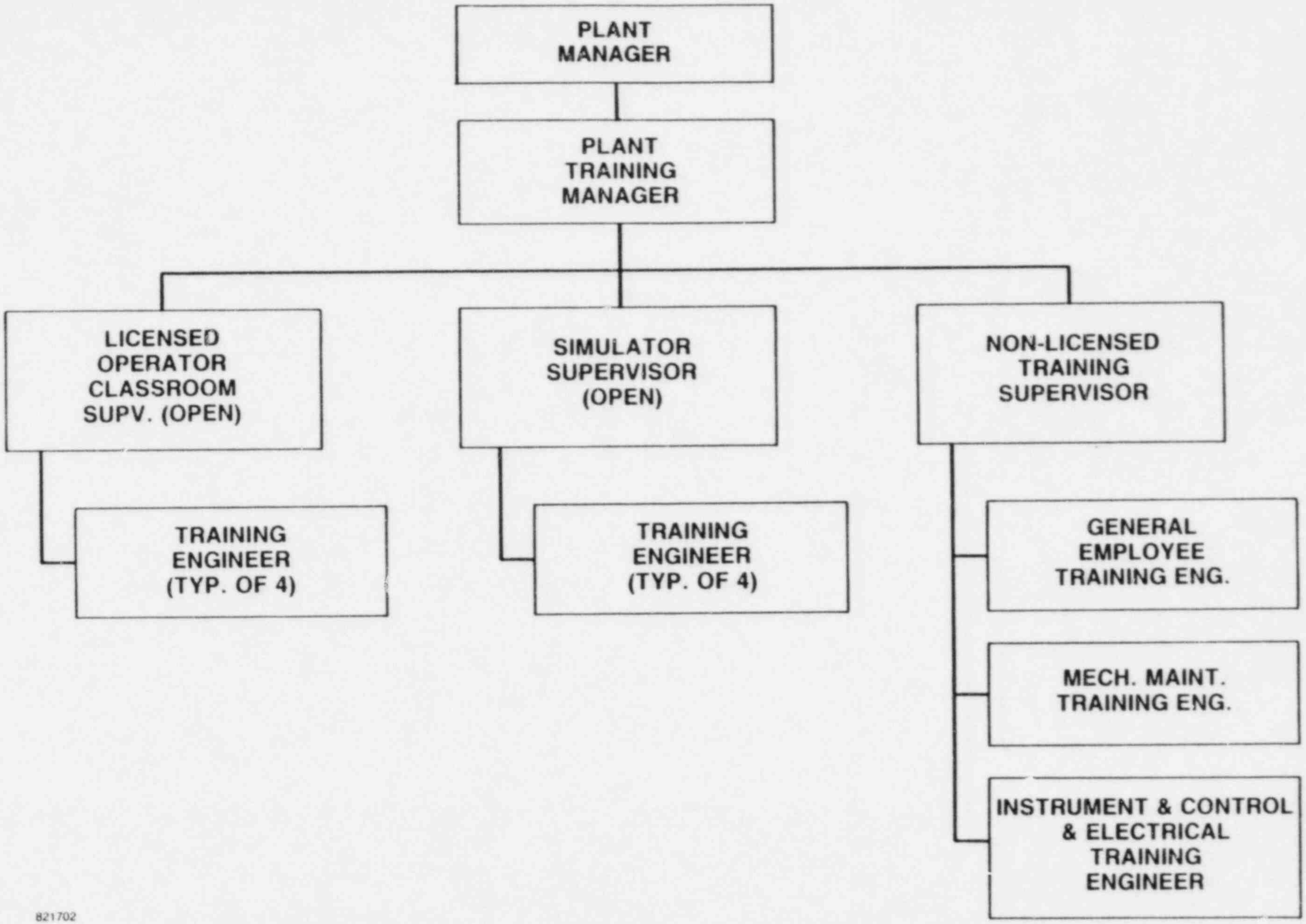
821541-5A

TRAINING PROGRAMS FOR STARTUP AND OPERATION OF WNP-2

- WNP-2 TRAINING DEPARTMENT ORGANIZATION
- PHILOSOPHY FOR PLANT STAFF TRAINING
- GENERAL EMPLOYEE TRAINING
- OPERATOR TRAINING
- TECHNICAL STAFF TRAINING
- MAINTENANCE TRAINING
- HEALTH PHYSICS/CHEMISTRY TRAINING
- TRAINING DEPARTMENT STAFF TRAINING
- STARTUP/TEST STAFF TRAINING

821636

WNP-2 TRAINING DEPT. ORGANIZATION



821702

PHILOSOPHY FOR PLANT STAFF TRAINING

DIRECTOR, POWER GENERATION

- **WNP-2 PLANT MANAGER**
  - **PLANT TRAINING DEPARTMENT**
- **MANAGER, GENERATION TRAINING**

DIRECTOR, SUPPORT SERVICES

- **MANAGER, HEALTH & SAFETY PROGRAMS**

PLANT TRAINING DEPARTMENT

- LICENSED OPERATOR SYSTEMS TRAINING
- SIMULATOR OPERATION, MODIFICATION & MAINTENANCE
- STA TRAINING
- STARTUP TRAINING
- MAINTENANCE TRAINING (JOURNEYMAN)
- REQUALIFICATION TRAINING
- NON-LICENSED OPERATOR TRAINING (PLANT SPECIFIC)
- HP/CHEMISTRY TRAINING
- GENERAL EMPLOYEE TRAINING

MANAGER, GENERATION TRAINING

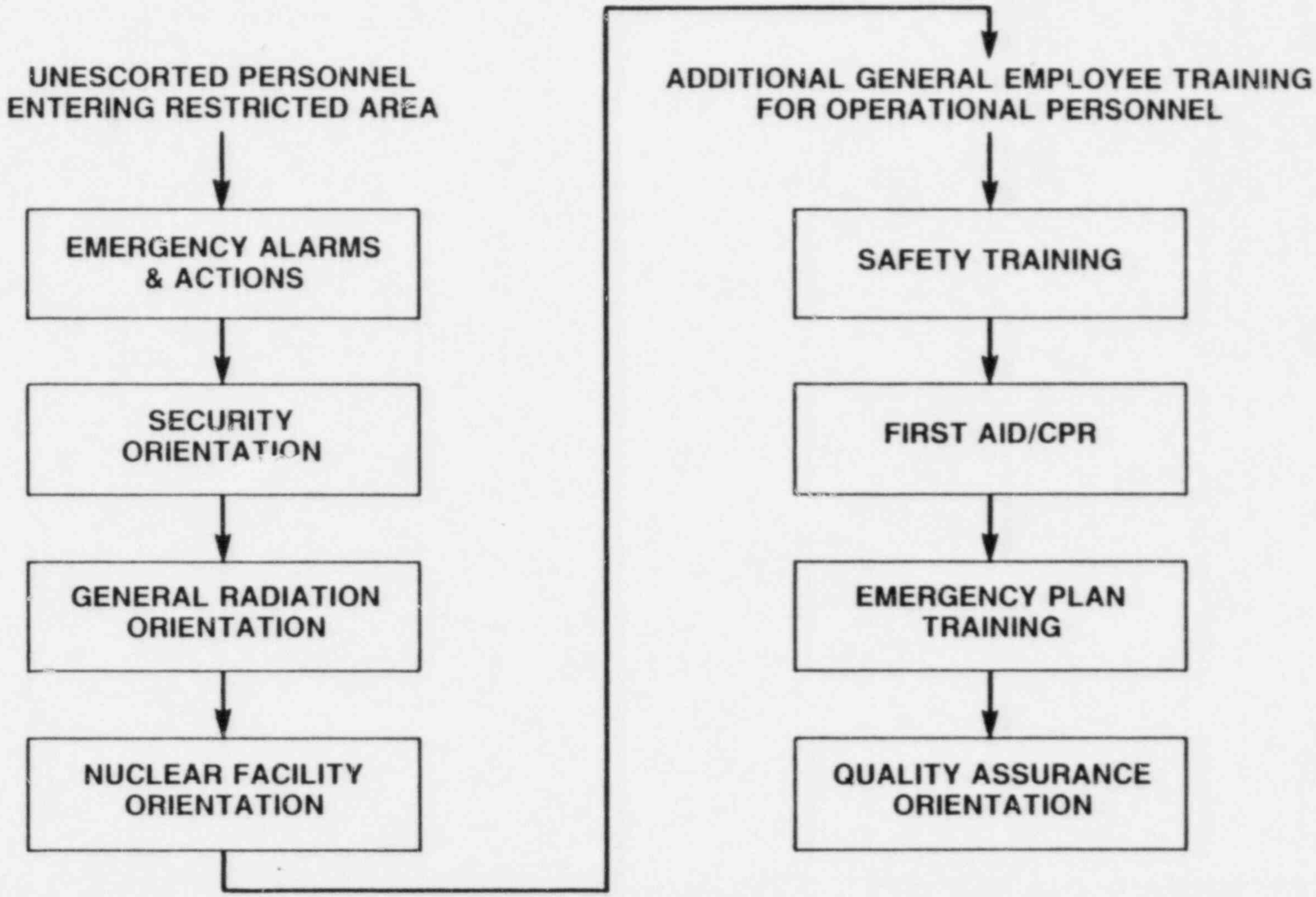
- LICENSED OPERATOR FUNDAMENTALS TRAINING
- COLLEGE TECHNOLOGY PROGRAM
- ACADEMIC UPGRADE
- IN-GRADE MAINTENANCE TRAINING
- NON-LICENSED OPERATOR TRAINING (ENTRY LEVEL)
- POWER PLANT PRINCIPLES
- RESEARCH REACTOR TRAINING

MANAGER, HEALTH & SAFETY PROGRAMS

- RADIOLOGICAL PROTECTION TRAINING
- EMERGENCY PLAN TRAINING
- SAFETY & FIRE PROTECTION TRAINING
- FIRST AID & CPR
- ALARA
- RESPIRATORY PROTECTION

821636

GENERAL EMPLOYEE TRAINING



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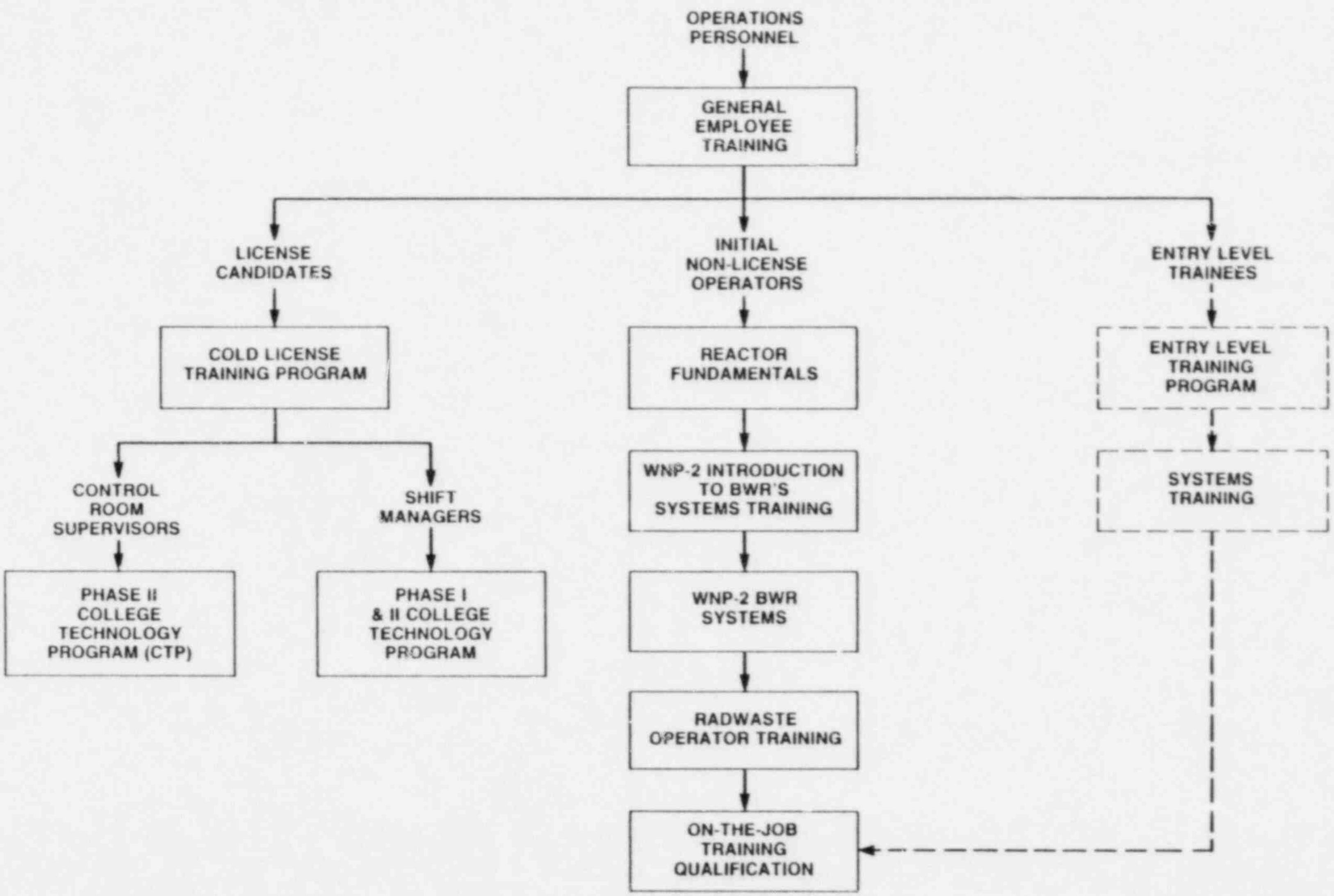
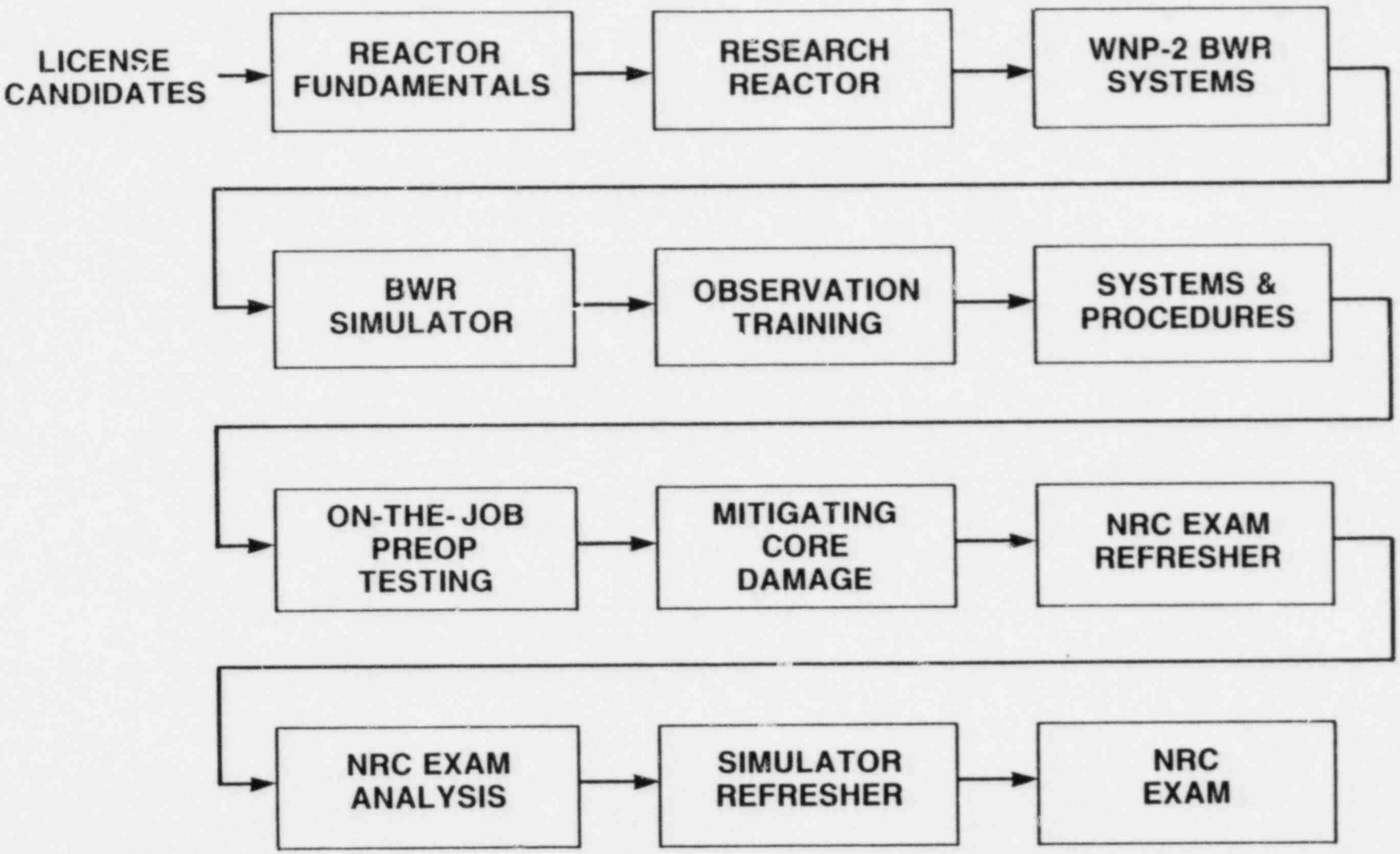
OPERATOR TRAINING



FULL COLD LICENSE TRAINING PROGRAM



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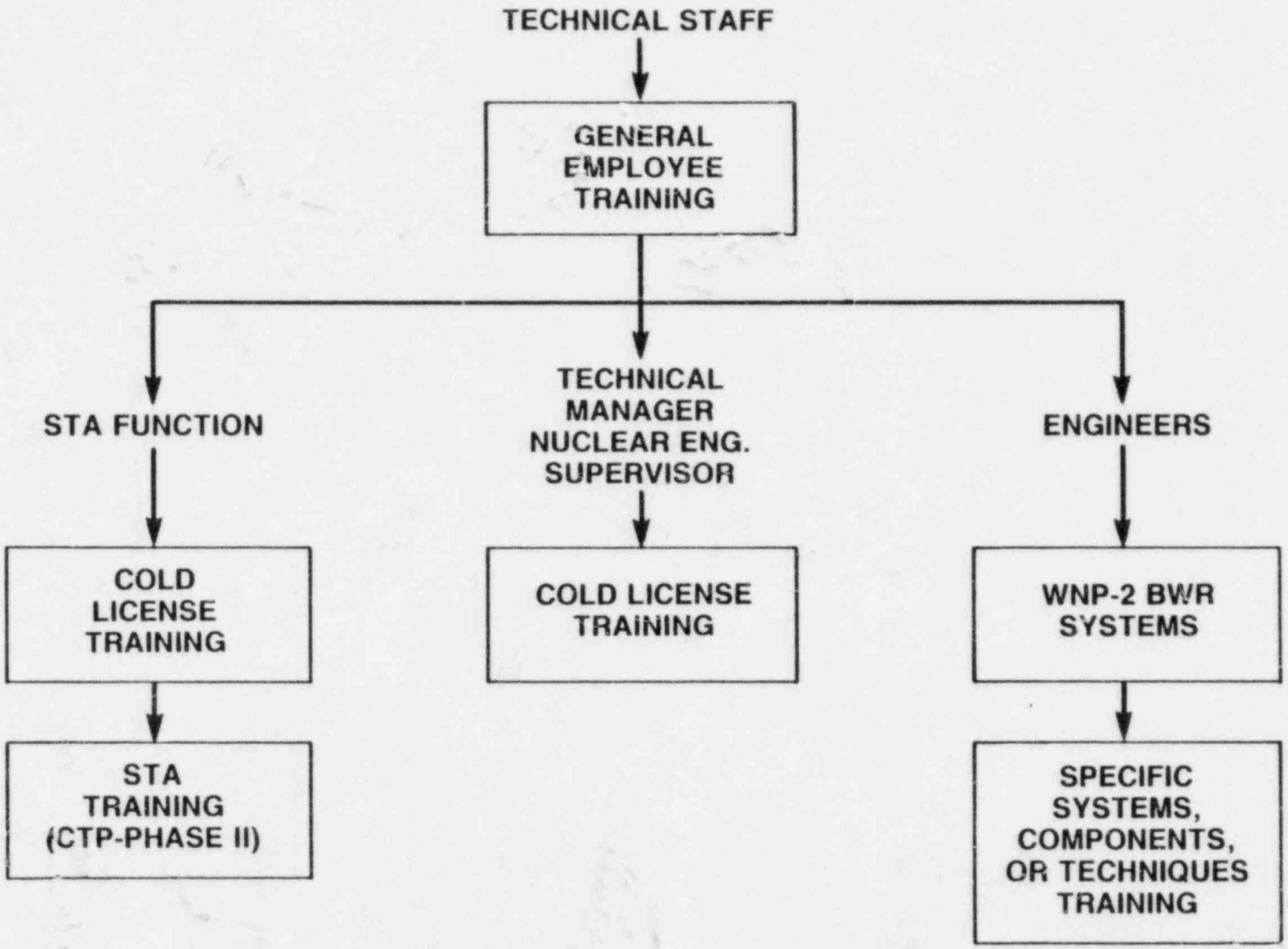
COLLEGE TECHNOLOGY PROGRAM (CTP)

PHASE I	PHASE II
MATHEMATICS (THRU DIFFERENTIAL & INTEGRAL CALCULUS)	BWR NUCLEAR ENGINEERING
GENERAL PHYSICS THERMO DYNAMICS HEAT TRANSFER FLUID MECHANICS	ABNORMAL EVENT ANALYSIS
INORGANIC CHEMISTRY	BWR CHEMISTRY & CORROSION
MATERIALS & FRACTURE MECHANICS	BWR MATERIALS
ELECTRICAL CIRCUIT THEORY	BWR PROCESS INSTRUMENTS
	BWR RADIOLOGICAL OCCURRENCES
	CONTROL ROOM MANAGEMENT

821636

PLANT TECHNICAL STAFF TRAINING



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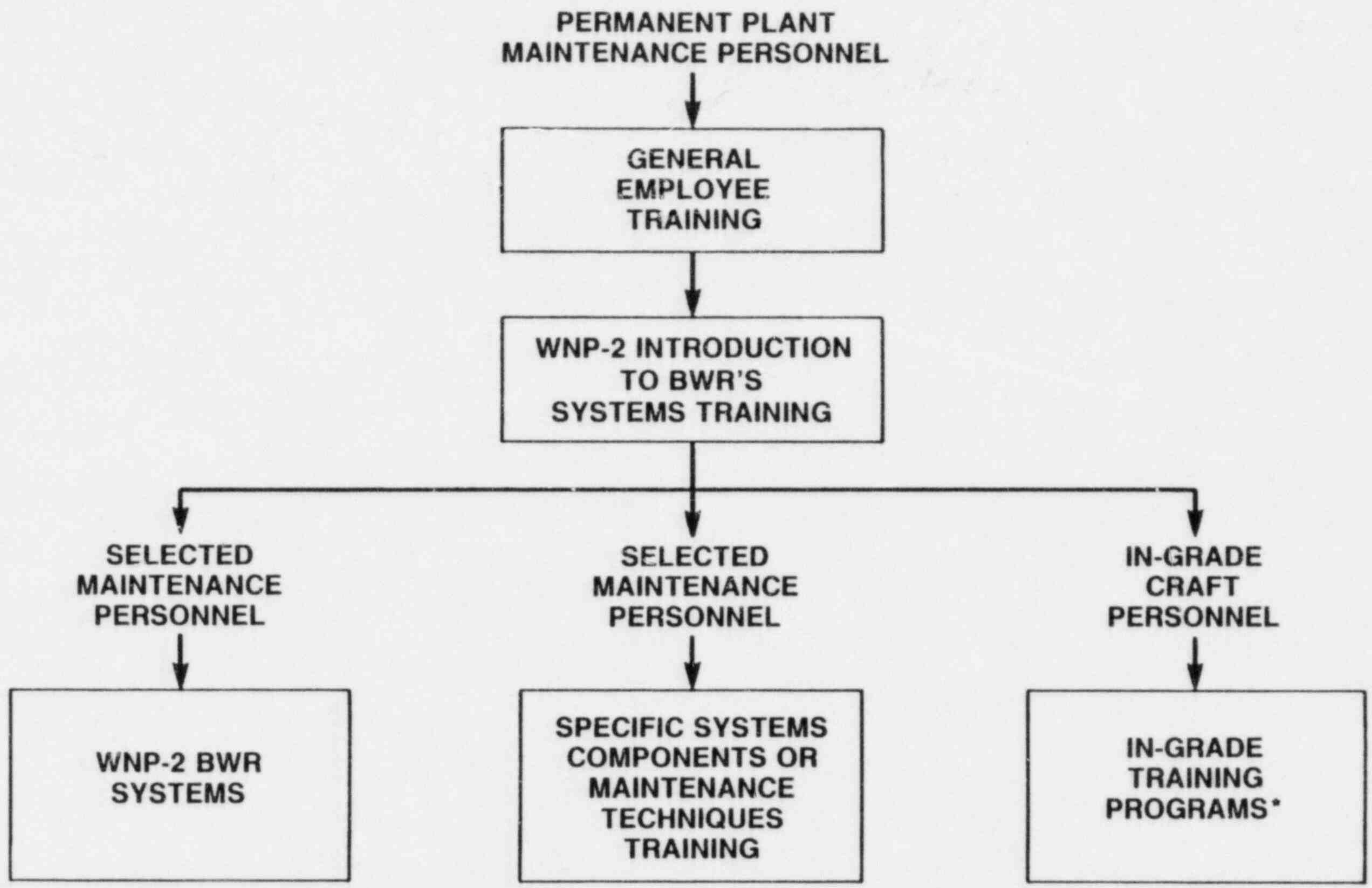
MAINTENANCE TRAINING



*INDIVIDUAL HOURS BASED ON EVALUATION OF QUALIFICATIONS

821636

HEALTH PHYSICS/CHEMISTRY STAFF TRAINING

HP/CHEMISTRY TECHNICIANS
IN-GRADE HP/CHEM TECHNICIANS

↓

GENERAL EMPLOYEE TRAINING

↓

WNP-2 INTRODUCTION TO BWR SYSTEMS TRAINING

↓

FORMAL EVALUATION OF QUALIFICATIONS

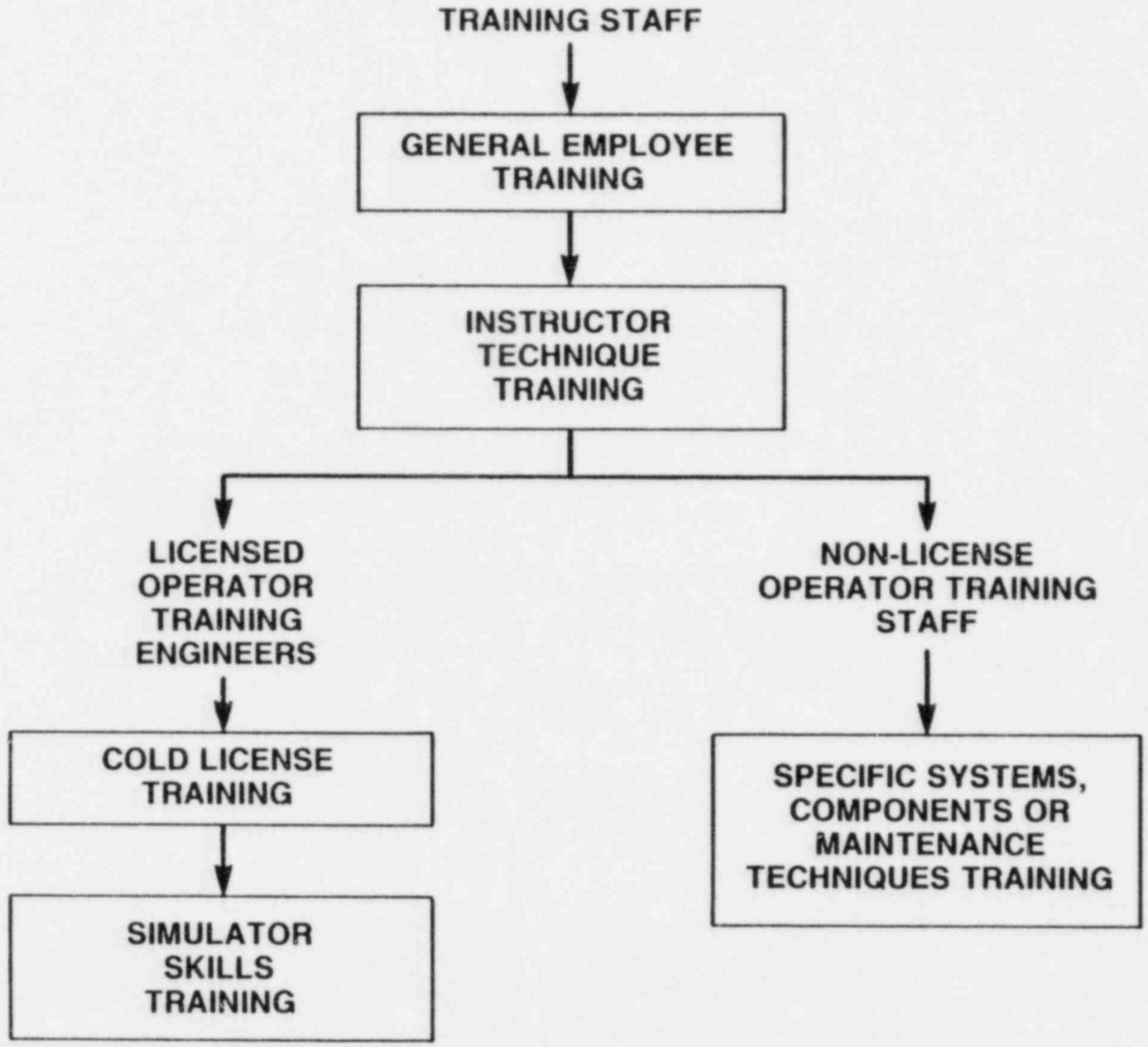
↓

HP/CHEM TECHNICIAN IN-GRADE PROGRAM*

*INDIVIDUAL HOURS BASED ON EVALUATION OF QUALIFICATIONS

821636

PLANT TRAINING DEPARTMENT
STAFF TRAINING



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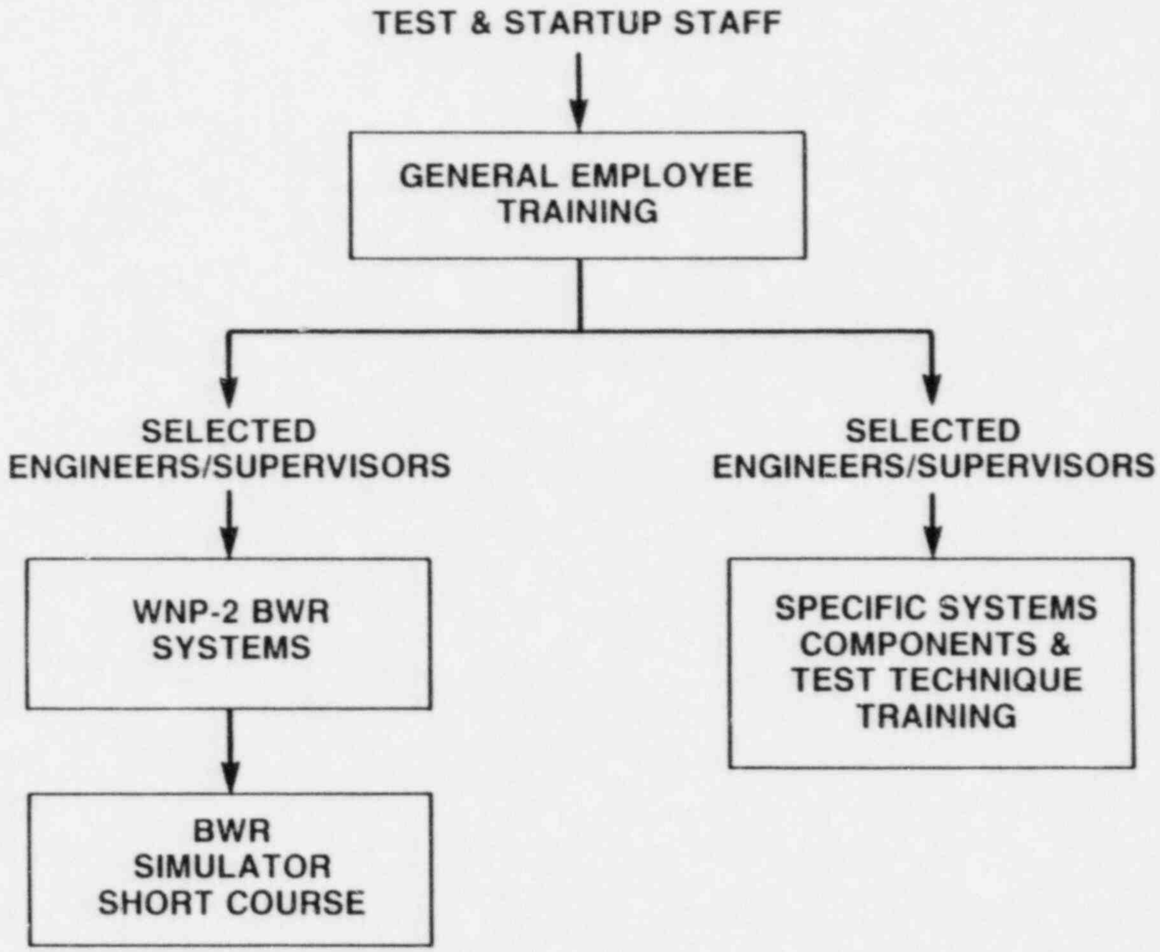
STARTUP/TEST STAFF TRAINING



821636

WNP-2 SIMULATOR STATUS

- PLANT SPECIFIC SIMULATOR ORDERED IN SEPTEMBER 1980
- SCHEDULED FOR USE BY APRIL 1983
- TRAINING PROGRAMS CURRENTLY UNDER DEVELOPMENT
  - EXAM REFRESHER TRAINING
  - HOT LICENSE TRAINING
  - RETRAINING ON 6 WEEK CYCLE

SUPPLY SYSTEM TRAINING COMMITMENT

THE SUPPLY SYSTEM IS FIRMLY COMMITTED TO PROVIDING A VIGOROUS AND EFFECTIVE TRAINING PROGRAM. EXAMPLES OF THIS INCLUDE:

- EACH TYPE OF PLANT WILL HAVE A PLANT SPECIFIC SIMULATOR.
- A COLLEGE TECHNOLOGY PROGRAM IS IN PLACE TO IMPROVE THE ANALYTICAL SKILLS OF THE SHIFT MANAGERS & CONTROL ROOM SUPERVISORS.
- SHIFT TECHNICAL ADVISORS ARE ATTENDING THE COLD LICENSE TRAINING PROGRAM AS WELL AS STA TRAINING.
- THE TEST & STARTUP STAFF HAVE PARTICIPATED IN MANY ELEMENTS OF THE COLD LICENSE TRAINING PROGRAM INCLUDING EXTENSIVE SYSTEMS TRAINING & SIMULATOR TRAINING
- SEVERAL SUPPLY SYSTEM COURSES HAVE BEEN EVALUATED BY THE NEW YORK STATE REGENTS AND RECOMMENDED FOR COLLEGE LEVEL CREDIT.
- R. L. FERGUSON LETTER TO E. P. WILKINSON, PRESIDENT OF INPO, DATED AUGUST 6, 1982 TO INITIATE PROCESS THAT WILL RESULT IN ACCREDITATION OF OUR TRAINING PROGRAMS.

821636

SUMMARY

- WELL STAFFED OPERATING ORGANIZATION (STAFFING NEARLY COMPLETE)
- OPERATING STAFF HAS EXTENSIVE NUCLEAR EXPERIENCE (INCLUDING COMMERCIAL BWR EXPERIENCE)
- COMPREHENSIVE TRAINING PROGRAMS PROVIDED FOR PLANT AND PLANT SUPPORT STAFF

EMERGENCY PLANNING

J. V. EVERETT

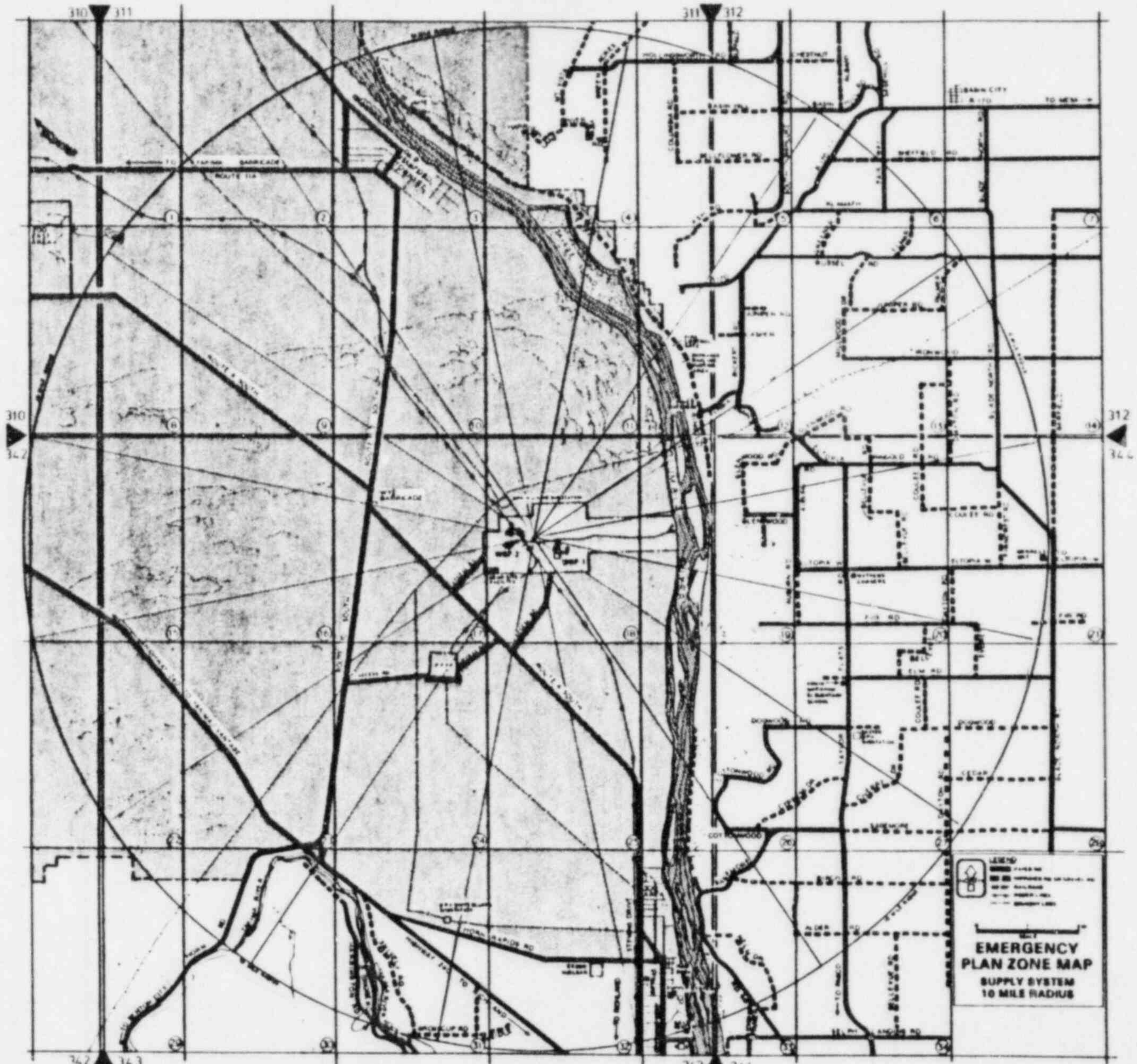
MANAGER,
EMERGENCY PREPAREDNESS

EMERGENCY PREPAREDNESS PRESENTATION

1) 10 mile Emergency Planning Zone (EPZ)
2) 50 mile Emergency Planning Zone (EPZ)
3) Emergency Organization
4) Response Organization
5) Emergency Centers
6) Communications
7) Early Warning System
8) Public Relations

82839-3A

TEN MILE EMERGENCY PLANNING ZONE



HANFORD RESERVATION

WNP 1, 2

82754

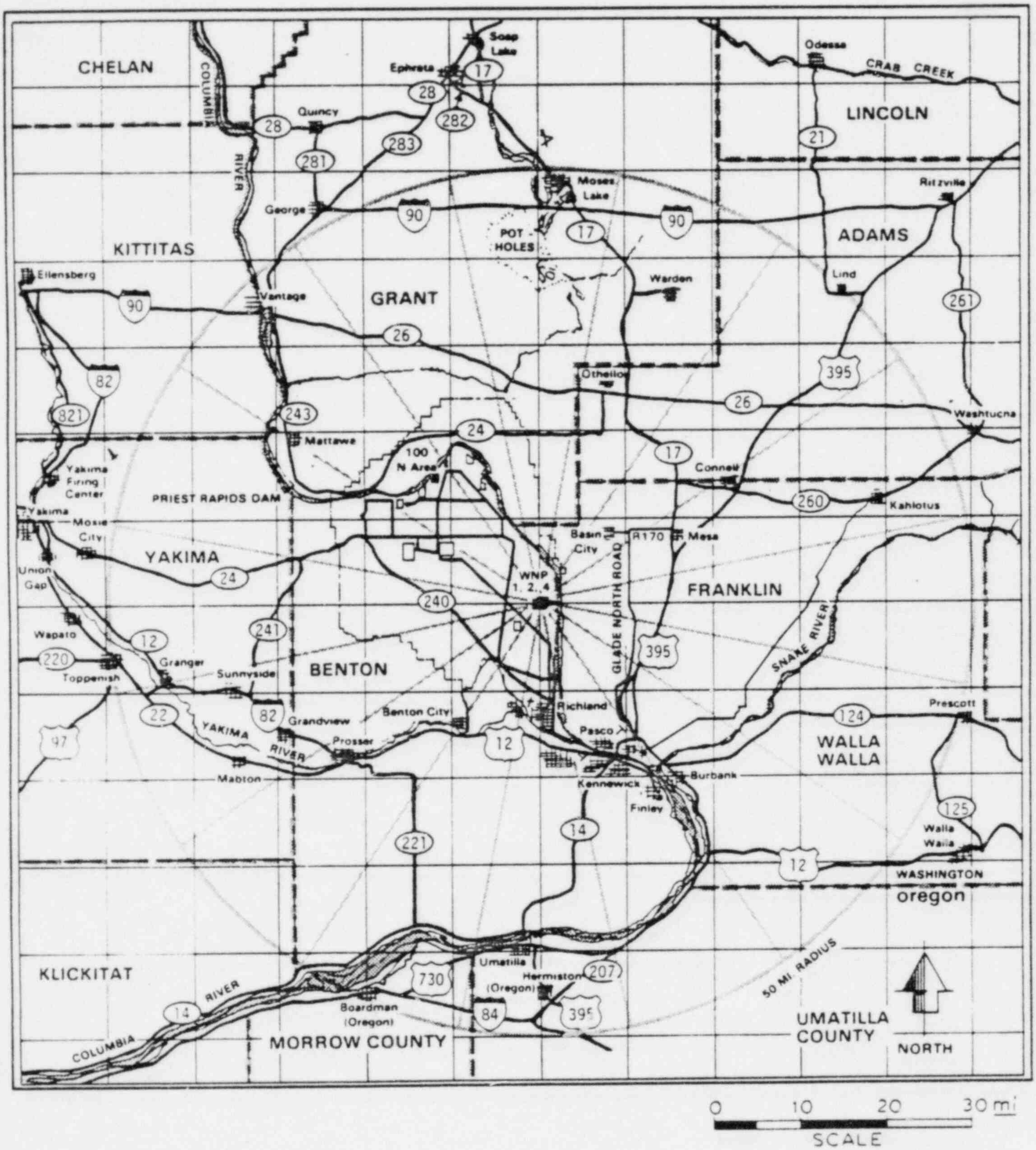
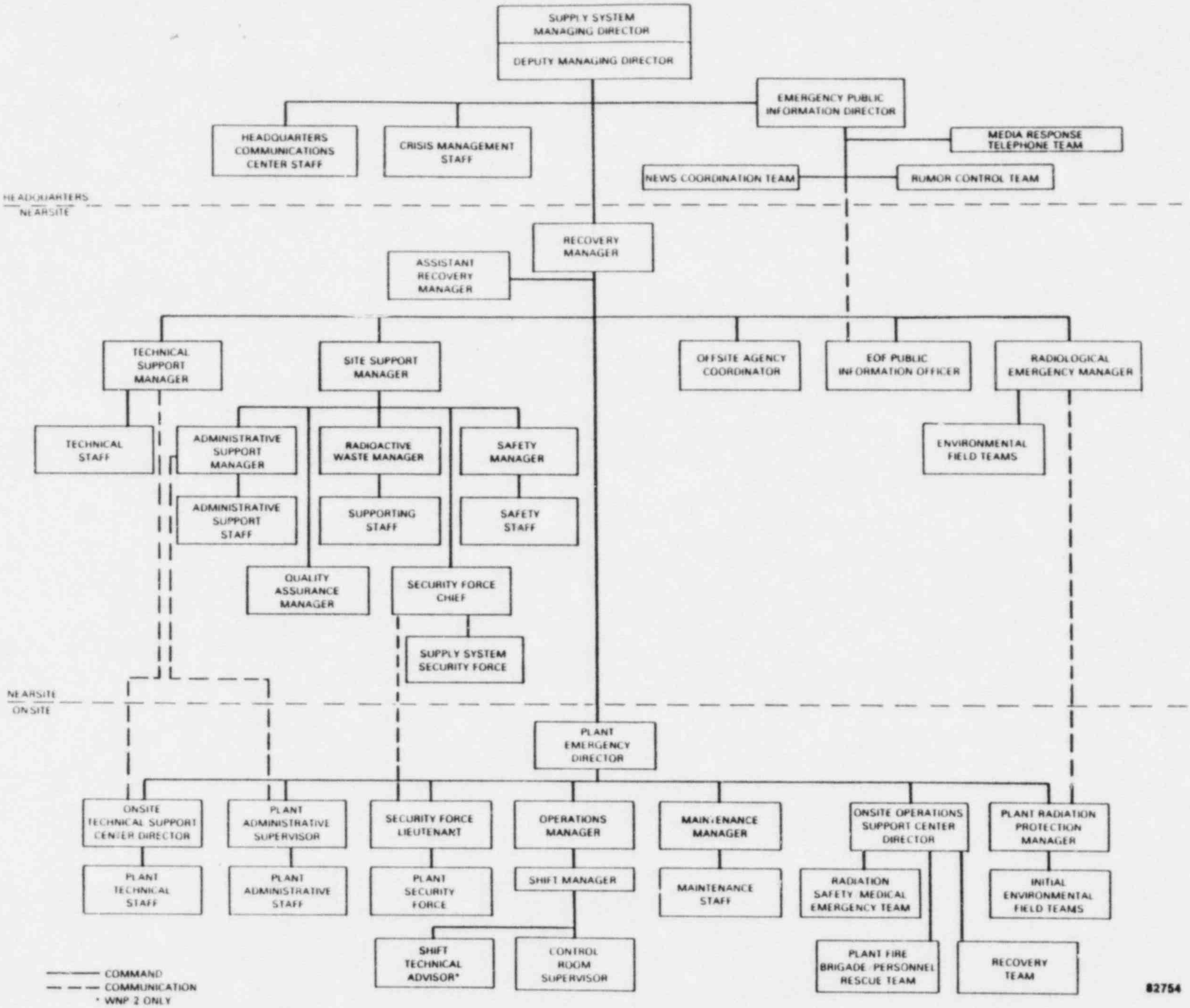
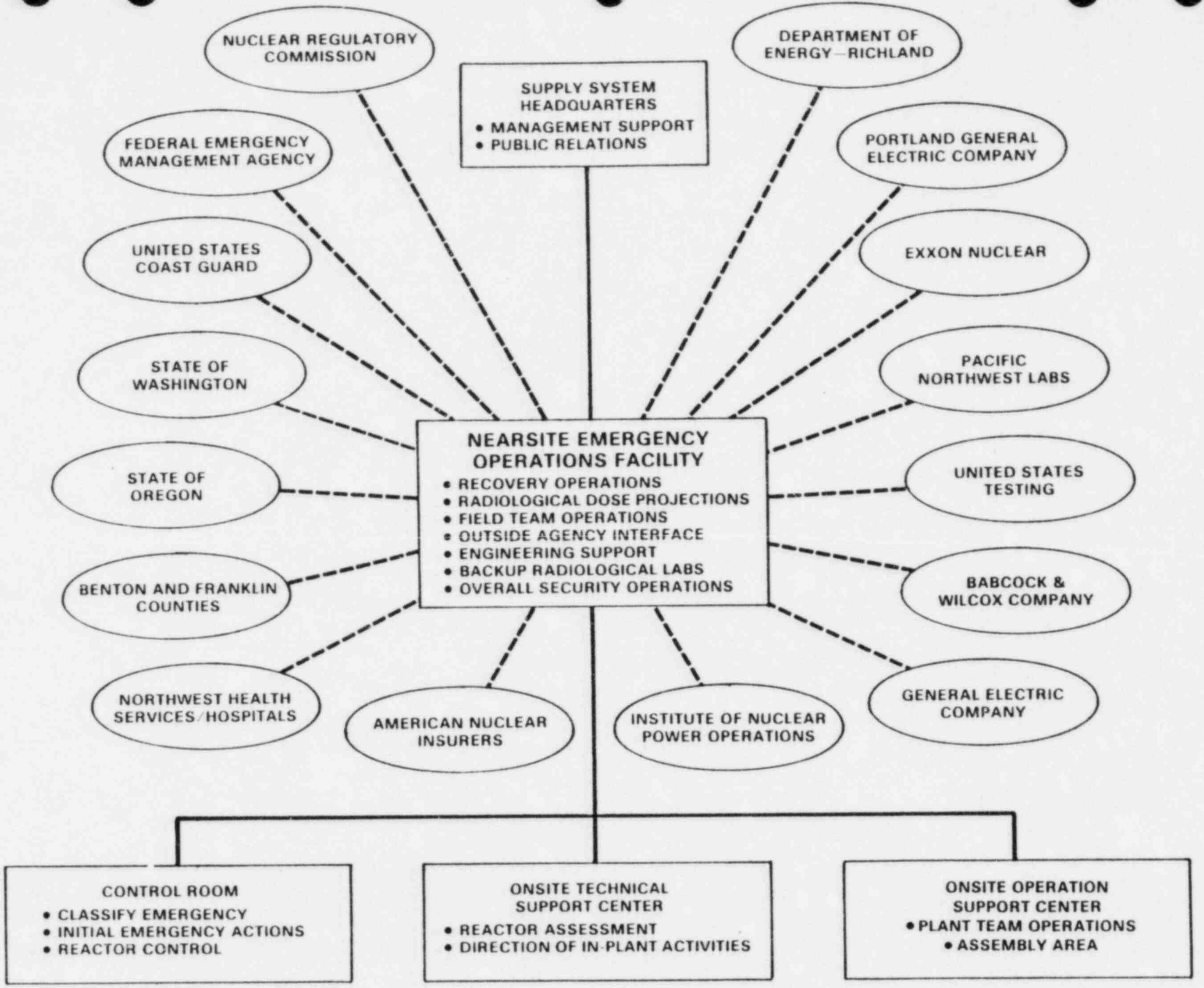


FIGURE 1-2. 50 MILE EMERGENCY PLANNING ZONE

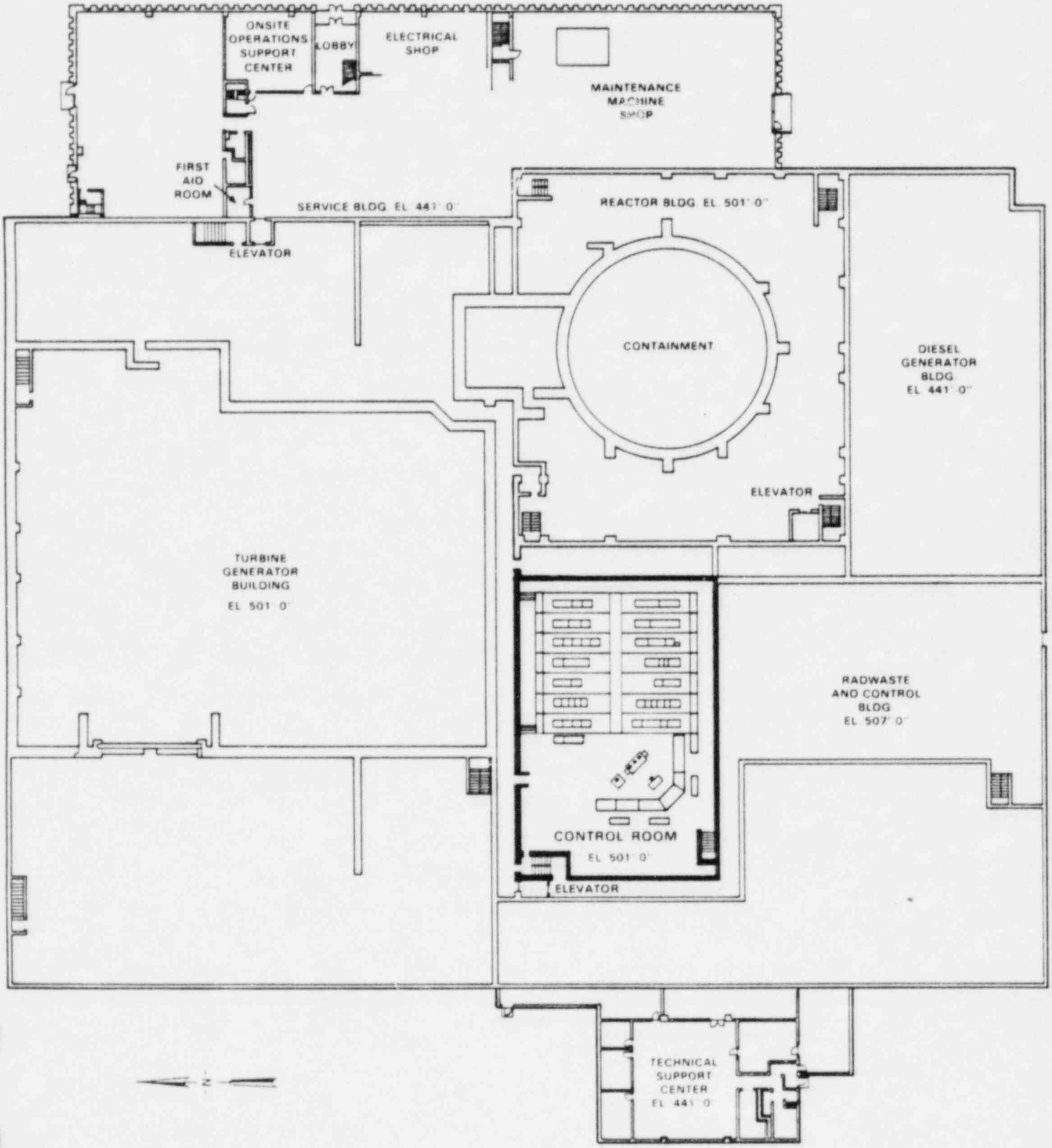
OVERALL EMERGENCY ORGANIZATION



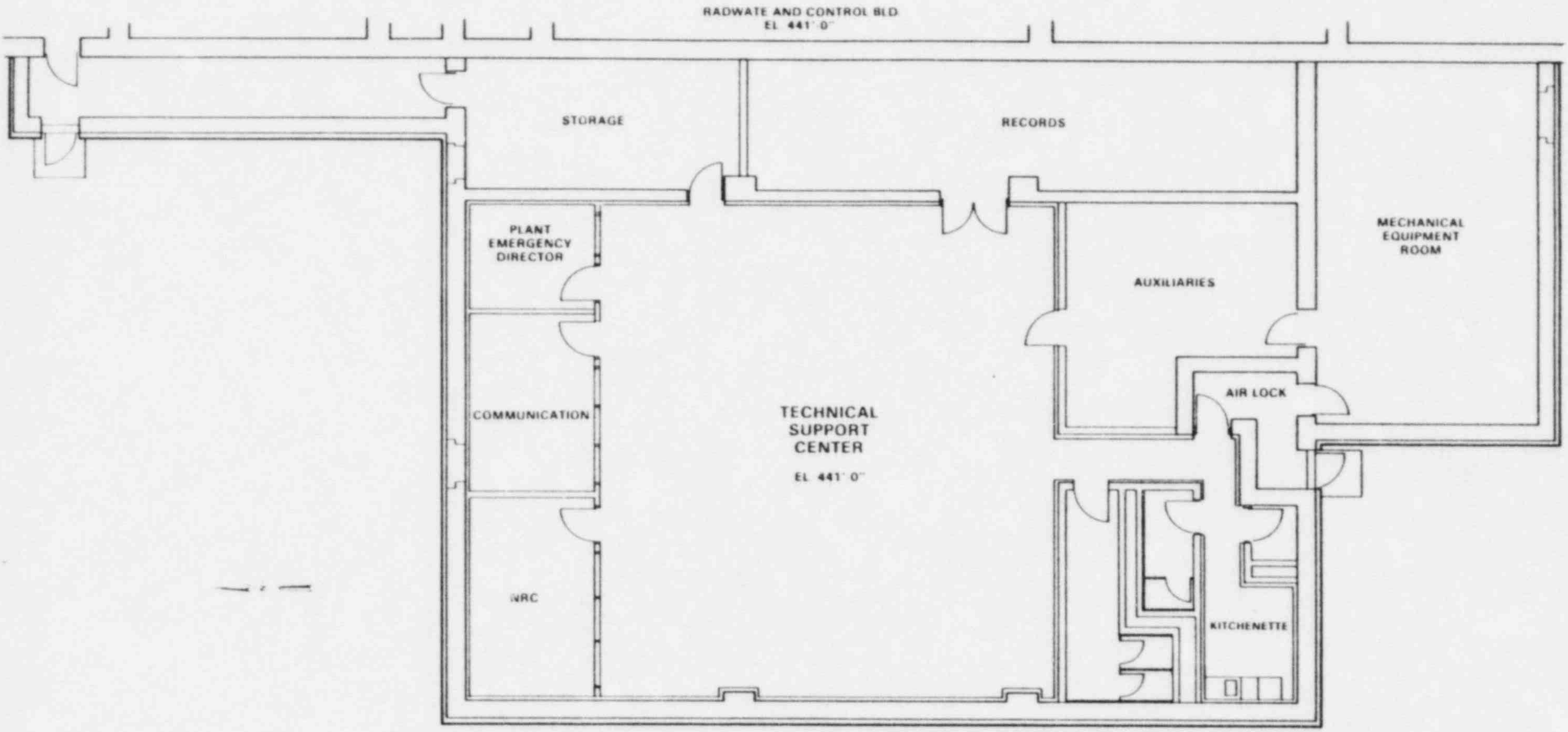


EMERGENCY RESPONSE ORGANIZATIONS

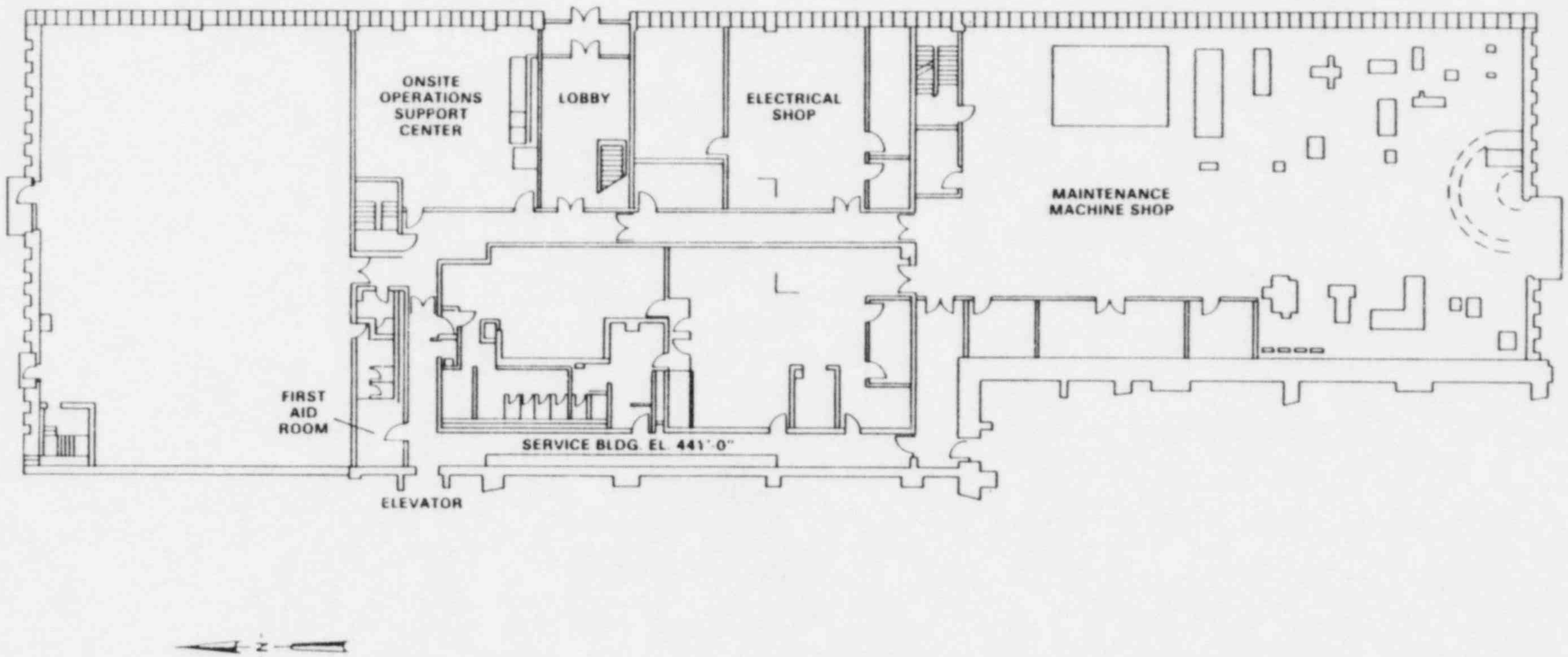
8102014



WNP-2 CONTROL ROOM LOCATION

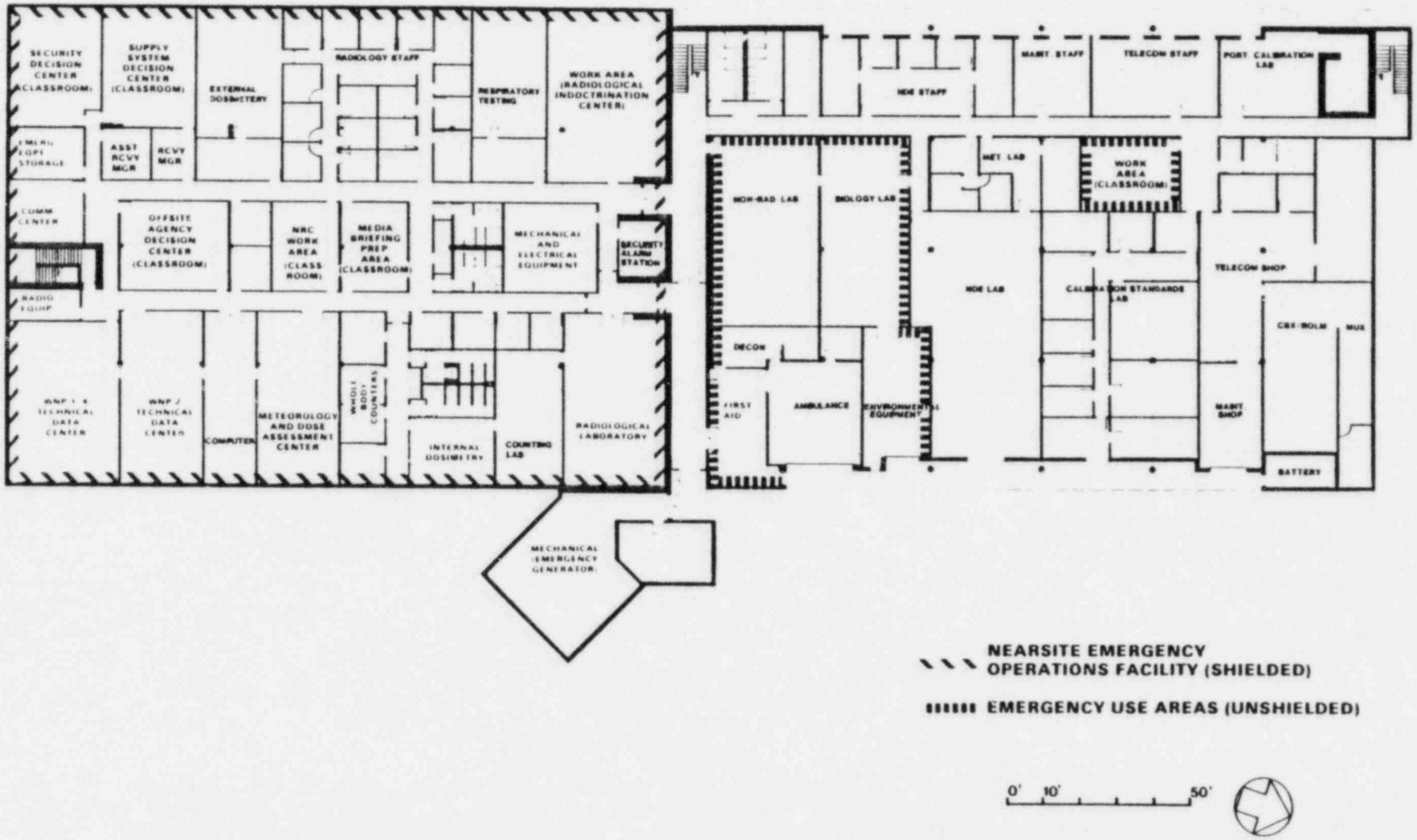


WNP-2 TECHNICAL SUPPORT CENTER



WNP-2 OPERATIONS SUPPORT CENTER

PLANT SUPPORT FACILITY
FIRST FLOOR PLAN



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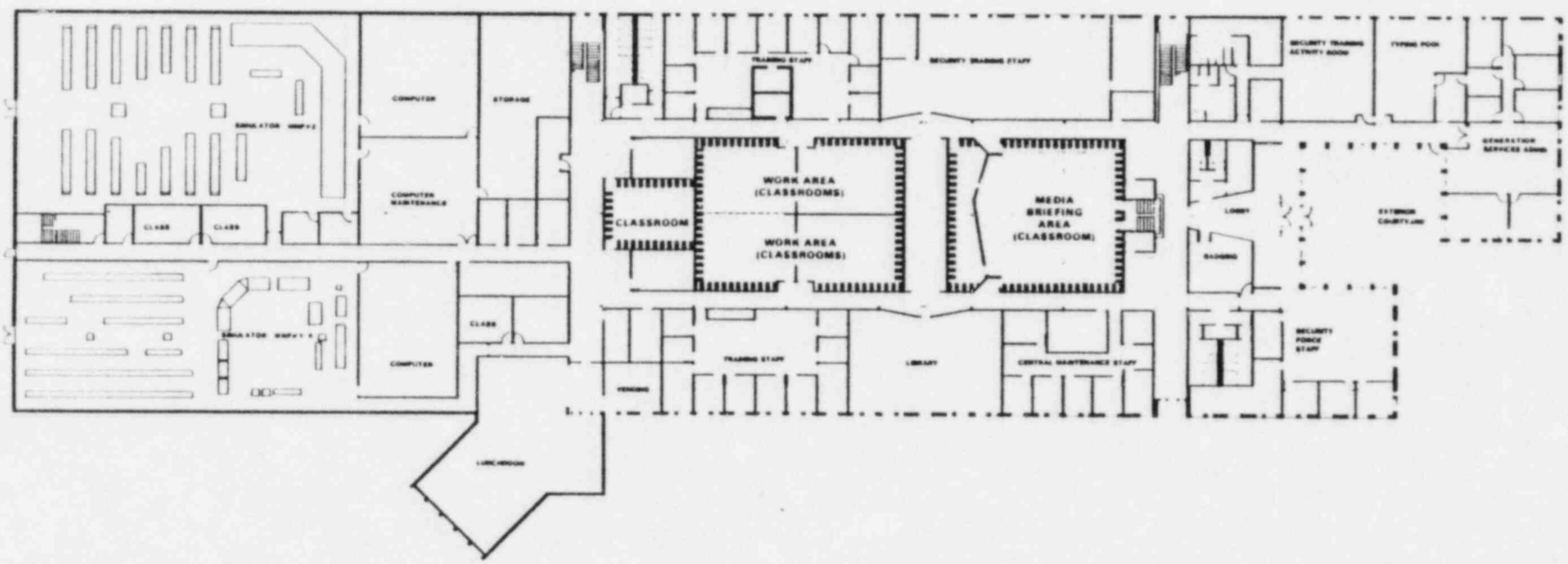
PLANT SUPPORT FACILITY
SECOND FLOOR PLAN



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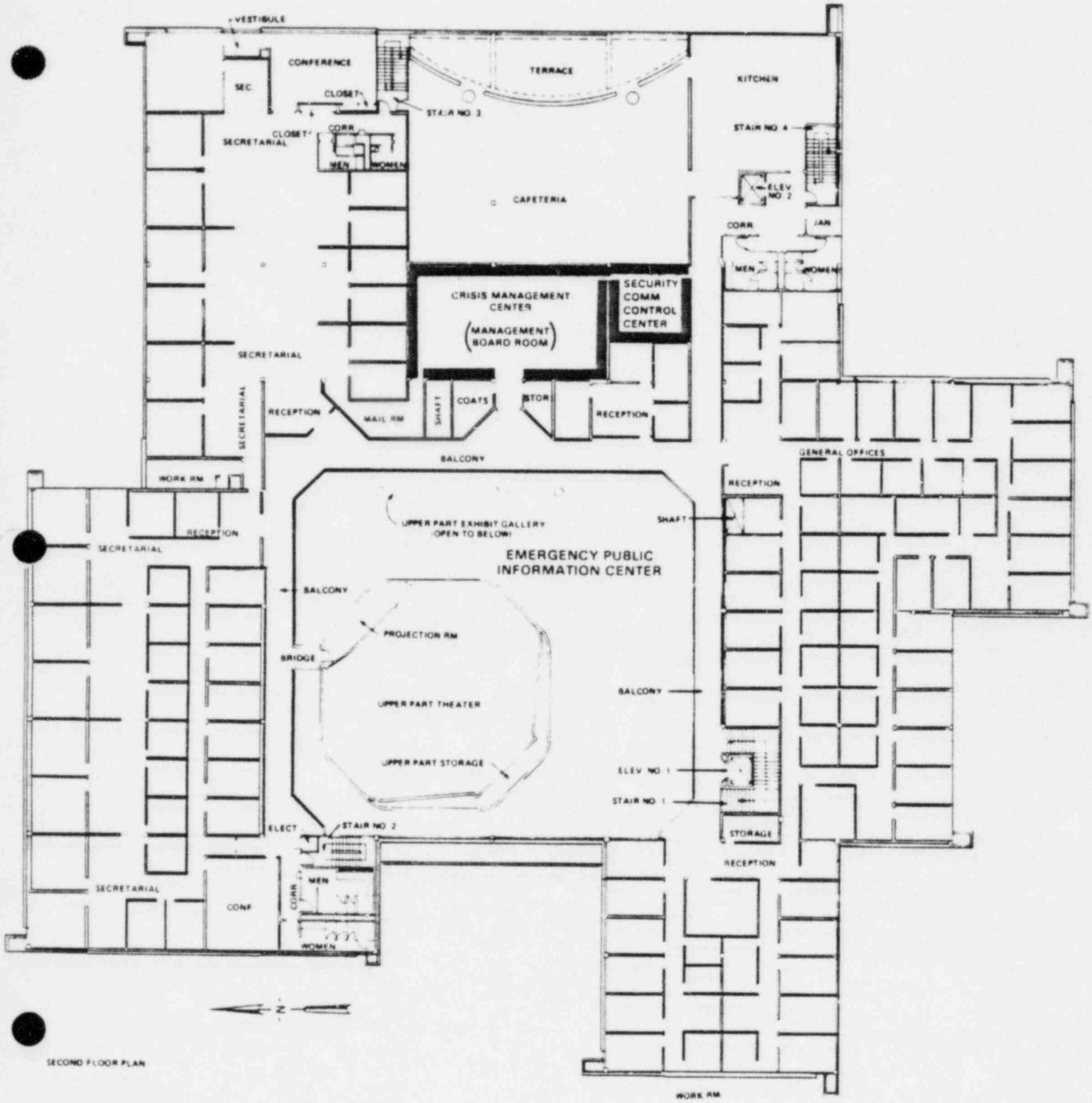
MULTIPURPOSE FACILITY
(FIRST FLOOR)



MULTIPURPOSE FACILITY
(SECOND FLOOR)

EMERGENCY COMMUNICATION NETWORKS

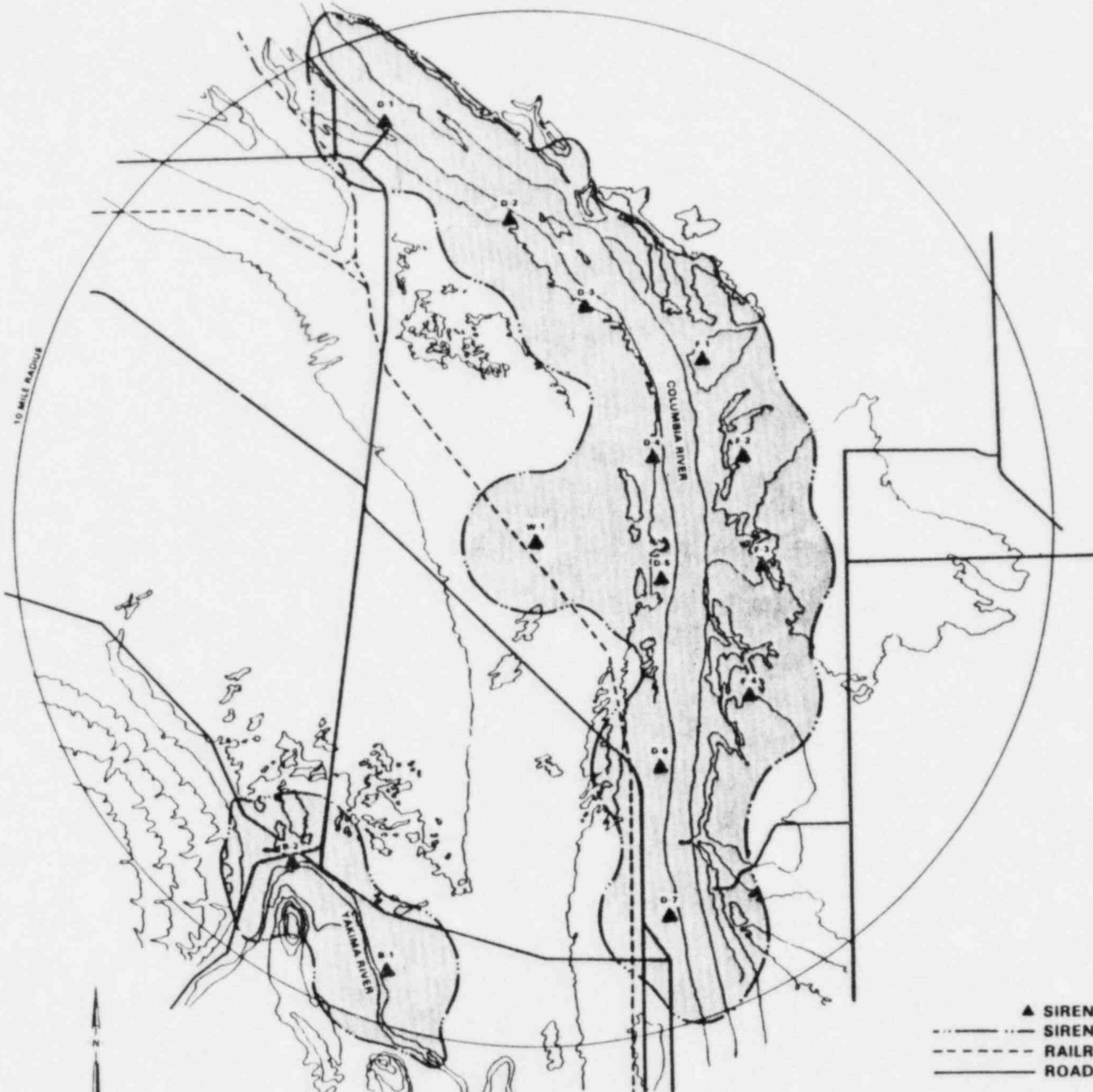
- Radio
- Dedicated Phones
- Crash Network
- Facsimile

82754

EARLY WARNING SYSTEM

- Sirens for Transient Areas
- Tone Activated Radios for Residents
- 1300 Residents in 10 mile EPZ

SIREN COVERAGE



▲ SIRENS
-··-——-··- SIREN COVERAGE
– – – – – – RAILROAD TRACK
———— ROAD

82754

PUBLIC INFORMATION

- Annual Program
  - Brochure
  - Media
- Speakers Bureau
- Visitors Center
- Emergency Operations
  - Joint Press Center
  - Rumor Control

82839 1A

ADVANTAGES OF HANFORD SITE FOR EMERGENCY PLANNING

- LONG HISTORY OF NUCLEAR OPERATIONS
- LARGE POOL OF TECHNICAL PERSONNEL AND RESOURCES
- LOW POPULATION IN PLANNING ZONE
- LOCAL ACCEPTANCE AND UNDERSTANDING OF NUCLEAR OPERATIONS
- ACTIVE DOE EMERGENCY PREPAREDNESS PROGRAMS

821760-1A

ADVANTAGES OF SUPPLY SYSTEM ORGANIZATION

- NUCLEAR ORIENTED COMPANY
- STRONG UPPER MANAGEMENT SUPPORT FOR SAFETY
- CORPORATE OFFICES NEAR THE PLANTS

821760-2A

GEOLOGY & SEISMIC ISSUES

D. L. RENBERGER

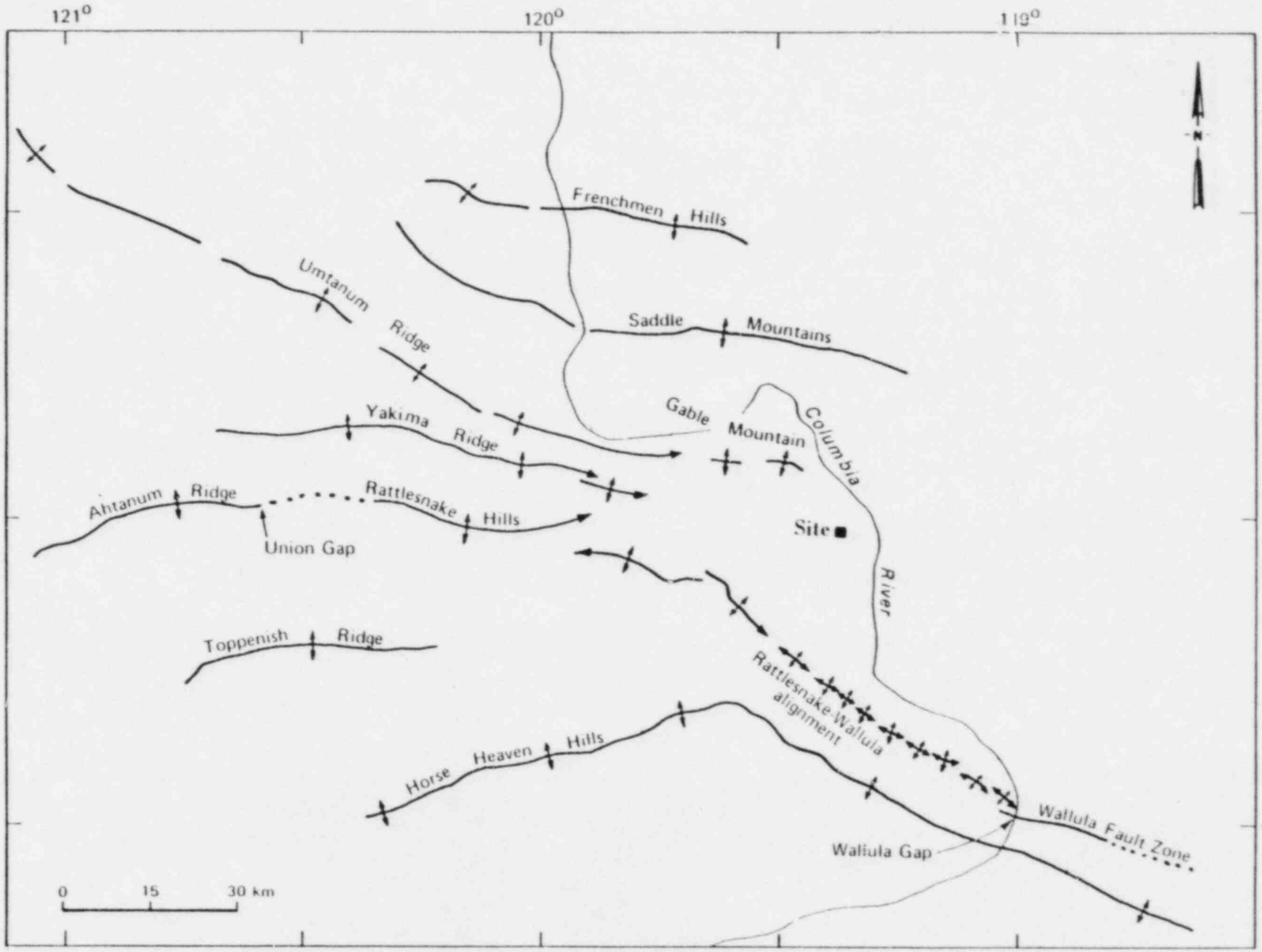
DEPUTY DIRECTOR,
TECHNOLOGY

821702

GEOLOGY/SEISMOLOGY

- REGIONAL AND SITE GEOLOGY
- CP LICENSING BASIS
- NEW INFORMATION
- OL LICENSING BASIS

CENTRAL COLUMBIA PLATEAU STRUCTURES



	APPROXIMATE DEPTH FEET	APPROXIMATE AGE MYBP
GRAVELS	60	RECENT
CEMENTED SILTS, SANDS & GRAVELS	400	3
BASALT	100	10
SEDIMENTS	20	
BASALT	100	12
SEDIMENTS	20	
BASALTS	—	—
SEDIMENTS		

12 MAJOR FLOWS

CENTRAL COLUMBIA PLATEAU STRATIGRAPHY

LICENSING ACTIONS

1973 -	CP ISSUED
1973 - 1975	INVESTIGATIONS FOR WNP-1 CP (ISSUED 1975)
1975 - 1977	1872 EARTHQUAKE STUDIES AND WNP-4 CP (ISSUED 1978)
1982	WNP-2 OL-SSER AUGUST 1982

821541-12A

CP LICENSING BASIS

- LARGEST HISTORICAL EARTHQUAKE
  INTENSITY (MM) VII
- ASSUME RATTLESNAKE CAPABLE
- FOR CONSERVATISM INCREASE TO INTENSITY (MM) VIII
- DESIGN BASIS 0.25g ZPA WITH APPROPRIATE RESPONSE SPECTRUM

SUMMARY OF NEW DATA

MAPPING/TRENCHING ON SIGNIFICANT GEOLOGIC STRUCTURES

BORINGS

MAGNETICS/GRAVITY

REFRACTION/REFLECTION SURVEYS

REMOTE SENSING

GEODETIC MEASUREMENTS

ADDITIONAL SEISMIC RECORDINGS

NEW EVALUATION OF HISTORIC SEISMIC RECORDS

OL LICENSING BASIS

LARGEST HISTORICAL EARTHQUAKE

VII 1936 MILTON-FREEWATER EVENT; MAGNITUDE 5¾

NEAREST CAPABLE FAULT

CENTRAL FAULT, GABLE MOUNTAIN; MAGNITUDE 5

SSE STRUCTURE

RATTLESNAKE-WALLULA; MAGNITUDE 6.5

SMALL MAGNITUDE EARTHQUAKES

MAXIMUM MAGNITUDE M 3

GROUND MOTION CALCULATED FOR A MAGNITUDE 4

SITE SPECIFIC RESPONSE SPECTRUM

MAGNITUDE 6.1 AT RANDOM DISTANCES

PROBABILITY

1.1×10^{-4} ANNUAL PROBABILITY OF 0.25g EXCEEDANCE

821541-13A

CONCLUSIONS

- Original SSE of .25g confirmed adequate and conservative by:
  - Estimation of maximum magnitude on nearby potential source structures
  - Site specific response spectra based on a conservative estimate of the largest historic earthquake
  - Evaluation of small magnitude earthquakes in close proximity to site
  - Probabilistic evaluation of exceeding SSE considering potential sources within 50 km
- There are no open items

EQUIPMENT QUALIFICATION

J. E. RHOADS

PROGRAM MANAGER,
EQUIPMENT QUALIFICATION

OBJECTIVES

1. Confirm that WNP-2's safety related equipment can perform its safety function under all postulated accident and seismic conditions. Where documentation is deficient to establish this confirmation, take the necessary corrective action.

2. Meet the reasonable & technically justifiable concerns raised by NRC.

3. Meet these concerns with an aggressive, cost-effective program that minimizes the impact to plant completion.

4. Establish the resource & expertise within the Supply System to carry on the work throughout plant life.

REQUIREMENT

1. All safety-related electrical equipment shall be qualified to the requirements of NUREG 0588 by 4 months prior to full power operation. All non-qualified items to be dispositioned (in test, in analysis, being replaced, etc.) by audit.

2. All safety-related electrical and mechanical equipment shall be qualified to SQRT requirements (including seismic and hydrodynamic loads) by fuel load, with 85% qualified and installed by audit.

821141-2A

EXPECTED MODIFICATION

1. NUREG 0588 limited to harsh areas only and schedule extended to no later than November 30, 1985, with justification for interim operation approved by NRC. Rule making on this in 1982.
2. Seismic requirement rule making expected in 1982.
3. Mild area safety-related electrical equipment qualification guidelines to be issued in 1982.

821141-1A

PROJECT HISTORY/QUALIFICATION REQUIREMENTS
WNP-2

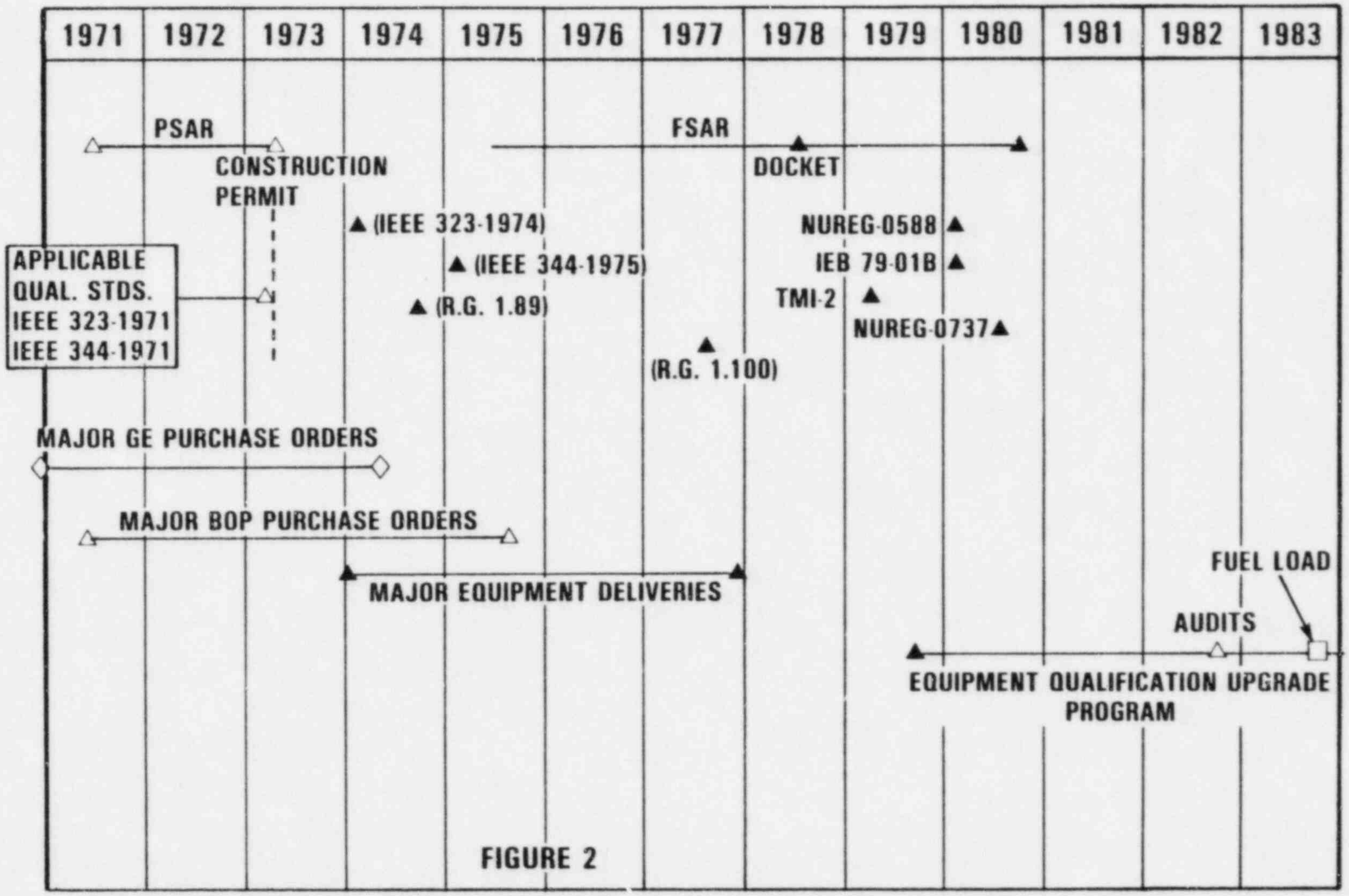


FIGURE 2

82777 2A

SUPPLY SYSTEM EQUIPMENT QUALIFICATION ORGANIZATION

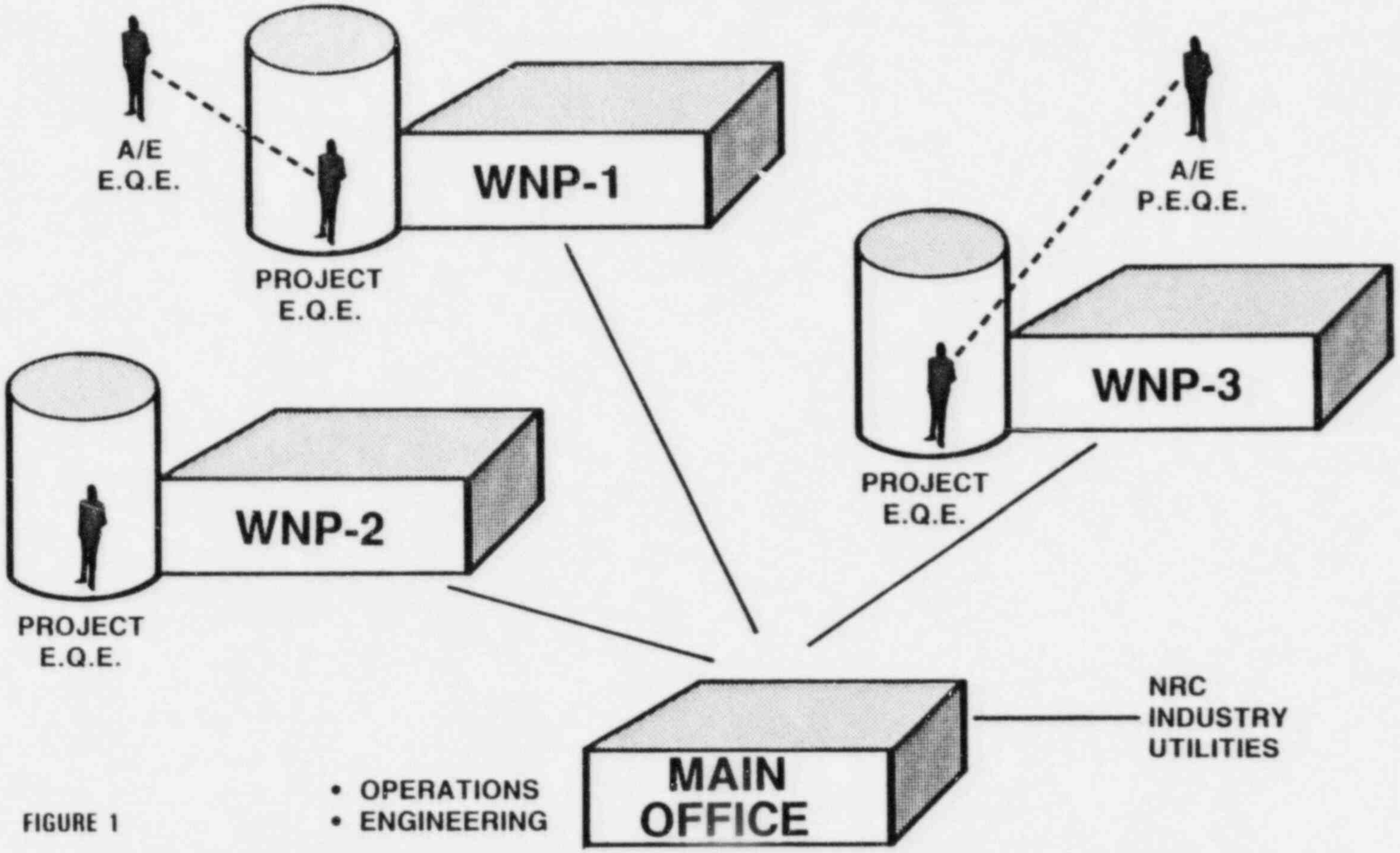


FIGURE 1

Establishing the Evaluation Criteria

1. Disagreed with NUREG 0588
2. Establish EPRI programs to address technical issues
   a) Equipment qualification data bank
   b) Aging-seismic link studies
   c) State of the art - aging technology
   d) Literature search - radiation effect
   e) Mild environment
   f) Hydrogen burn survial tests
3. AIF workshops to address areas of disagreement
4. Addressing the legal aspects (Nuclear Utility Group on E.Q.)

Establishing the Evaluation Criteria

AIF Workshops

1. Schedule
2. Mild environment equipment qualification
3. Replacement parts
4. Pre-aging before seismic testing
5. Aging - harsh environments
6. One hour time margin
7. Test facilities accreditation
8. Surveillance and maintenance
9. Radiation considerations
10. System operating times
11. Margins
12. Containment profile
13. Independent verification testing

82777-18A

Establishing Accident Environmental Criteria

(original basis was generic specification)

1. Radiation (inside & outside containment)
2. High energy line breaks (outside containment)
3. LOCA & MSLB (inside containment)
4. LOCA & MSLB effects in secondary containment (BWR)
5. Flooding (inside and outside containment)

82777.15A

Establishing the Basis

- List of equipment
  - — Harsh areas - primary focus
    1) Tag numbers - including components
    2) Manufacture, model number
    3) Safety function
    4) Plant location
    5) Time duration of operation during accident(s)

Finding Documentation

1. A/E Files
2. Vendor Contacts
3. Utility Sharing

Performing the Evaluation

1. Supply System equipment qualification staff. (8 Engineers, 2 Record Analysts)

2. Supplement where needed by consultant working under direction from Supply System engineers.

On-Site: 3 Engineers - Consultant

Off-Site: Analysis Support
GE
EDS
CYCNA
NUTECH

Implementing the Corrective Action

1. Direct contracts with 2 laboratories (WYLE, ANCO)
2. Cost sharing with other BWRs of WNP-2 vintage (EQUATE)
3. Selected cost-sharing program

   a) Instrument group - supplemental analysis

   b) ITT general dampers

WNP-2 EQUIPMENT QUALIFICATION

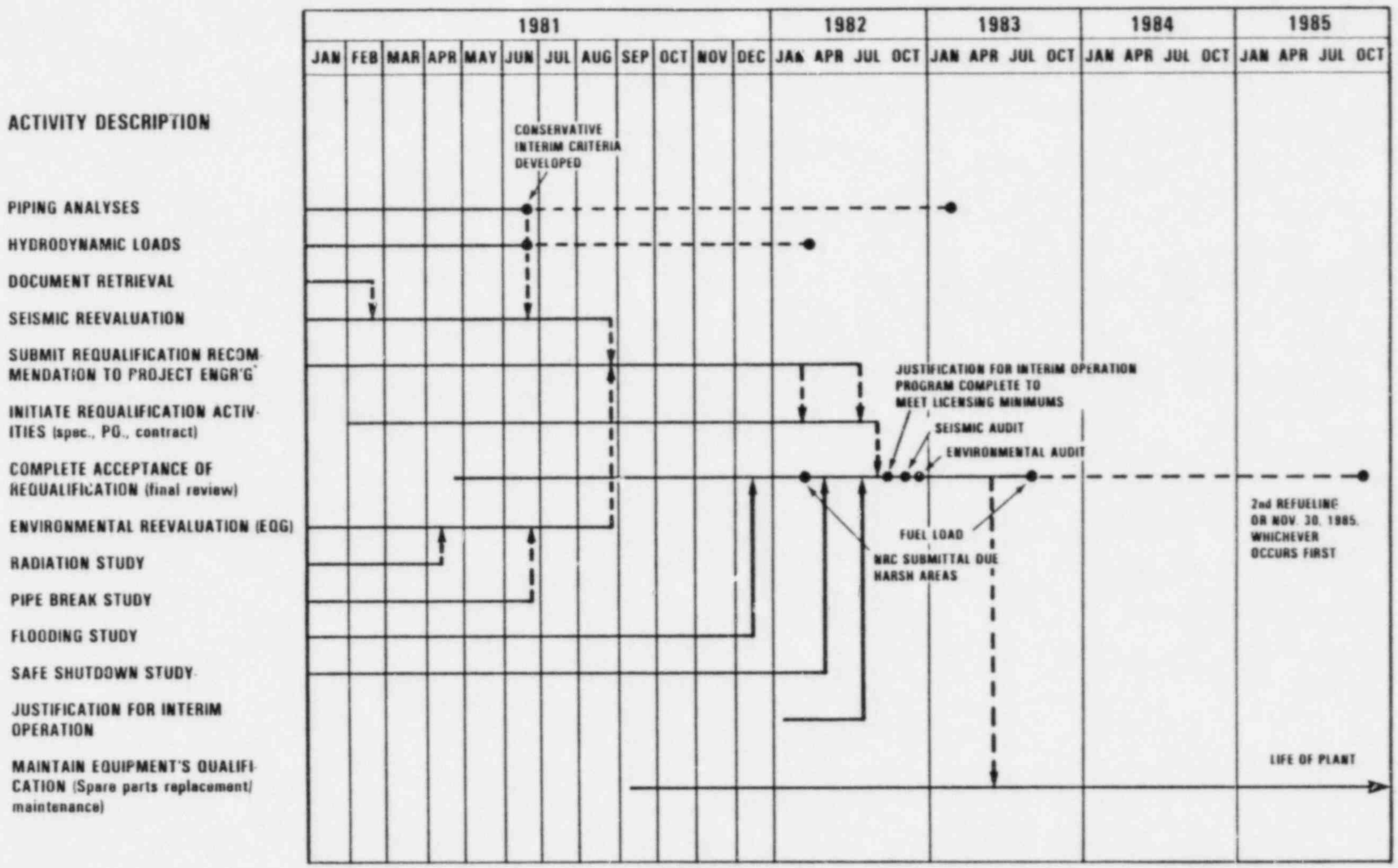
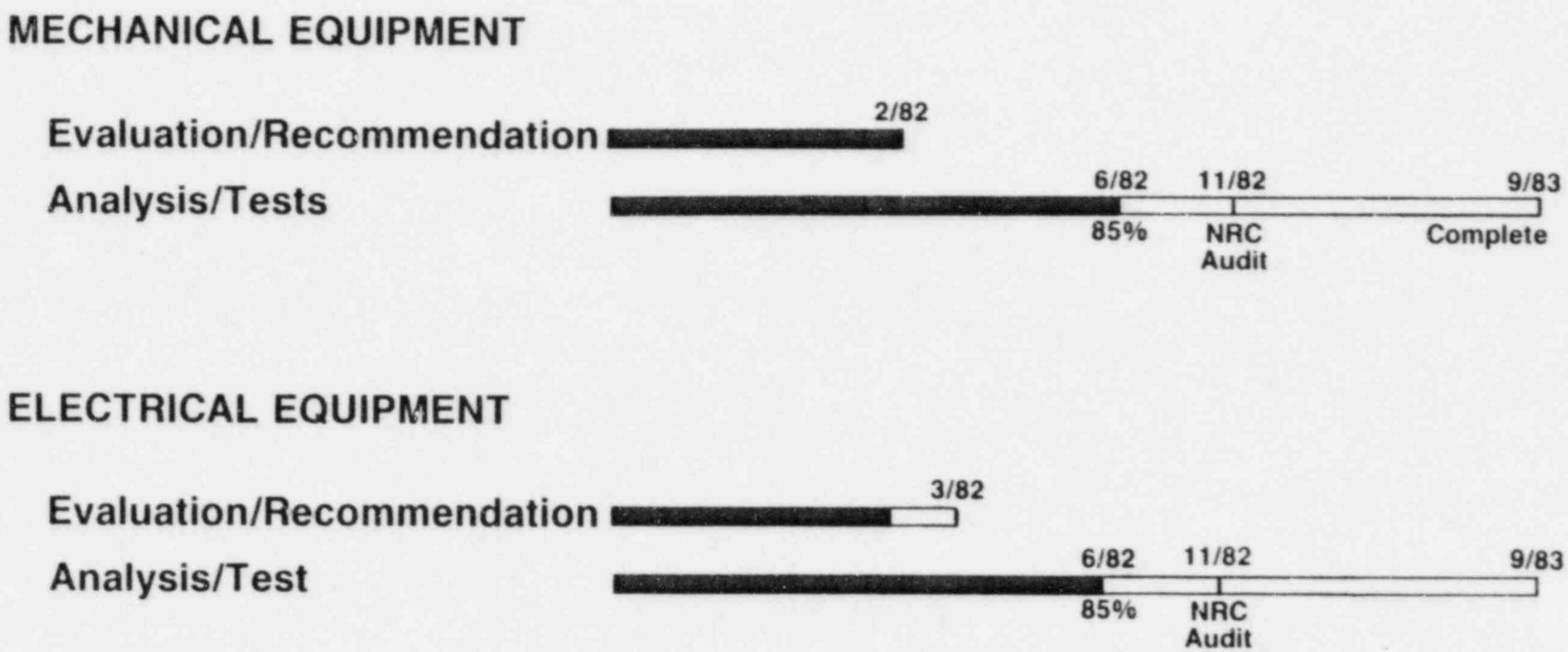


FIGURE 3

82777-1A

SEISMIC QUALIFICATION SCHEDULE



821141-15A

Environmental Qualification Report (Harsh Areas) (IE)

- 1st submittal made: January 15, 1982
- Present Status: 78% qualified
- 2nd submittal: Sept. 1982 includes:
  - — Responses to NRC review of 1st submittal
  - — Completion of confirmatory analysis (environments)
  - — Corrective action plans for equipment with deficient status
  - — Justification that WNP-2 can be operated safety pending completion of corrective actions plans

Schedule

- Assume NRC accept JIO and schedule extension.
- Assume second refueling outage no earlier than November 1985.

If above is true, environmental qualification is not a constraint on plant licensing and initial operation. Cost sharing is possible. Budget can be maintained.

821141-7A

PROGRAMS CURRENTLY UNDERWAY

By Supply System

MARROTA VALVES	Seismic & Environmental
AIR HANDLING UNITS	Seismic
STANDBY GAS TREATMENT SYSTEM EQUIPMENT	Seismic & Environmental
DELCO MOTORS	Seismic

By Cost Sharing Groups

LIMITORQUE M. O.	Seismic & Environmental
EQUATE (SS is sharing in items)	Seismic & Environmental
ITT/GC EHO	Seismic & Environmental

821141-4A

Replacement Actions Currently Underway

- NAMCO limit switches
- ASCO solenoid valves steam tunnel
- ASCO solenoid valves inside containment
- GE, Curtis and Cinch terminal blocks inside containment
- Bailey transmitters

Environmental (Mild Environment) Qualification

- NRC has recently published guidelines that this is not a qualification requirement but a QA requirement.
- A good maintenance and surveillance program meeting Appendix B and Reg. Guide 1.33 is sufficient.
- WNP-2 complies

CONCLUSIONS

- 85% of items are seismically qualified (October 1982 submittal to NRC).
- Have all equipment seismically qualified by fuel load (9/83)
- 80% of 1E items in a harsh environment are qualified (Sept. 1982 submittal to NRC).
- Remaining 20% of 1E items in a harsh environment are scheduled for qualification (e.g., test, analysis, modification, relocation or replacement).
- Have justification for interim operation approved prior to fuel load.
- Have all 1E items in a harsh environment qualified by November 30, 1985.

821141

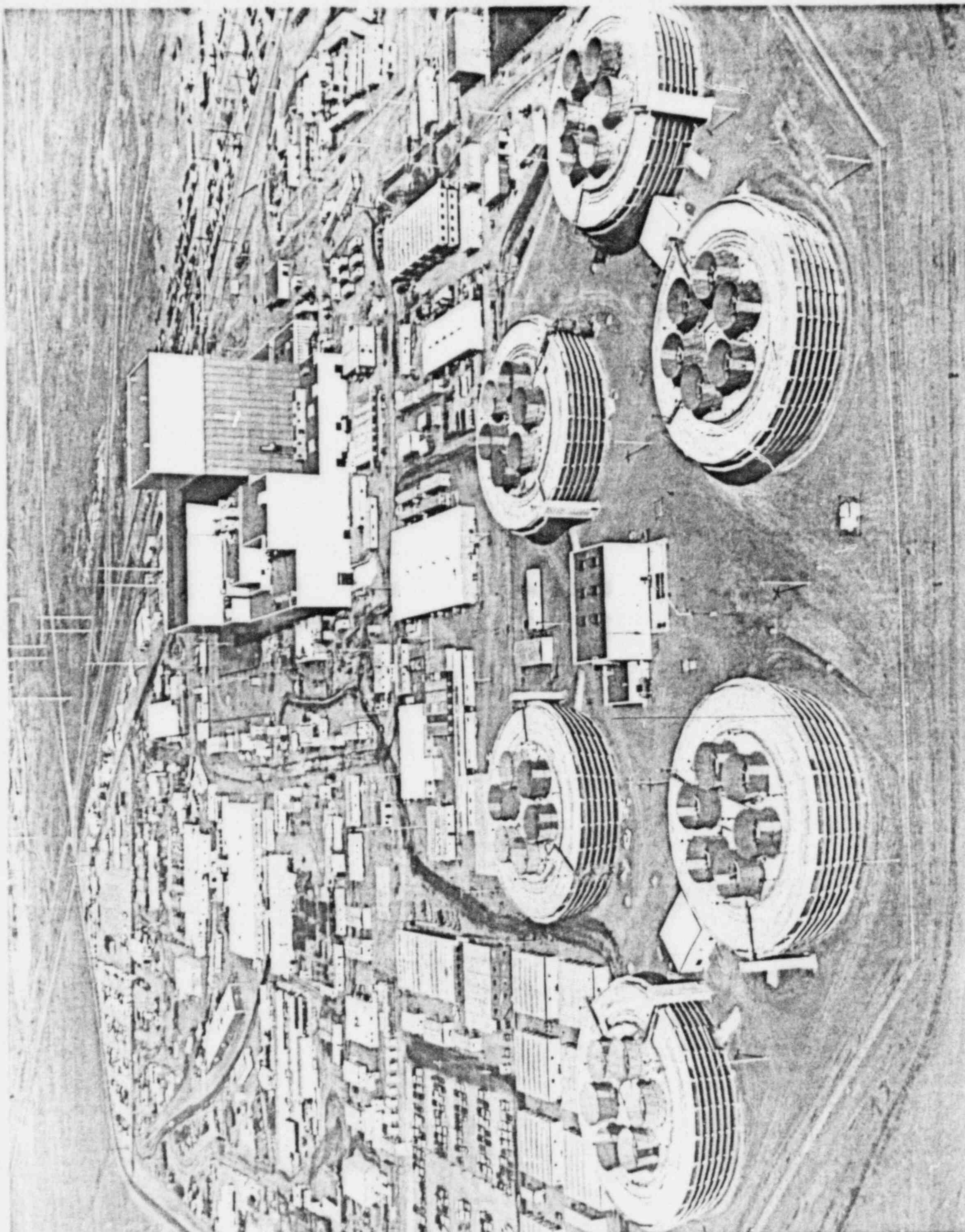
SELECTED PLANT SYSTEMS

PLANT LAYOUT
CONTROL ROOM AND HUMAN FACTORS
DECAY HEAT REMOVAL
EMERGENCY OPERATING PROCEDURES

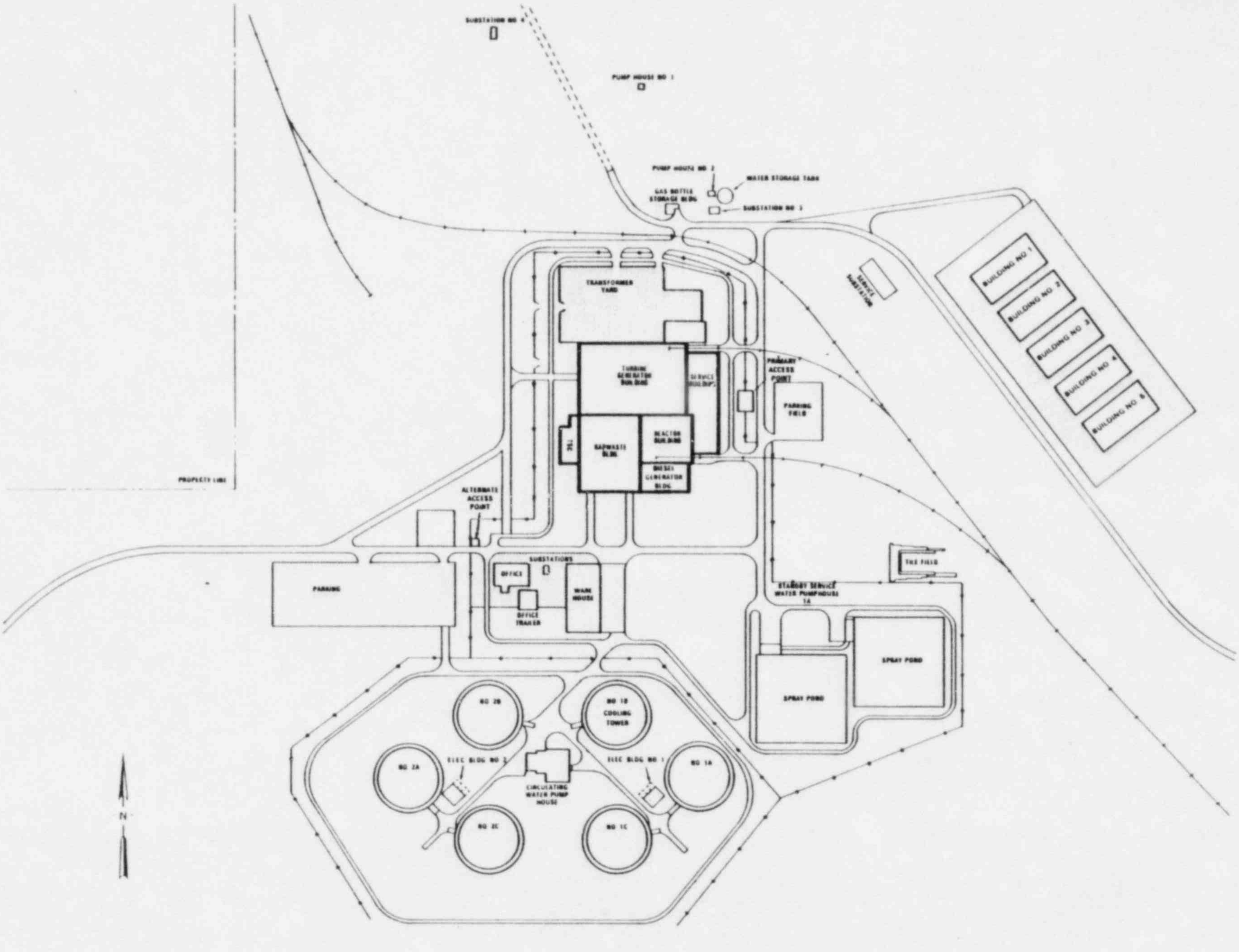
R. L. CORCORAN

OPERATIONS MANAGER,
WNP-2

821702



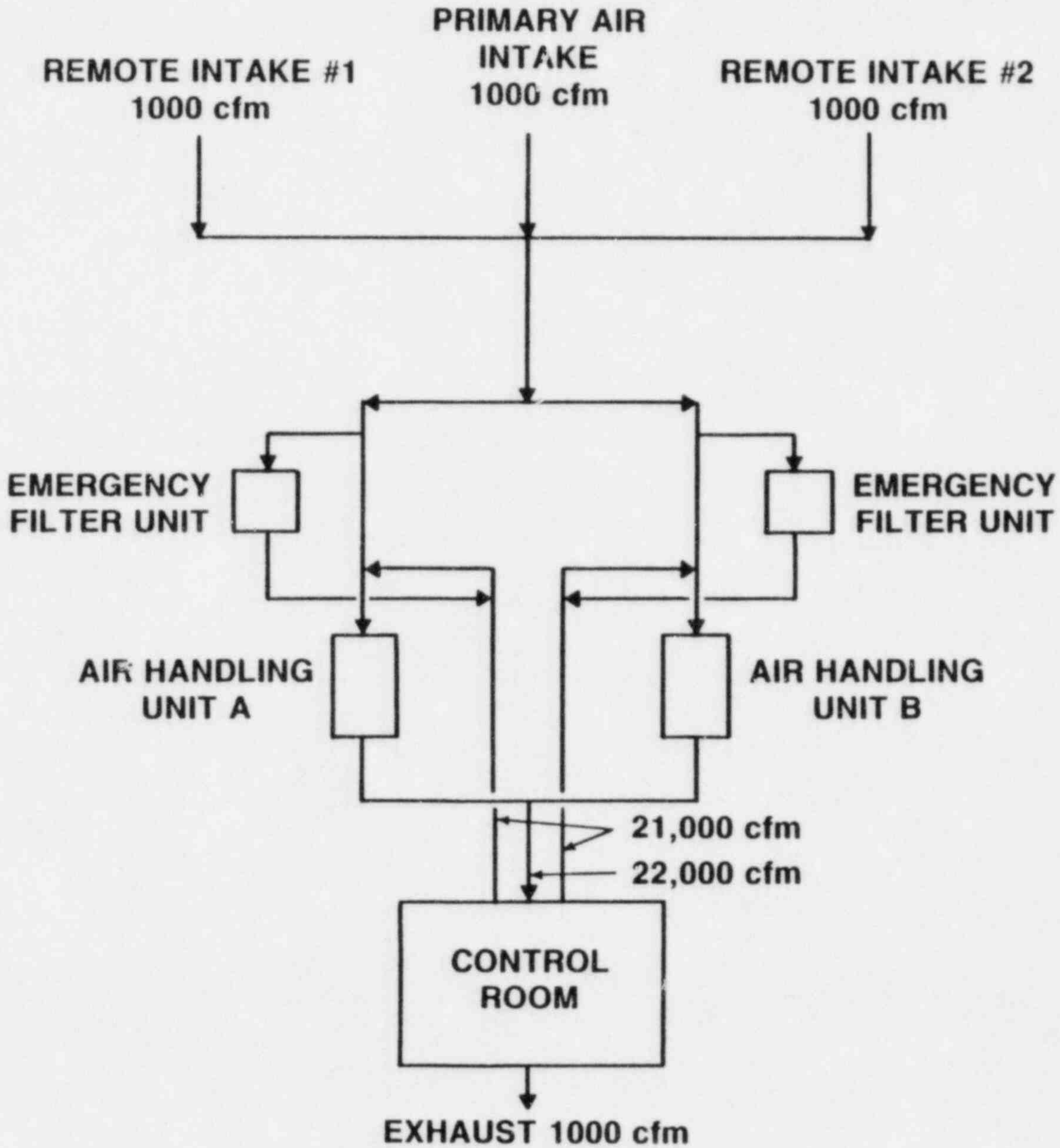
WNP-2 Plant Site



CONTROL ROOM HABITABILITY

THE MAIN CONTROL ROOM HABITABILITY SYSTEMS ARE DESIGNED TO ENSURE HABITABILITY DURING ALL NORMAL AND ABNORMAL STATION OPERATING CONDITIONS, INCLUDING 30 DAYS FOLLOWING A LOCA. (PORTABLE BREATHING APPARATUS AND FIVE DAYS WORTH OF FOOD, WATER, MEDICAL SUPPLIES AND SANITARY AND HYGENIC FACILITIES STORED IN CONTROL ROOM)

CONTROL ROOM - SIMPLIFIED HVAC FLOW DIAGRAM



CONTROL ROOM HABITABILITY

SYSTEM DESCRIPTION

- TWO HVAC SYSTEMS, OPERATED FROM CONTROL ROOM, EACH DELIVER 21,000 CFM OF RECIRCULATED AND 1,000 CFM OF OUTSIDE AIR TO THE CONTROL ROOM.
- ALL REQUIRED COMPONENTS ARE REDUNDANT, SEISMIC CATEGORY I, AND CLASS 1E POWERED.
- ADEQUATE SHIELDING PROTECTS OPERATORS FROM RADIATION STREAMING
- CONTROL ROOM DOORS PROTECT OPERATORS FROM STEAM PIPEBREAK IN TURBINE GENERATOR BUILDING.

821050-52A

CONTROL ROOM HABITABILITY

LOCA SCENARIO

- SIGNALS AUTOMATICALLY
  - CLOSE LOCAL FRESH AIR INTAKE
  - CLOSE EXHAUST LINES IN CONTROL ROOM
  - START EMERGENCY FILTER UNITS ON PRESSURIZING MODE OF OPERATION
- EMERGENCY FILTER UNITS
  - DRAW AIR FROM REMOTE AIR INTAKE LINES
  - SUPPLY AIR TO CONTROL ROOM HVAC SYSTEM
  - MAINTAIN CONTROL PRESSURE 0.125 IN. W.G.
- RADIATION DETECTORS IN REMOTE AIR INTAKE LINES AUTOMATICALLY CLOSE THE LINES IF LIMITS ARE EXCEEDED. ELECTRICAL INTERLOCKS ENSURE BOTH LINES ARE NOT CLOSED AT SAME TIME

821050-53A

CONTROL ROOM HABITABILITY

CHLORINE SCENARIO

- REDUNDANT CHLORINE DETECTORS IN COMMON INTAKE HEADER
- AUTOMATIC ISOLATION OF CONTROL ROOM WITHIN 10 SECONDS
  - CLOSE FRESH AIR INTAKE
  - CLOSE EXHAUST LINES IN CONTROL ROOM
  - START EMERGENCY FILTER UNITS IN RECIRCULATING MODE OF OPERATION

821050-54A

CONTROL ROOM HUMAN FACTORS PROGRAM

DUAL APPROACH

WNP-2 IN-HOUSE PROGRAM	BWR OWNER'S GROUP PROGRAM
1. EARLY DEFINITION OF HARDWARE CHANGES	1. PREPARE ACCEPTABLE GENERIC PROGRAM
2. COORDINATION OF CONTROL ROOM CHANGES.	2. TRAIN UTILITY/GE/HF SPECIALIST TEAMS TO IMPLEMENT
	3. PROVIDE WNP-2 INDEPENDENT REVIEW BY PEERS AFTER INCORPORATING IN-HOUSE IMPROVEMENTS.

821050-45A

WNP-2 IN-HOUSE PROGRAM

TASK FORCE	• PLANT OPERATIONS • PROJECT ENGINEERING • ARCHITECT/ENGINEER • GENERAL PHYSICS CORP. (HUMAN ENGINEERING SPECIALISTS)

PERFORM CONTROL ROOM/REMOTE SHUT-DOWN PANEL REVIEWS	• BASED ON
	  • WNP-2 OPERATIONAL REVIEWS
	  • BWR OWNER'S GROUP PROGRAM
	  • NUREG-0700 GUIDELINES
	  • RESULTS FROM OTHER UTILITIES

PROVIDE COORDINA-TION AND CHANGE CONTROL	• REVIEW ALL CONTROL ROOM DESIGN CHANGES FOR HUMAN FACTOR CONCERNS
	• COORDINATE RELATED ACTIVITIES
	  • EMERGENCY PROCEDURES
	  • REGULATORY/TMI CHANGES
	  • SIMULATOR MODIFICATIONS

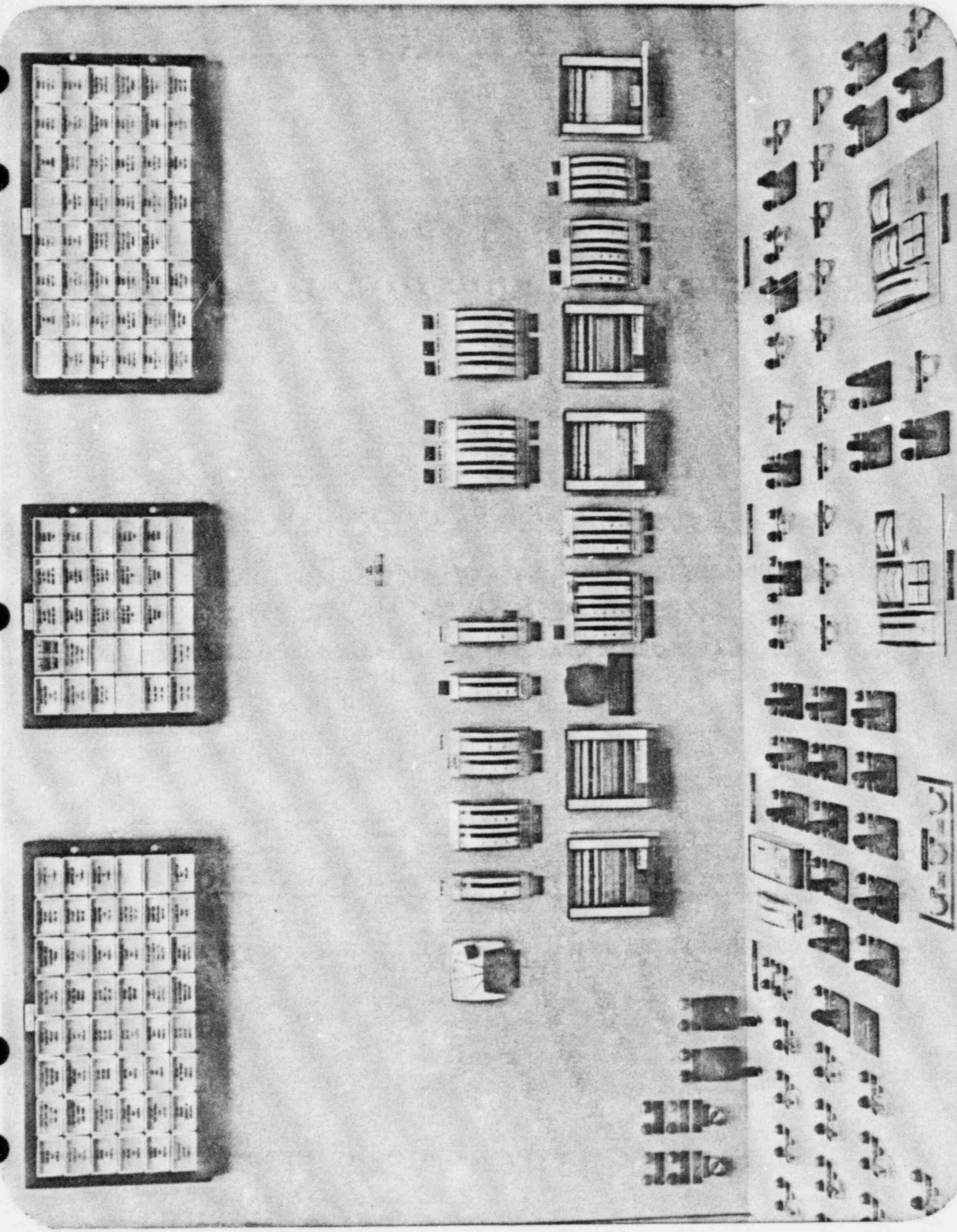
IMPROVEMENTS

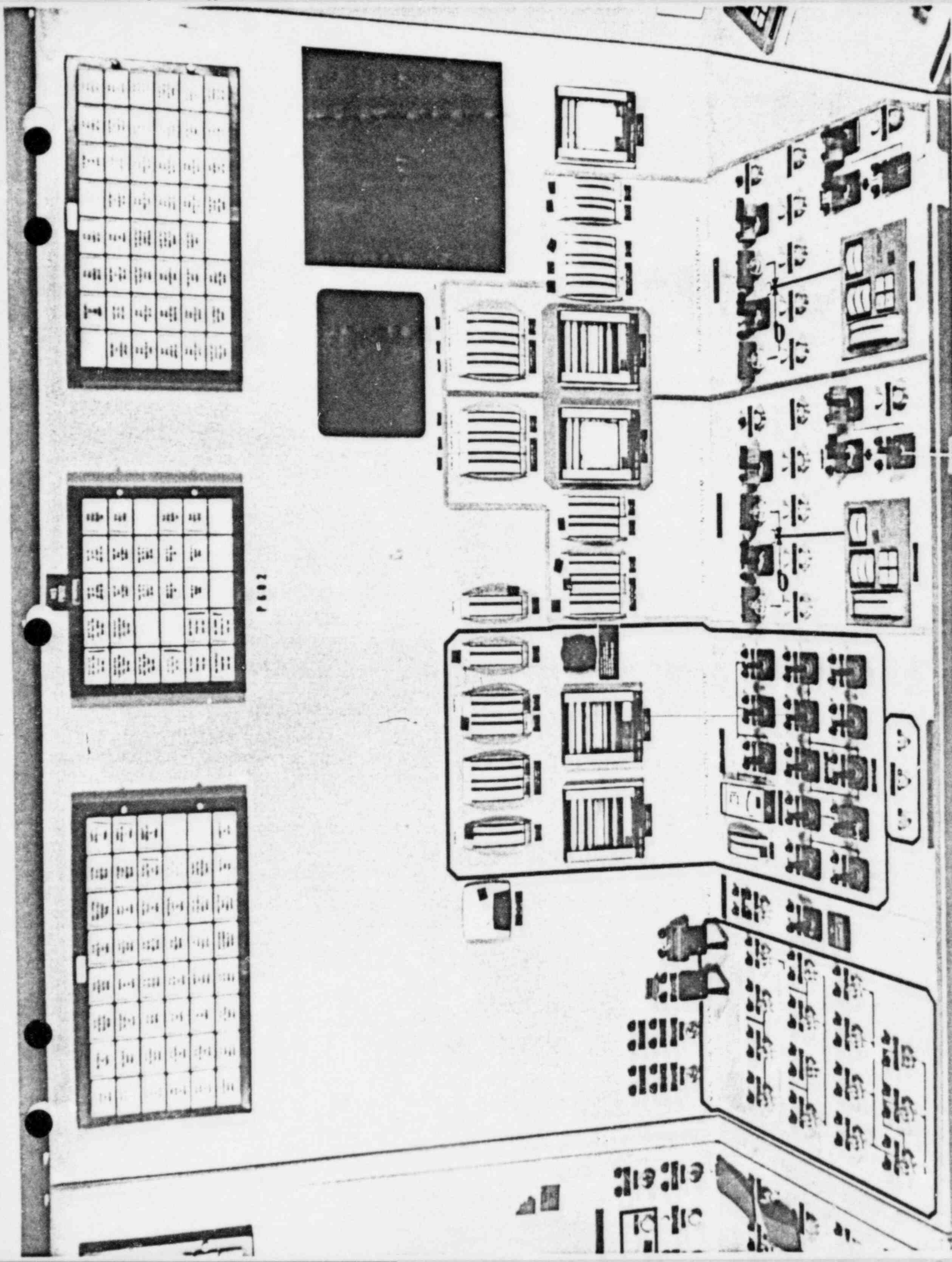
CONTROLS/ DISPLAYS	• RELOCATED/REARRANGED/DELETED 130 CONTROLS 140 DISPLAYS • RHR/RFW SYSTEMS ACCOUNT FOR 60% OF CONTROL CHANGES • ELECTRICAL BENCHBOARD ACCOUNTS FOR 75% OF DISPLAY CHANGES (50 DISPLAYS DELETED, 40 REARRANGED) • 39 CONTROL SWITCHES REPLACED DUE TO REVERSE ROTATION
ENHANCEMENTS	• MIMICED MAJOR SAFETY AND SELECTED BOP SYSTEMS • DEMARCATED CONTROL ROOM PANELS • DESIGNED NEW LEGEND PLATE SYSTEM • 100% REPLACEMENT ON MAIN BENCH-BOARDS

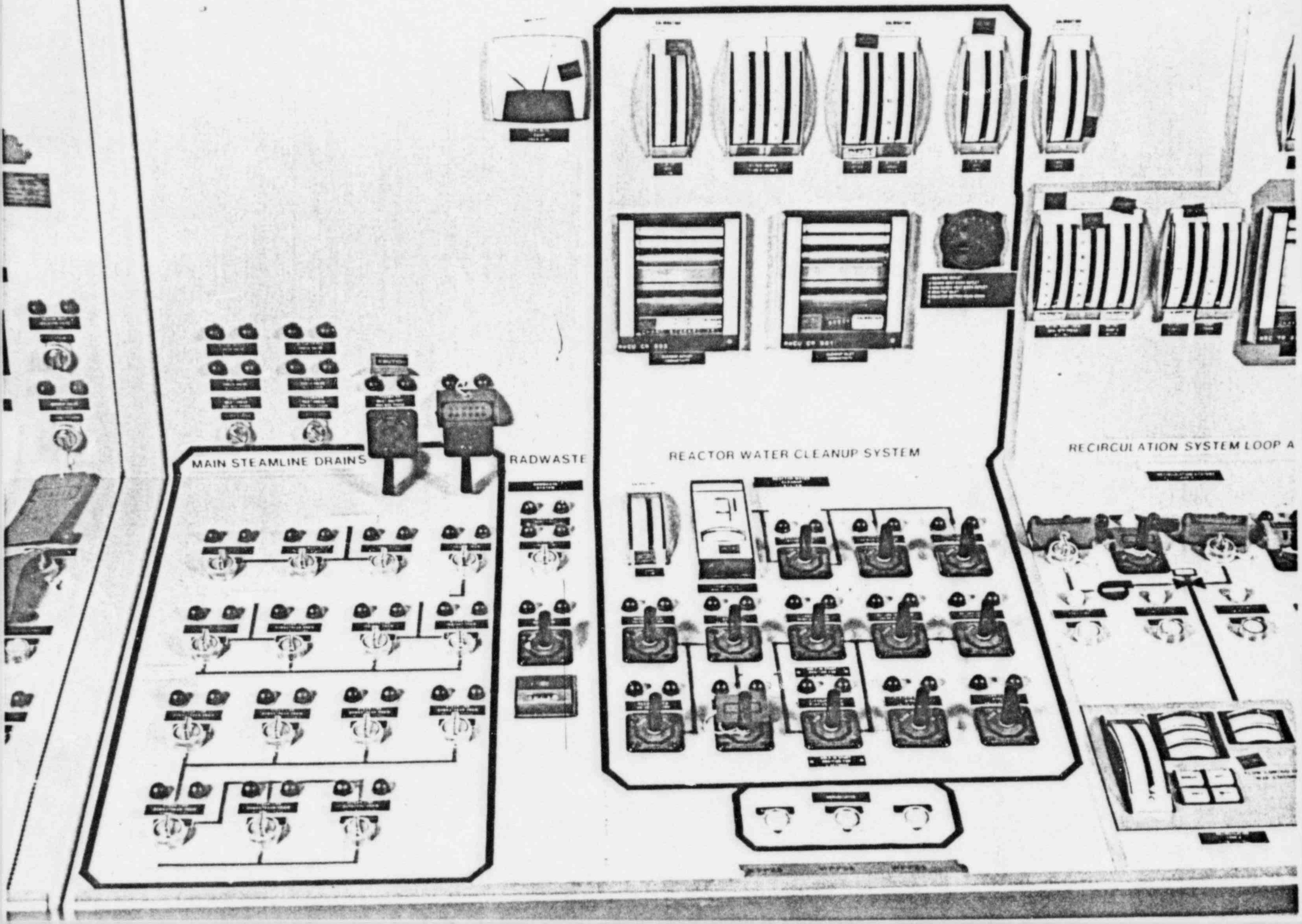
IMPROVEMENTS (CONTINUED)

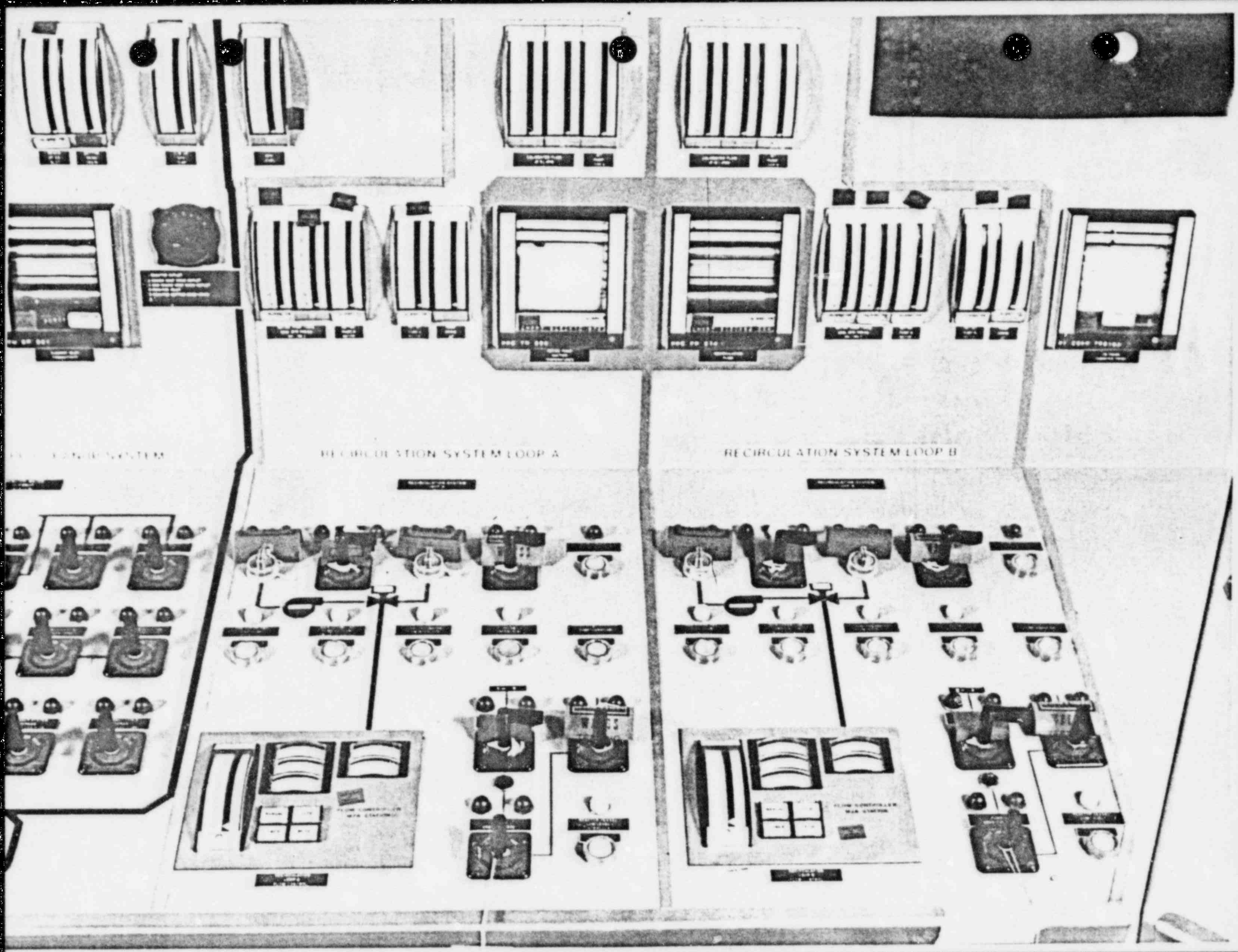
ANNUNCIATOR SYSTEM

- PROVIDED AUDIO SILENCE CAPABILITY THROUGHOUT CONTROL ROOM
- IMPROVED AUDIO DIRECTIVITY
  - CHANGED FROM 2 TO 3 TONE GROUPING
  - ADDED ADDITIONAL SPEAKERS
- RELOCATED/ADDED ADDITIONAL RESPONSE CONTROLS
- COLOR CODED/PRIORITIZED CONTROL ROOM ALARMS
- REARRANGED 190 ALARMS ON MAIN BENCHBOARDS
- IMPROVED INFORMATIONAL CONTENT OF ALARMS




P602


MAIN STEAMLINE DRAINS
RADWASTE
REACTOR WATER CLEANUP SYSTEM
RECIRCULATION SYSTEM LOOP A

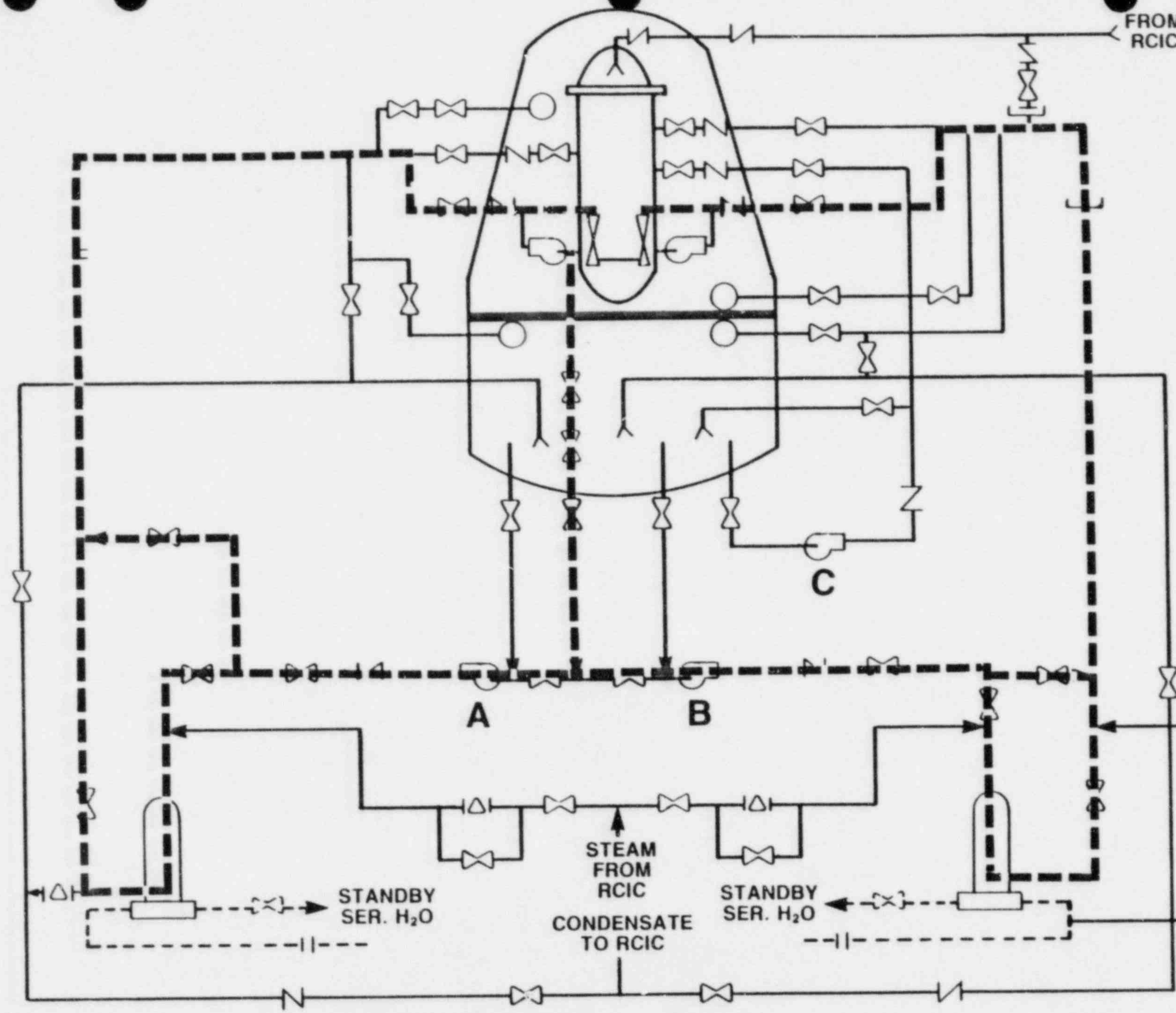

RECIRCULATION SYSTEM LOOP A
RECIRCULATION SYSTEM LOOP B

CONTROL ROOM HUMAN FACTORS

PROGRAM SUMMARY

IN-HOUSE REVIEWS	• CONTINUE THRU 1982
BWR OWNER'S GROUP INDEPENDENT REVIEW	• SCHEDULED 1/83
PANEL CHANGES	• STARTED 3/82 • ESSENTIALLY COMPLETE 1/83 • OPEN ITEMS COMPLETE BY FUEL LOAD
NRC REPORT	• PROGRAM REPORT PRIOR TO FUEL LOAD

821702



SHUTDOWN COOLING MODE

821048-2A

DECAY HEAT REMOVAL

(NORMAL)

MAIN STEAM TO CONDENSER
FEEDWATER TO R.P.V.

→ REJECT HEAT TO COOLING TOWERS VIA CIRC. WATER SYS.

↓

SHUTDOWN COOLING MODE OF RHR TO COLD SHUTDOWN

→ REJECT HEAT TO COOLING TOWERS OR SPRAY PONDS VIA STANDBY SERVICE WATER (SSW) SYS.

821702

DECAY HEAT REMOVAL

(RPV ISOLATED FROM MAIN CONDENSER)

RPV STEAM THROUGH RELIEF VALVES TO SUPPRESSION POOL AND HPCS PROVIDE MAKEUP FROM C.S.T.

OR

RPV STEAM TO RCIC SYS. WITH MAKEUP FROM C.S.T. OR SUPPRESSION POOL

→ REJECT HEAT TO SUPPRESSION POOL AND RHR/SSW TO COOL SUPPRESSION POOL

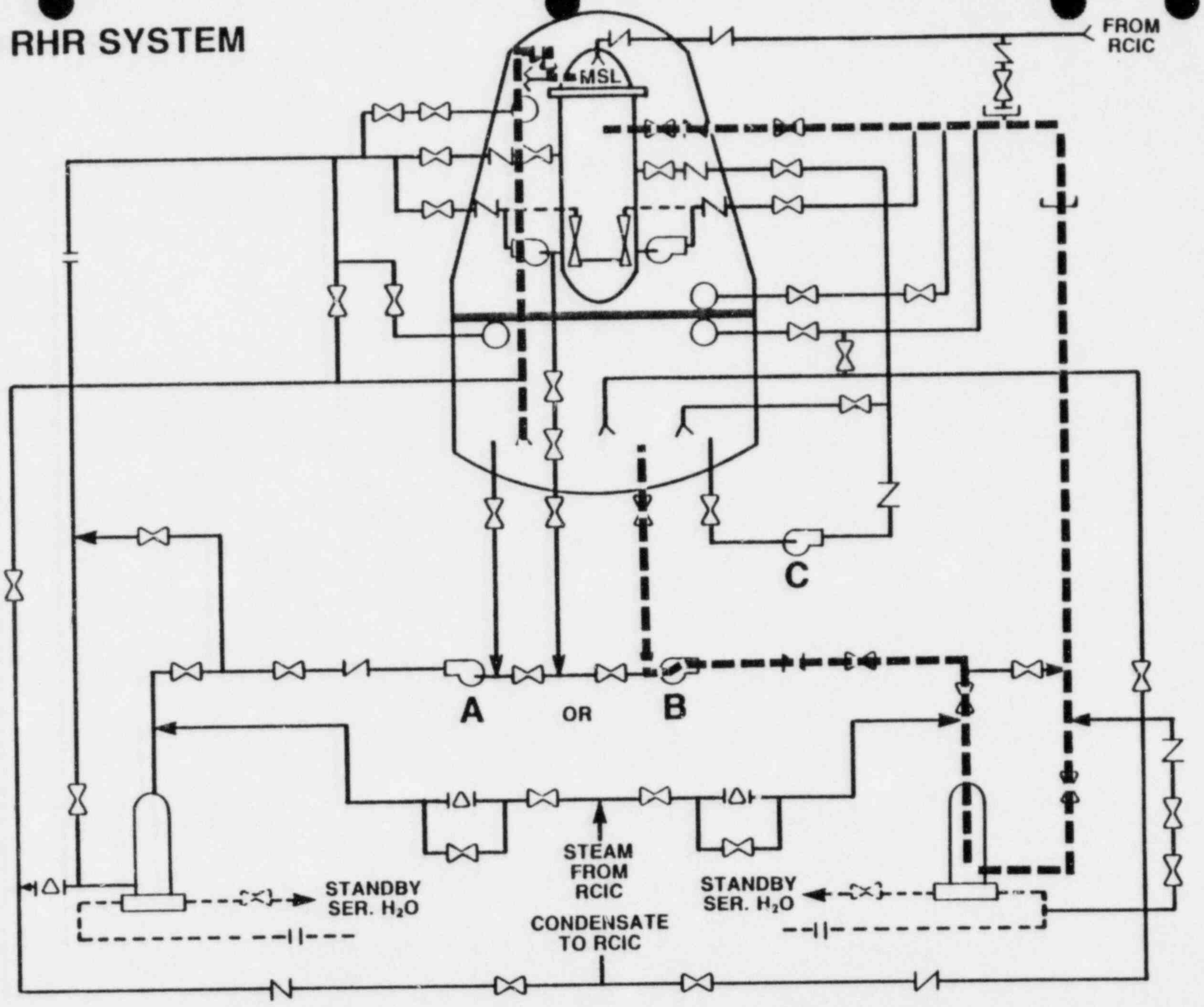
↓

SHUTDOWN COOLING MODE OF RHR TO COLD SHUTDOWN

→ REJECT HEAT TO COOLING TOWERS OR SPRAY PONDS VIA SSW

821702

RHR SYSTEM



ALTERNATE SHUTDOWN MODE (LOOP A OR B)

821048-2A

DECAY HEAT REMOVAL

(RHR SHUTDOWN COOLING MODE UNAVAILABLE)

RPV STEAM THROUGH RELIEF VALVES TO SUP-
PRESSSION POOL AND RHR-LPCI MODE OR LPCS
PROVIDE MAKEUP FROM SUPPRESSION POOL

↓

REJECT HEAT TO SUPPRESSION POOL AND
RHR/SSW TO COOL SUPPRESSION POOL

821702

SUMMARY

SEVERAL DIVERSE MEANS ARE AVAILABLE TO REMOVE DECAY HEAT FROM THE CORE AND TO BRING THE REACTOR TO THE COLD SHUTDOWN CONDITION.

821702

EMERGENCY OPERATING PROCEDURES

DEFINITION

PHILOSOPHY

EMERGENCY OPERATING PROCEDURE GUIDELINES

SYMPTOM-BASED

IMPLEMENTATION PLAN FOR EMERGENCY OPERATING PROCEDURES

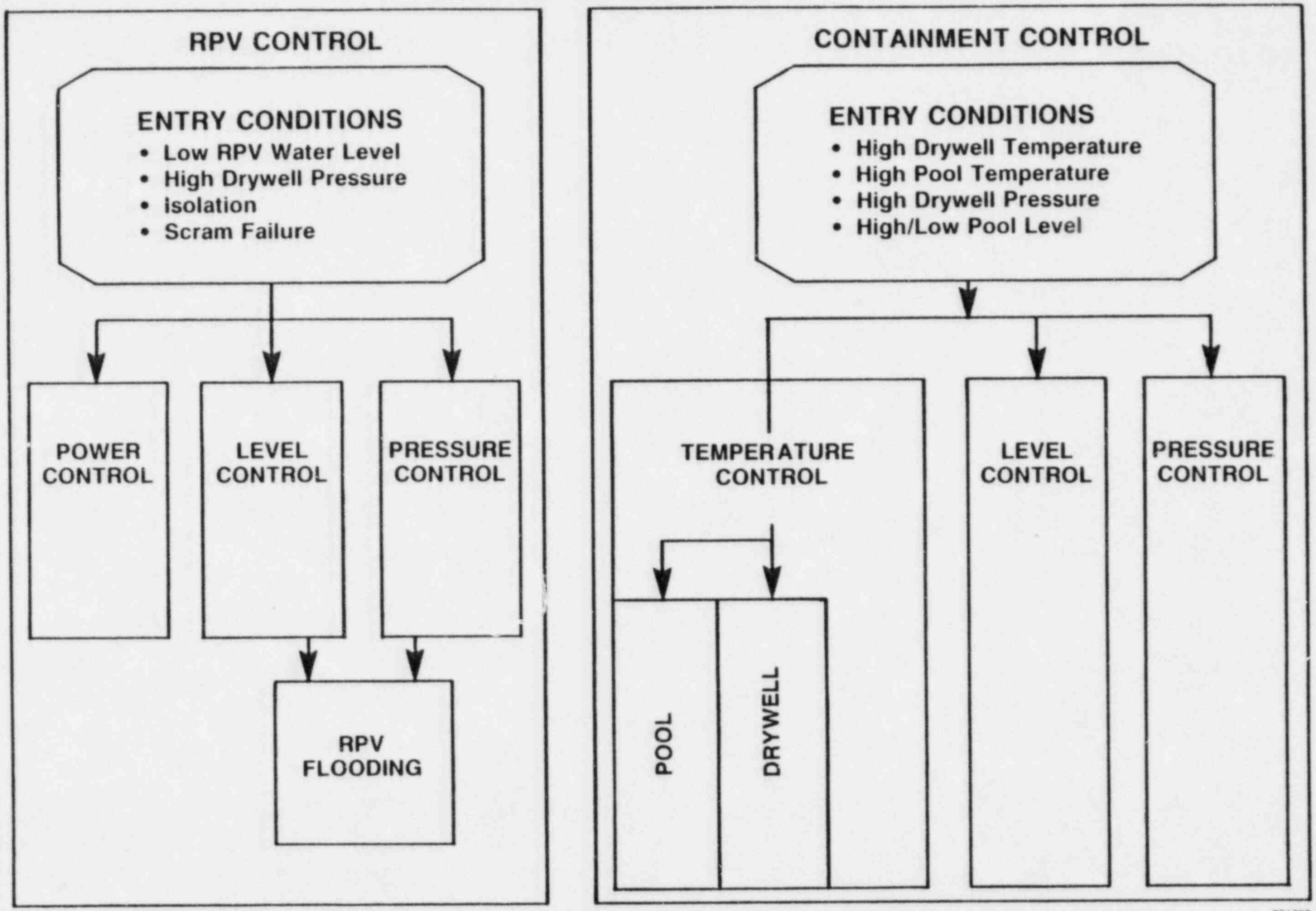
PREPARATION

REVIEW

VALIDATION

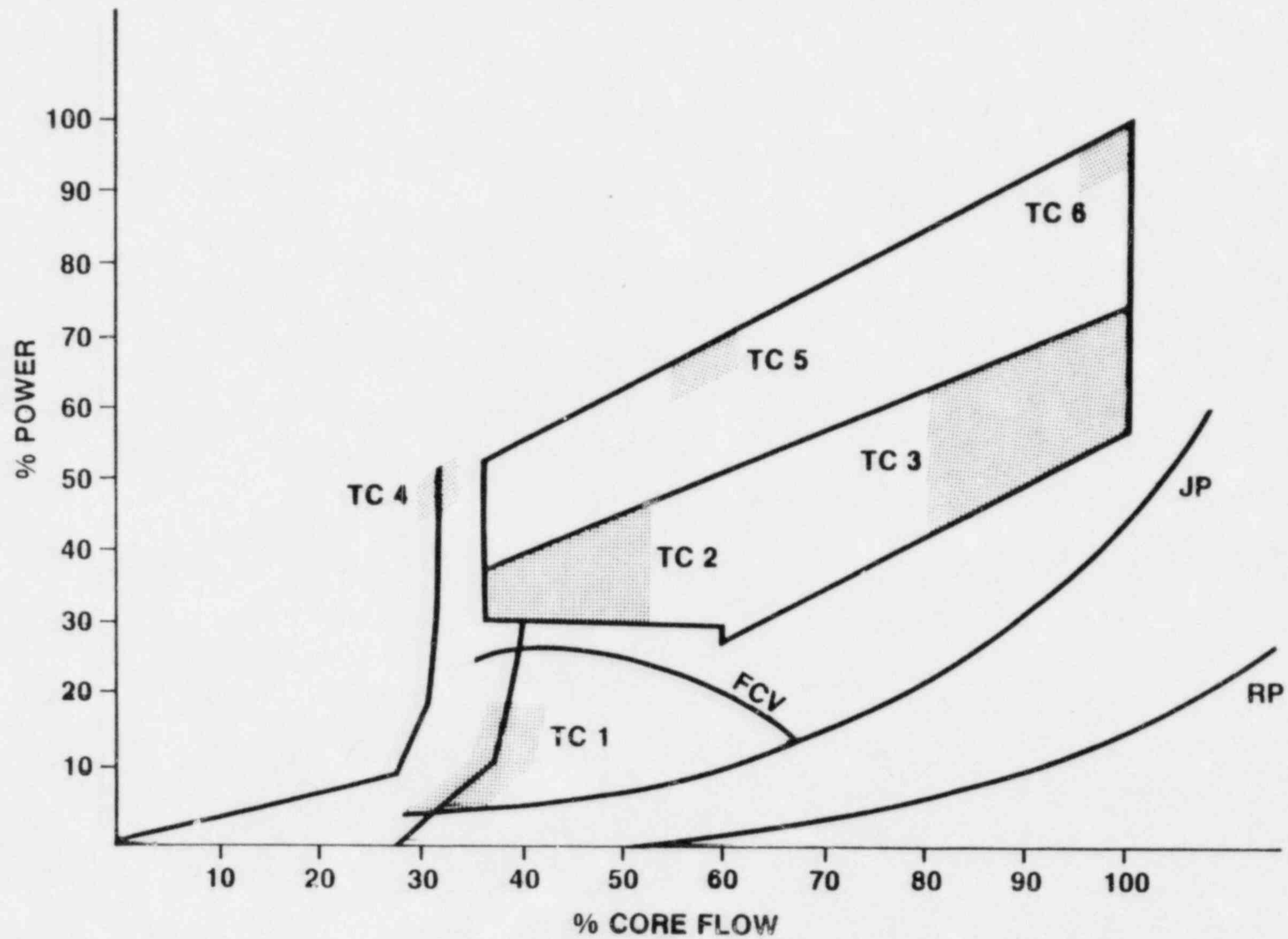
OPERATOR TRAINING

PROCEDURE ORGANIZATION



821702

WNP-2 POWER/FLOW MAP
PAT PROGRAM TEST CONDITIONS

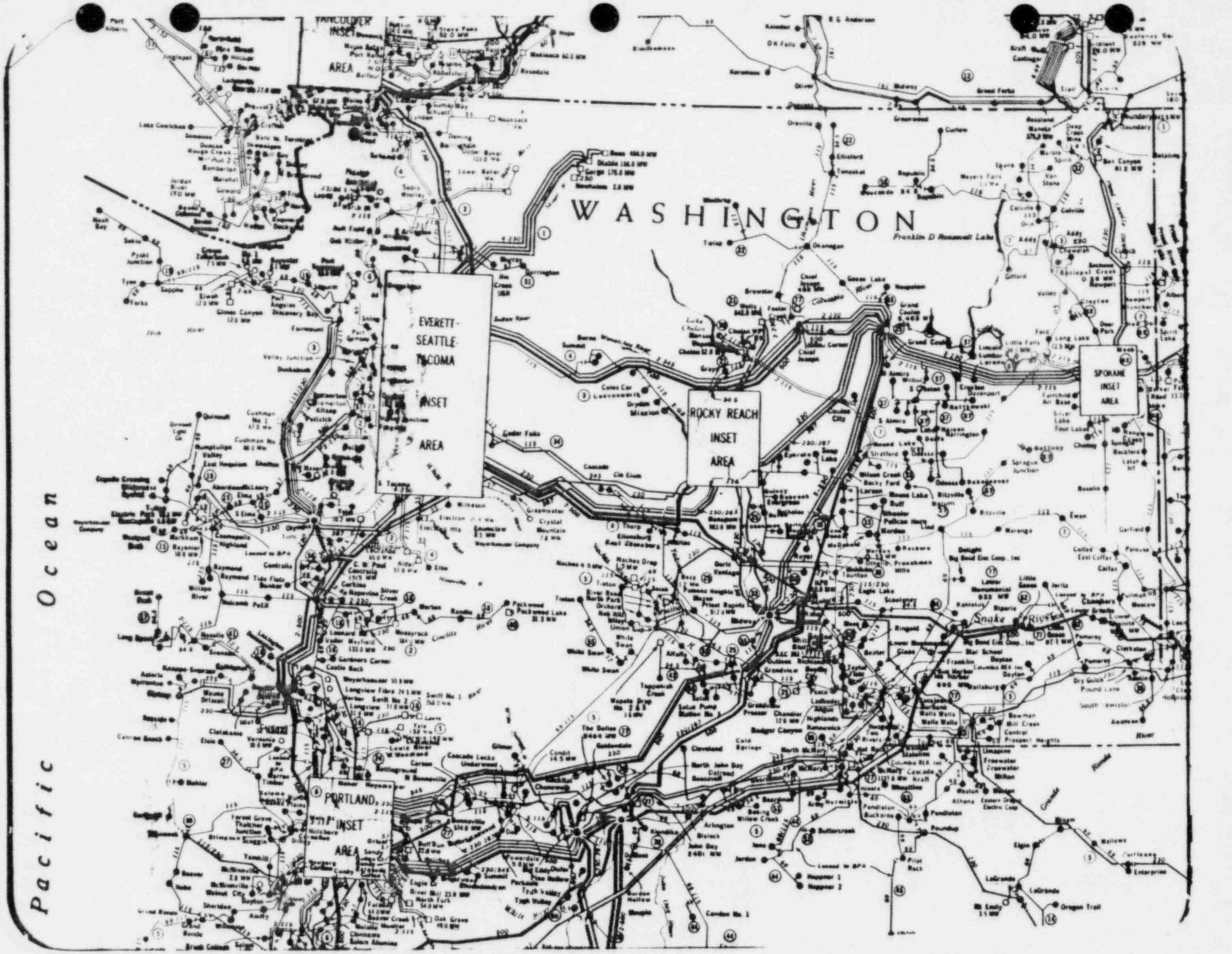


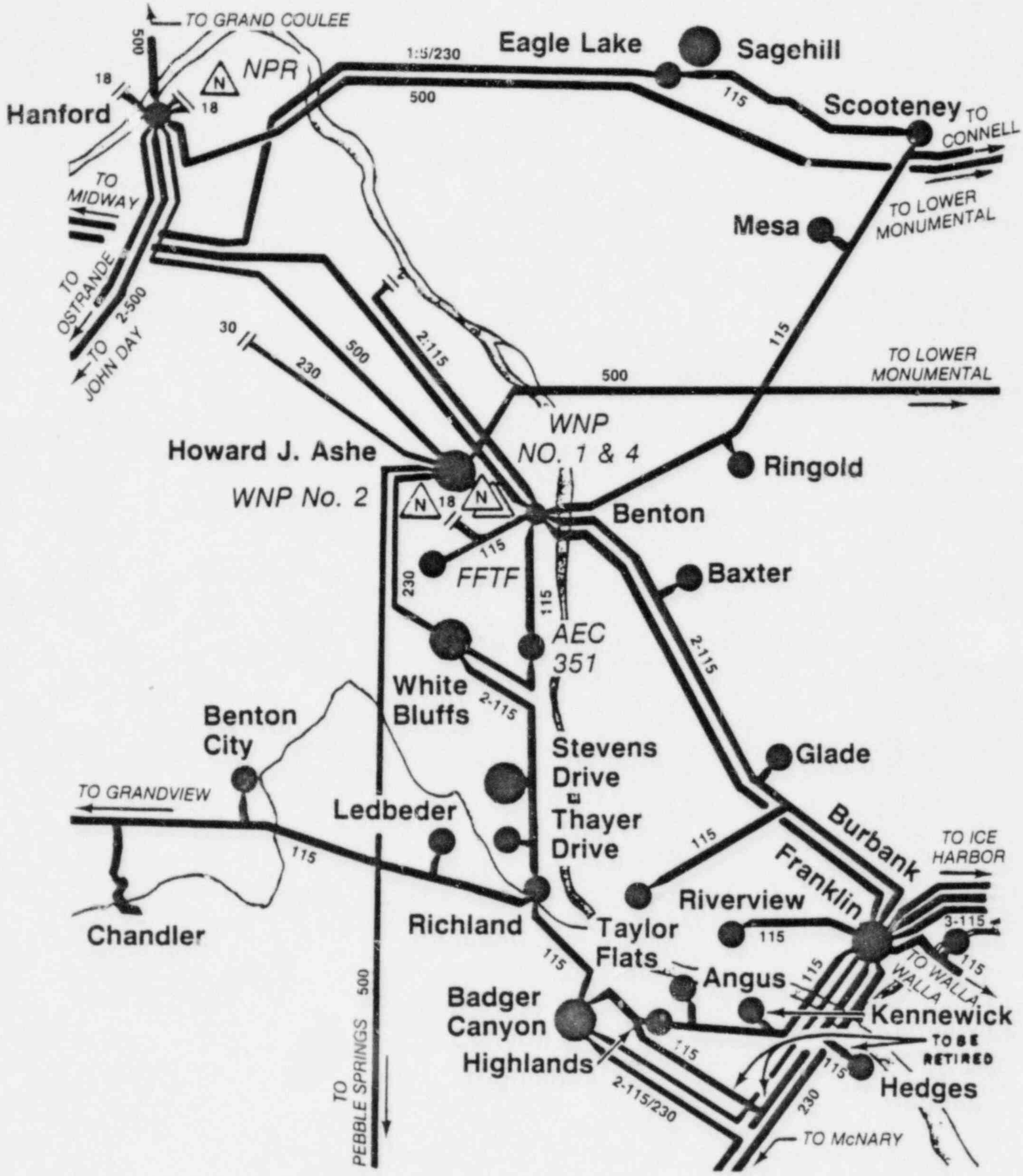
ELECTRICAL/I&C

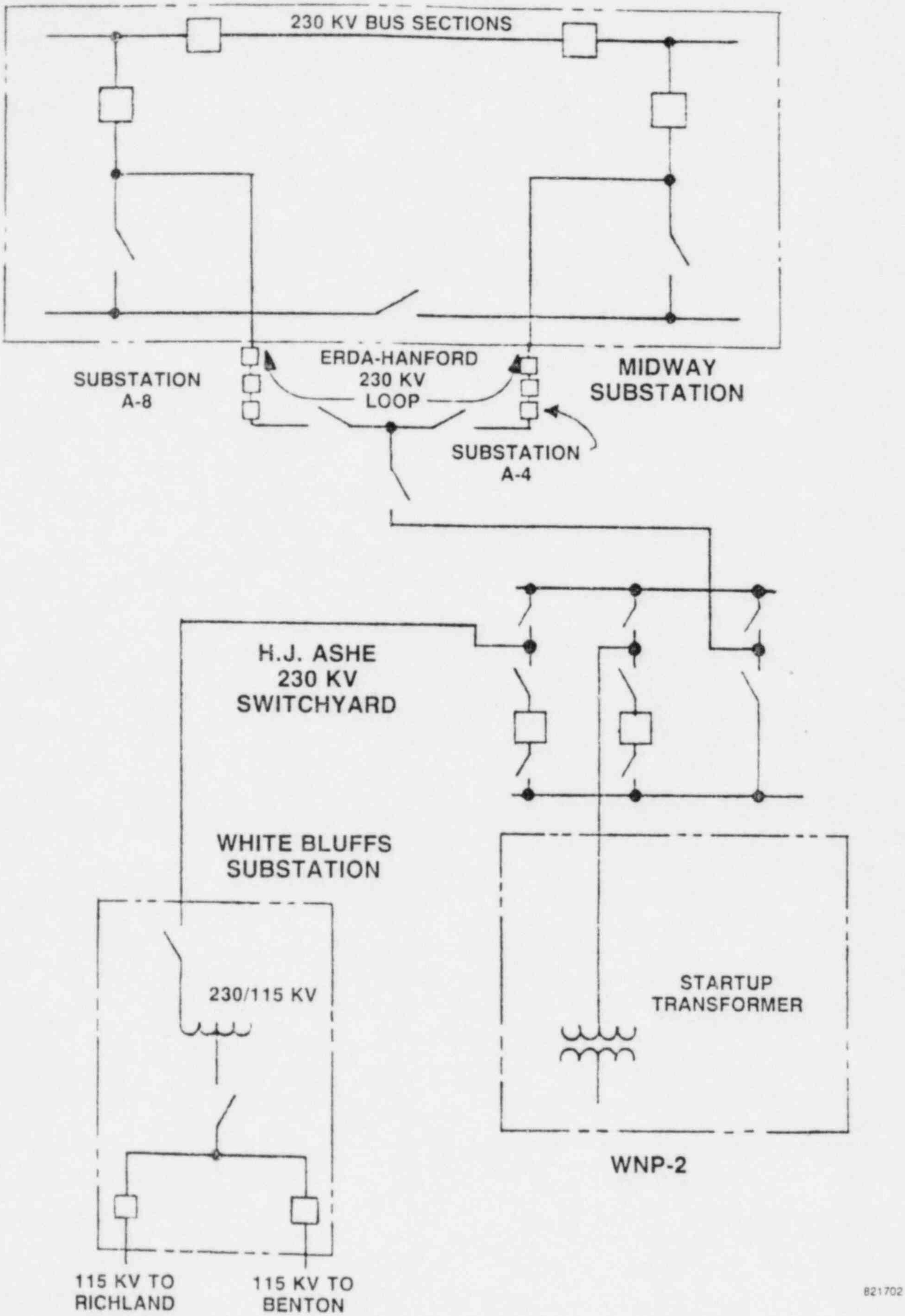
- RELIABILITY OF AC AND DC
- FOLLOW THE COURSE OF AN INCIDENT
- REMOTE SHUTDOWN

C. M. POWERS

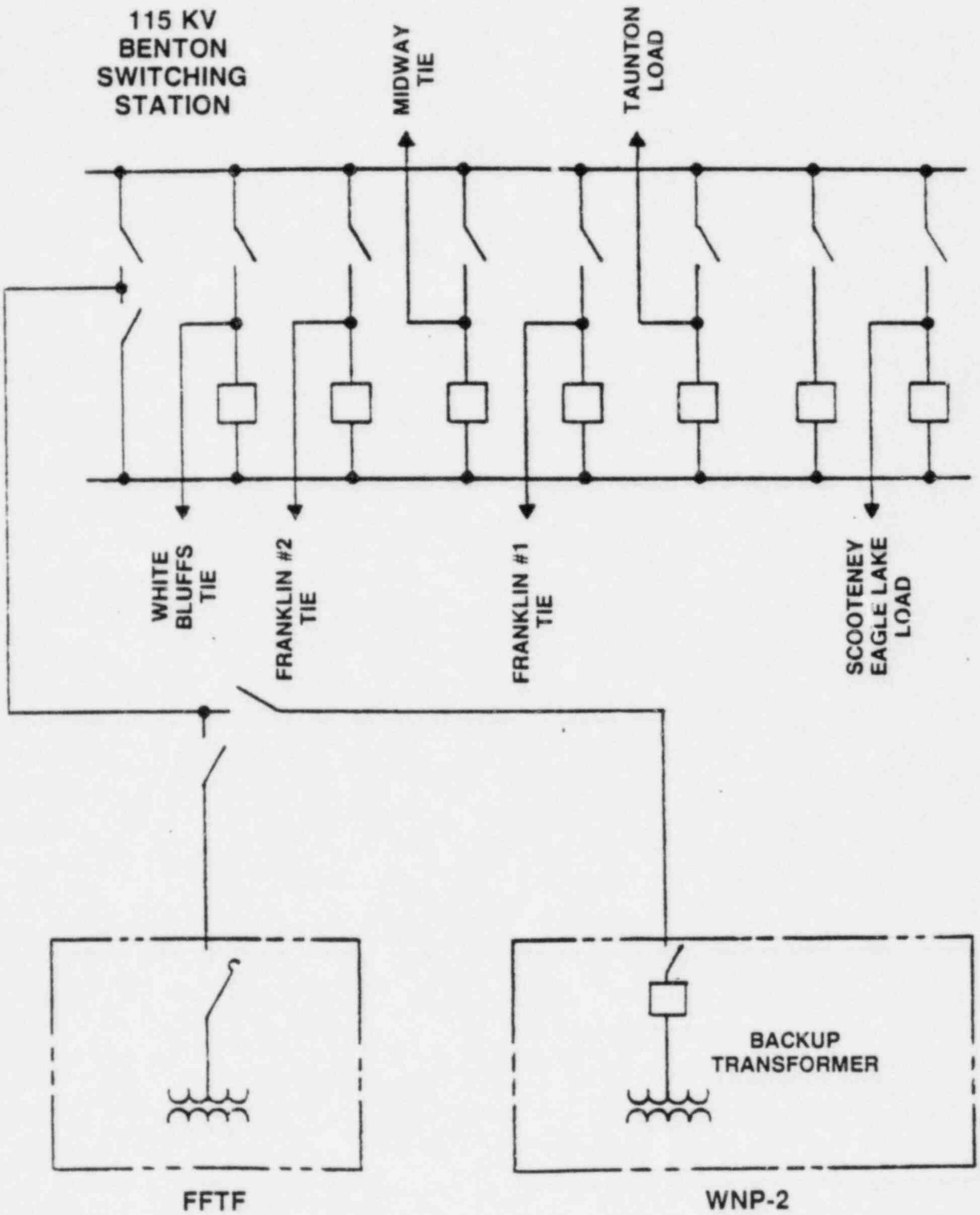
SUPERVISOR,
REACTOR ENGINEERING, WNP-2


WASHINGTON
Pacific Ocean
EVERETT SEATTLE TACOMA INSET AREA
ROCKY REACH INSET AREA
SPOKANE INSET AREA
PORTLAND INSET AREA
VANCOUVER INSET AREA
Franklin D Roosevelt Lake
Snake River

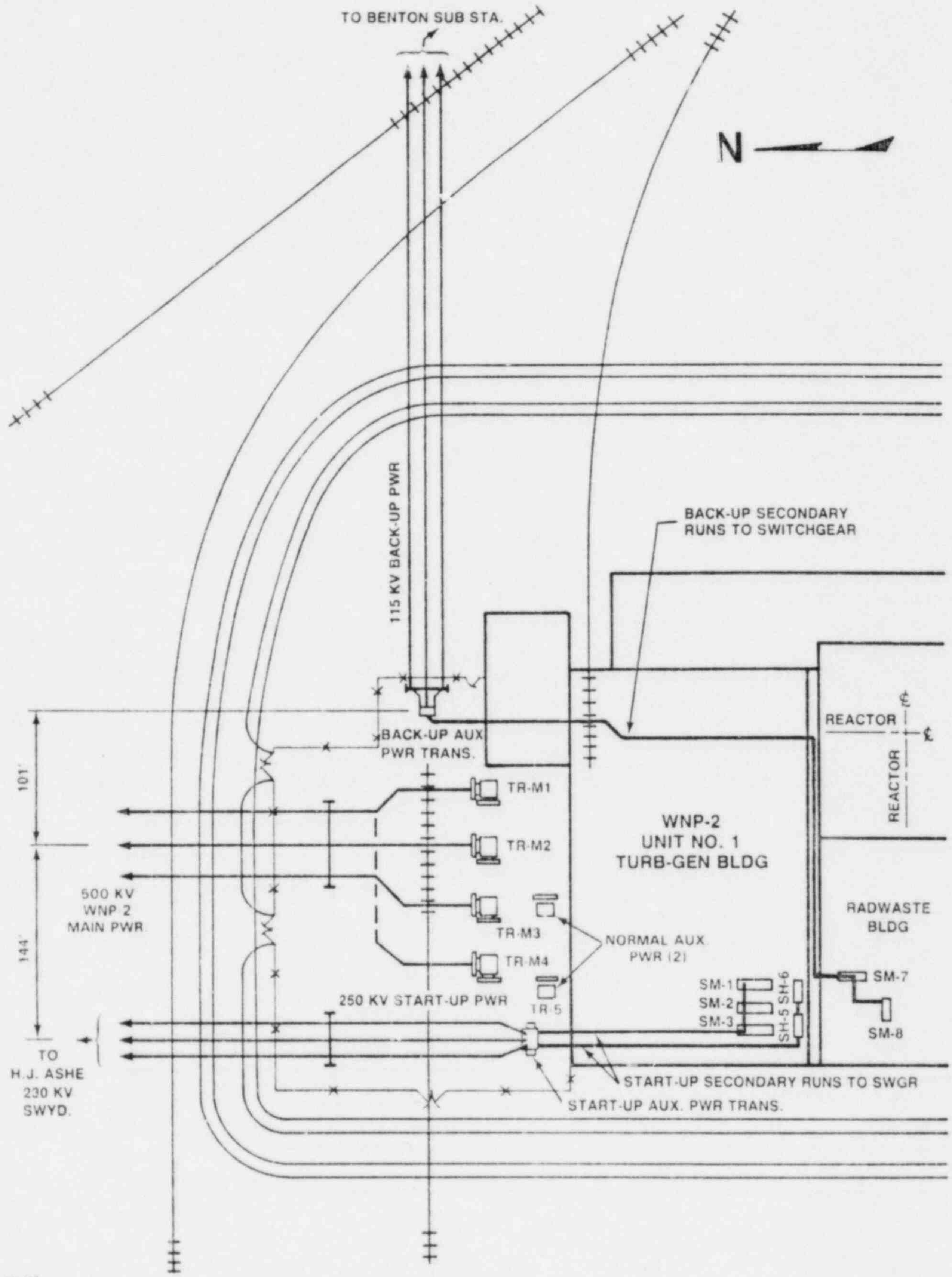

TO GRAND COULEE
500
NPR
1:5/230
Eagle Lake
Sagehill
500
115
Scooteney
TO CONNELL
18
Hanford
18
TO MIDWAY
TO OSTRANDE
2-500
TO JOHN DAY
Mesa
TO LOWER MONUMENTAL
115
30
230
500
2:115
500
TO LOWER MONUMENTAL
WNP NO. 1 & 4
Howard J. Ashe
WNP No. 2
18
Ringold
Benton
115
FFTF
230
115
Baxter
AEC 351
2-115
White Bluffs
2-115
Benton City
Stevens Drive
Glade
TO GRANDVIEW
Ledbeder
Thayer Drive
Burbank
TO ICE HARBOR
115
115
Franklin
Riverview
Richland
Taylor Flats
115
3-115
Chandler
115
TO WALLA WALLA
115
Angus
115
Badger Canyon
Kennewick
500
Highlands
115
TO BE RETIRED
115
Hedges
2-115/230
230
TO PEBBLE SPRINGS
TO McNARY



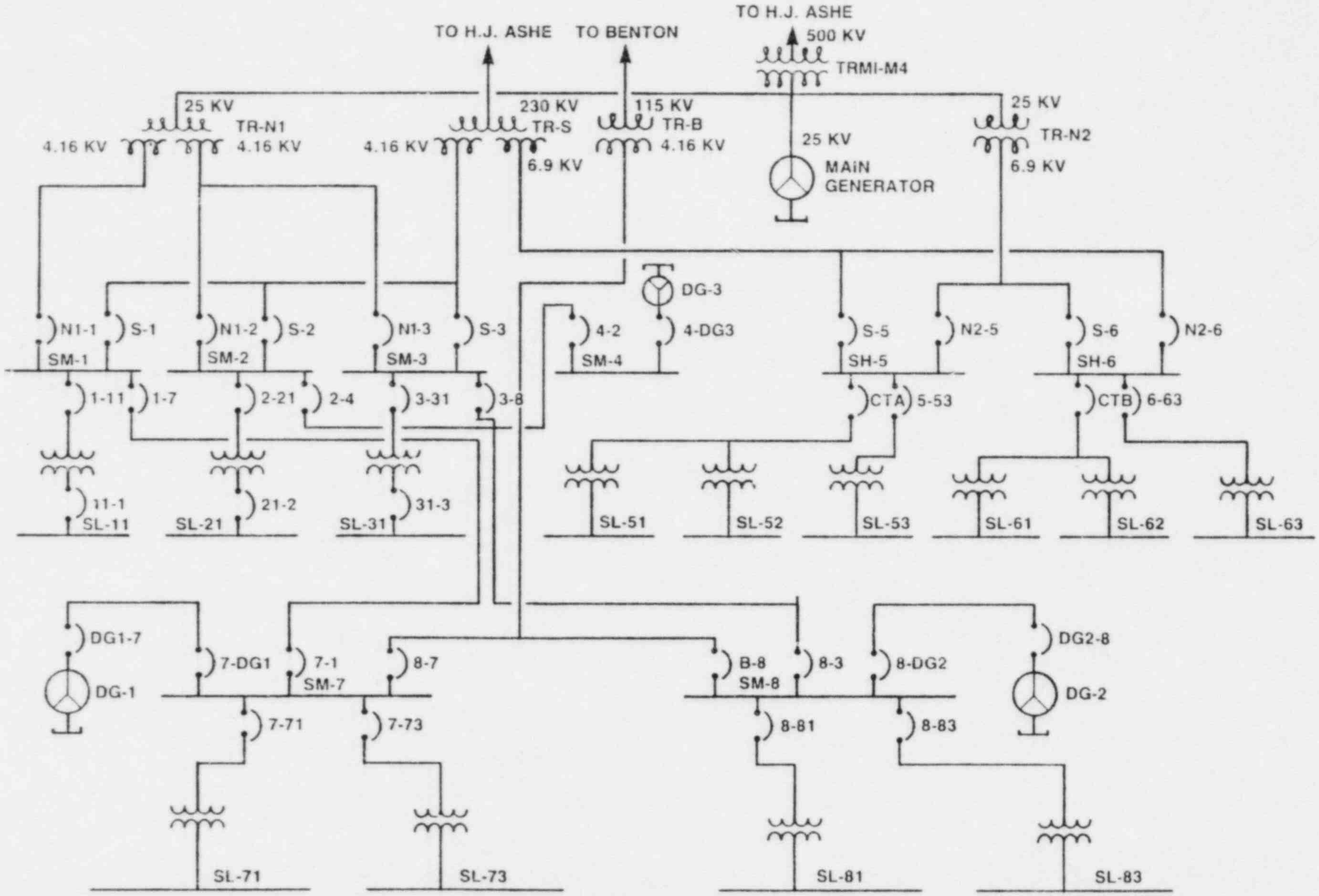
230 KV BUS SECTIONS
SUBSTATION A-8
ERDA-HANFORD 230 KV LOOP
MIDWAY SUBSTATION
SUBSTATION A-4
H.J. ASHE 230 KV SWITCHYARD
WHITE BLUFFS SUBSTATION
230/115 KV
STARTUP TRANSFORMER
WNP-2
115 KV TO RICHLAND
115 KV TO BENTON
821702


115 KV
BENTON
SWITCHING
STATION
MIDWAY
TIE
TAUNTON
LOAD
WHITE
BLUFFS
TIE
FRANKLIN #2
TIE
FRANKLIN #1
TIE
SCOOTENEY
EAGLE LAKE
LOAD
BACKUP
TRANSFORMER
FFTF
WNP-2

821702

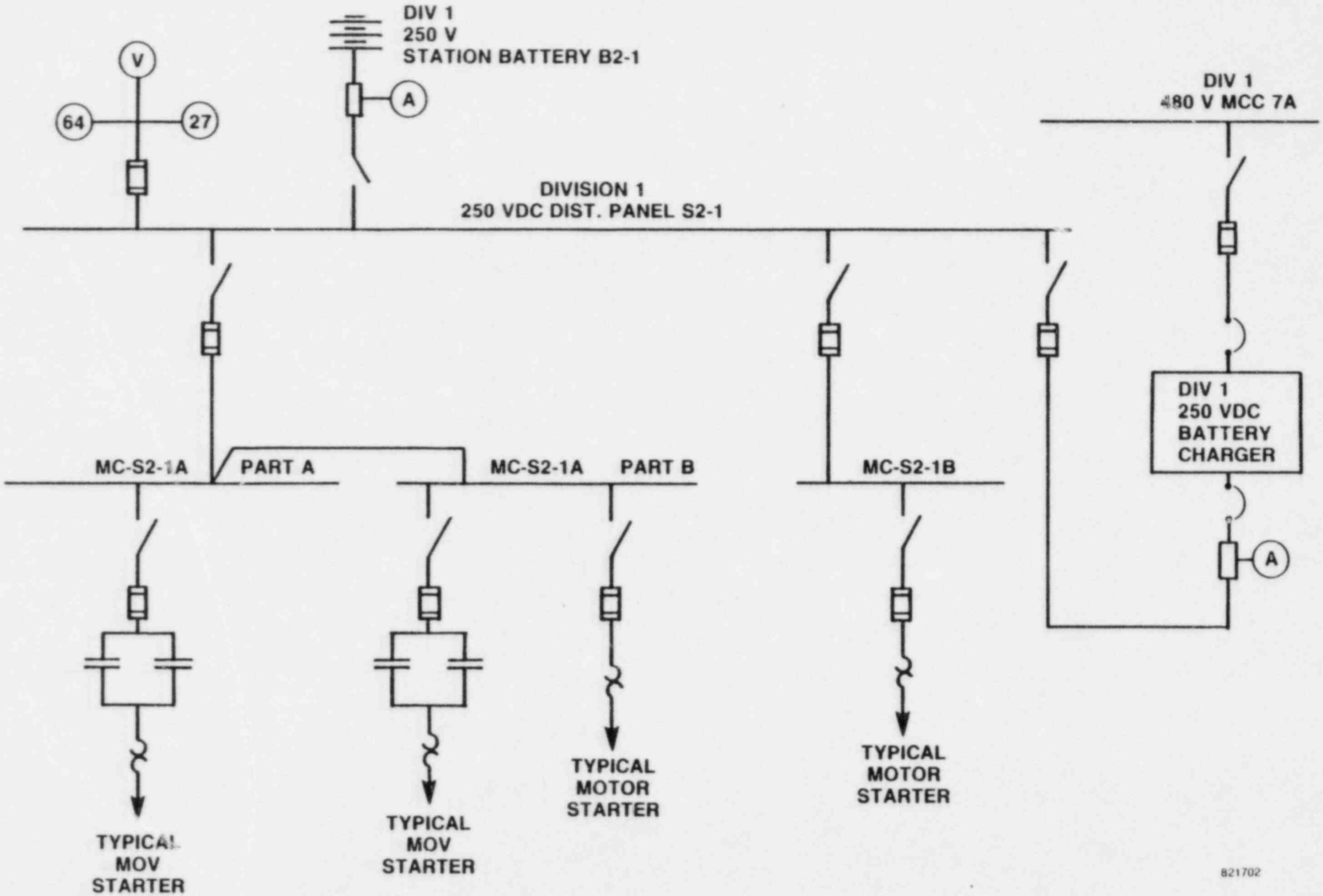


TO BENTON SUB STA.
N
115 KV BACK-UP PWR
BACK-UP SECONDARY
RUNS TO SWITCHGEAR
BACK-UP AUX
PWR TRANS.
REACTOR
REACTOR
101'
144'
TR-M1
TR-M2
TR-M3
TR-M4
TR-5
WNP-2
UNIT NO. 1
TURB-GEN BLDG
500 KV
WNP 2
MAIN PWR
NORMAL AUX.
PWR (2)
RADWASTE
BLDG
250 KV START-UP PWR
SM-1
SM-2
SM-3
SH-5
SH-6
SM-7
SM-8
TO
H.J. ASHE
230 KV
SWYD.
START-UP SECONDARY RUNS TO SWGR
START-UP AUX. PWR TRANS.
821102

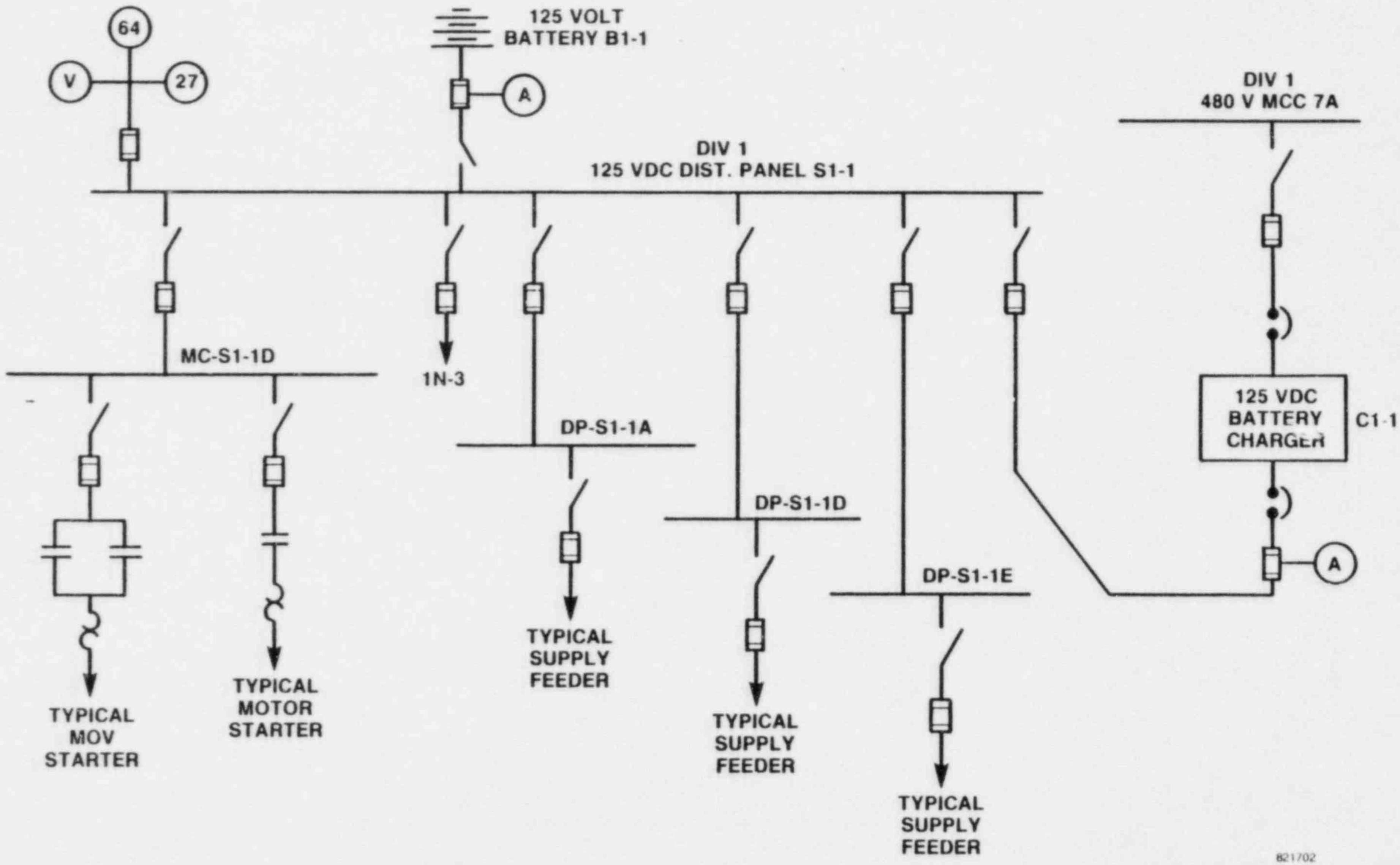


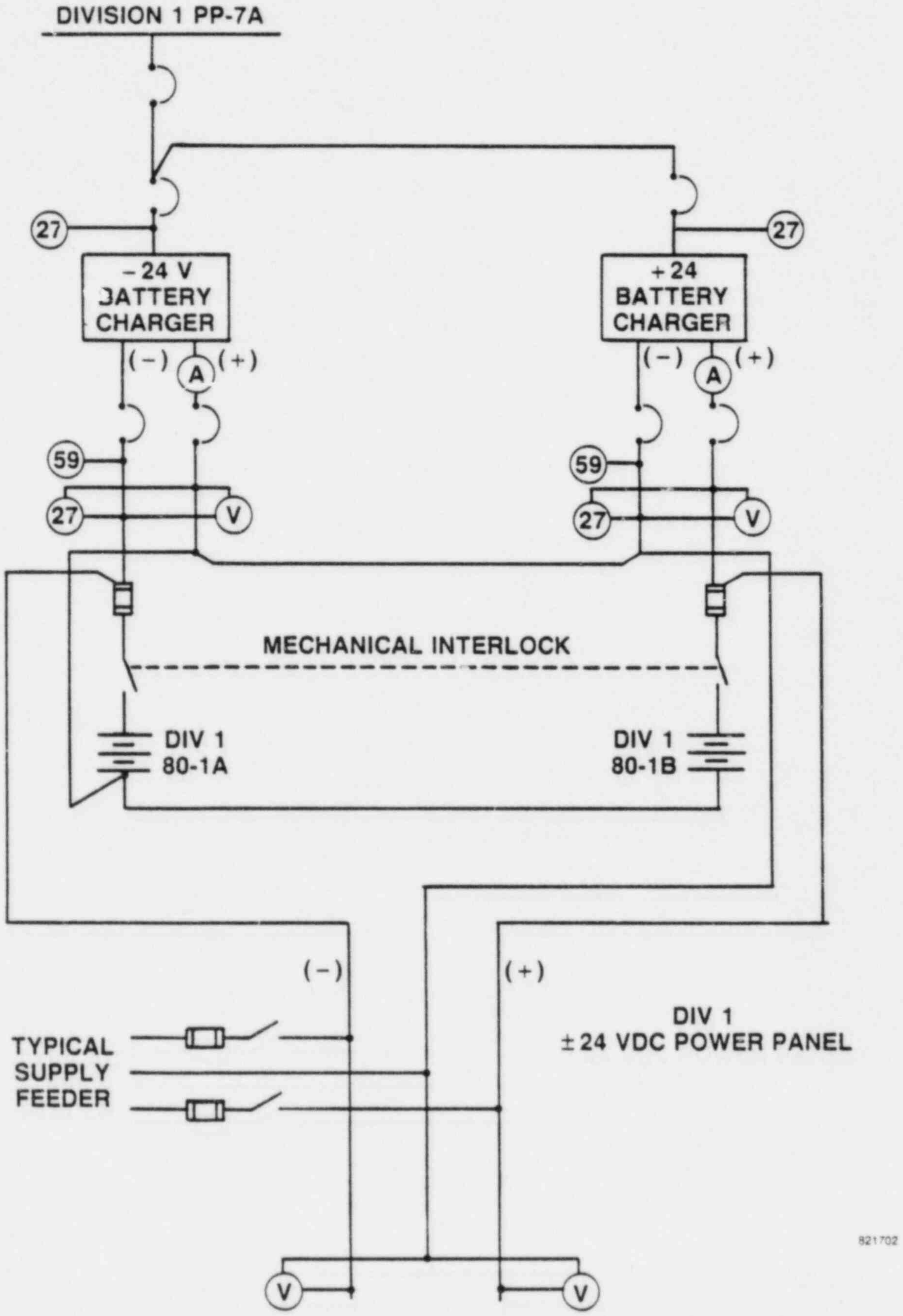
WNP-2 AC DISTRIBUTION

250 VDC ESF DIVISION 1



125 VDC ESF DIVISION 1





DIVISION 1 ±24 VDC SYSTEM

PROBABILITY FOR LOSS OF ALL AC

	PROBABILITY
UP TO 20 MIN	8.3×10^{-7}
LONGER THAN 20 MIN	1.7×10^{-7}
LONGER THAN 60 MIN	6.8×10^{-8}
LONGER THAN 120 MIN	6.1×10^{-9}

PLANT RESPONSE TO TOTAL LOSS OF A/C POWER

PLANT TRANSIENT

- BOTH 230 kv (TR-S) AND 115 kv (TR-B) A/C SOURCES LOST CONCURRENT WITH FAILURE OF ALL DIESELS TO START
- TURBINE-GENERATOR TRIP OCCURS UPON MAJOR GRID DISRUPTION
- REACTOR SCRAMS AND PRIMARY CONTAINMENT ISOLATES
- REACTOR PRESSURE RISES RAPIDLY TO SAFETY RELIEF VALVE RELIEF SETPOINTS
- REACTOR WATER LEVEL INITIALLY DECREASES AS VESSEL INVENTORY IS LOST THROUGH SRV ACTUATION
- RCIC SYSTEM INITIATES ON LOW REACTOR WATER LEVEL BUT LEVEL CONTINUES TO DECREASE AS BOIL-OFF EXCEEDS RCIC MAKE-UP CAPACITY

821760-14A

PLANT RESPONSE TO TOTAL LOSS OF A/C POWER (continued)

PLANT TRANSIENT (continued)

- APPROXIMATELY 10 MINUTES AFTER ISOLATION RCIC CAPACITY ADEQUATE TO RESTORE NORMAL REACTOR WATER LEVEL, LEVEL REMAINS ABOVE TOP OF ACTIVE FUEL
- CRITICAL PLANT INSTRUMENTATION/LOGIC AVAILABLE FROM STATION BATTERIES
- CONTINUED SRV DISCHARGE SUPPRESSION POOL INCREASE POOL TEMPERATURE; LOSS OF DRYWELL COOLING CAUSES CONTAINMENT TEMPERATURE TO INCREASE
- REACTOR PRESSURE AND LEVEL ARE CONTROLLED THEREFORE ADEQUATE CORE COOLING IS PROVIDED

821760-15A

PLANT RESPONSE TO TOTAL LOSS OF A/C POWER (continued)

MITIGATING ACTIONS:

- OPERATORS IMPLEMENT EMERGENCY PROCEDURES TO ENSURE PRIMARY CONTAINMENT INTEGRITY
- OPERATORS INITIATE ACTION TO RESTORE A/C POWER
- OPERATORS ACT TO MAINTAIN RCIC SYSTEM OPERABILITY
- OPERATORS SHED NON-CRITICAL DC LOADS FROM BATTERIES TO PROLONG AVAILABILITY
- OPERATORS PROVIDE FOR CONTINUED SRV ACTUATION
- UPON RESTORATION OF NORMAL/EMERGENCY A/C POWER, NORMAL PLANT RECOVERY PROCEEDS

821760-16A

TOTAL LOSS OF A/C POSITION SUMMARY

- PLANT SPECIFIC ANALYSIS INDICATES TOTAL LOSS OF A/C INCREDIBLE
- ISOLATED HYDRO-BASED GRID HAS AMPLE BLACKSTART CAPABILITY
- WNP-2 HAS TOP PRIORITY FOR POWER RESTORATION WITHIN BPA SYSTEM
- RESTORATION OF A/C POWER WILL OCCUR WITHIN 2 HOURS
- WNP-2 TOTAL LOSS OF A/C RESPONSE PROCEDURES PRESCRIBE MITIGATING ACTIONS
- WNP-2 ADEQUATELY DESIGNED TO SURVIVE LOSS OF A/C INCIDENT

REMOTE SHUTDOWN SYSTEM

MODIFICATIONS TO BE IMPLEMENTED TO PROVIDE CONTROL OF THE ALTERNATE SHUTDOWN MODE

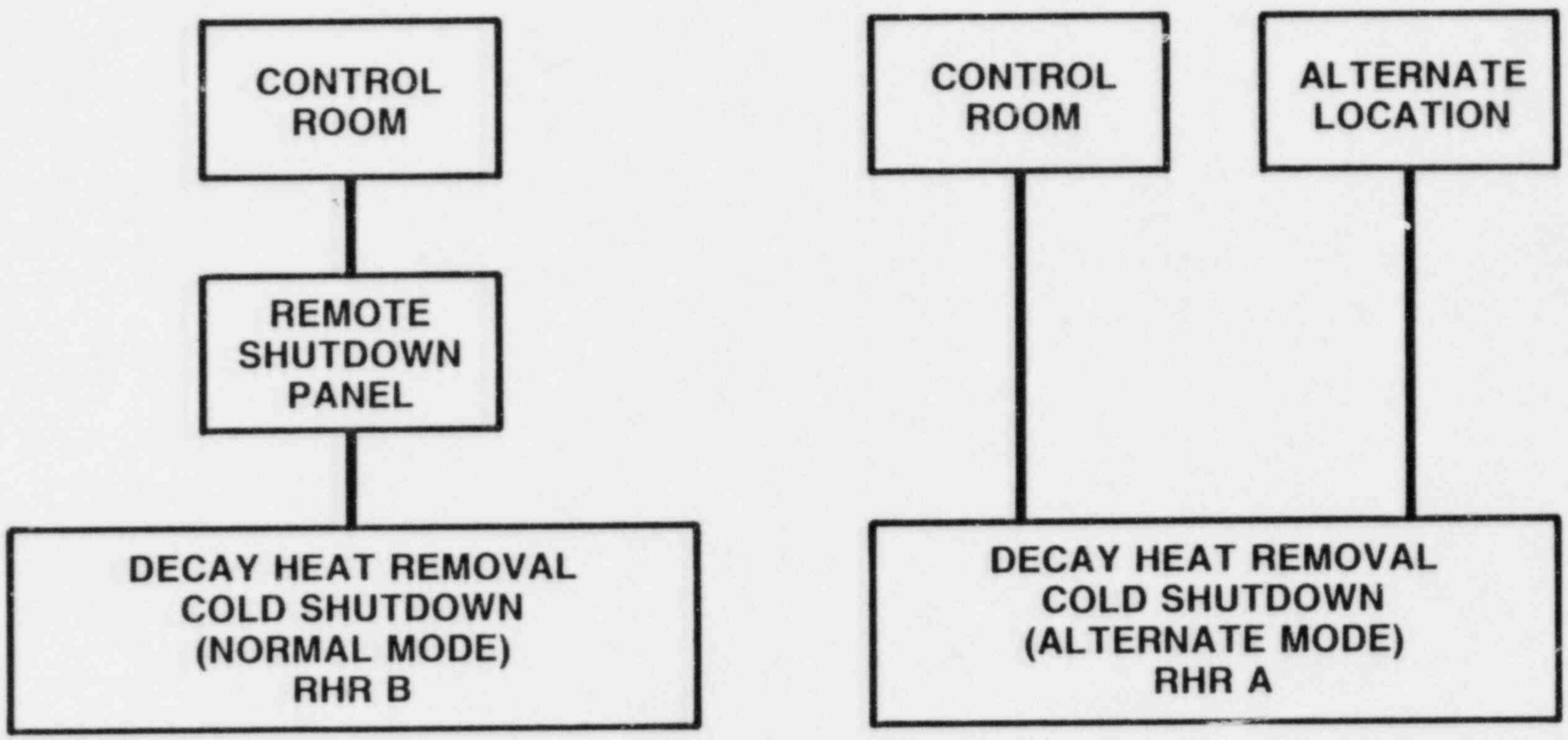
- LOCAL CONTROL SWITCHES AND EQUIPMENT STATUS LIGHTS AT MOTOR CONTROL CENTERS & SWITCH-GEAR FOR VALVE & PUMP OPERATION
- LOCAL CONTROLS AND STATUS INDICATION FOR SRVs
- LOCAL INSTRUMENTATION TO MONITOR CONTAINMENT PARAMETERS & SERVICE WATER FLOW

EXISTING LOCAL INDICATIONS

- REACTOR WATER LEVEL
- REACTOR PRESSURE
- RHR FLOW
- RCIC FLOW

821050-58A

REMOTE SHUTDOWN SYSTEM



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REMOTE SHUTDOWN SYSTEM POSITION SUMMARY

- ALTERNATIVE SHUTDOWN MODE OF OPERATION APPROVED IN LICENSING BASIS
- PROPOSED MODIFICATIONS PROVIDE REDUNDANT REMOTE SHUTDOWN CAPABILITY

8217?2

FIRE PROTECTION

D. T. EVANS

PROGRAM MANAGER,
FIRE PROTECTION ENGINEERING,
WNP-2

821493

WNP-2 POSITION

- FIRE PROTECTION EVALUATION REPORT (FIRE HAZARDS ANALYSIS) DOCUMENTS COMPLIANCE WITH BTP APCSB 9.5-1 (APPENDIX A), AND 10CFR50 APPENDIX R

821540-9A

ANALYSIS FOR EACH FIRE AREA INCLUDED:

- FIRE BARRIERS
- SAFETY-RELATED EQUIPMENT
- CONSEQUENCES OF A FIRE
- RADIOACTIVE MATERIAL
- COMBUSTIBLES AND FIRE LOADING
- FIRE PROTECTION EQUIPMENT IN AREA
- FIRE PROTECTION EQUIPMENT OUTSIDE AREA
- APPENDIX R EVALUATION

MAJOR FACTORS THAT ENSURE DEFENSE IN DEPTH

- PASSIVE FIRE PREVENTION/PROTECTION MEASURES
- FIRE WATER SYSTEM
- WATER FIRE SUPPRESSION SYSTEMS
- STANDPIPE HOSE SYSTEMS
- GASEOUS FIRE SUPPRESSION SYSTEMS
- FIRE DETECTION SYSTEM
- COMPONENT RELIABILITY
- REMOTE SHUTDOWN CAPABILITY
- FIRE PROTECTION/PREVENTION PROGRAM

821702

- **MAJOR FIRE PROTECTION IMPROVEMENTS BEING MADE BY WNP-2:**
  - CABLE RACEWAY SYSTEMS PROTECTION & TEST PROGRAM
  - CONTROL ROOM PGCC MODULES HALON SYSTEM
  - STANDPIPE SYSTEM EXTENSION
  - ADDITION OF 2500 GPM FIRE PUMP SYSTEM

821541-10A

NRC CONCERN

PERFORM SITE VISIT TO:

- VERIFY UNLABELED FIRE DOORS ARE ADEQUATE
- VERIFY LOW FIRE LOADING IN AREAS WHERE AUTOMATIC FIRE SUPPRESSION SYSTEMS ARE NOT INSTALLED

821050-55A

NRC CONCERN (continued)

- COMPLETION OF STANDPIPE CHANGES BEFORE FUEL LOAD -VS- BY 1st REFUELING OUTAGE

SUMMARY

- WNP-2 COMPLIES WITH NRC REQUIREMENTS UNDER BTP APCSB 9.5-1 (APP. A) AND 10CFR50, APP. R.

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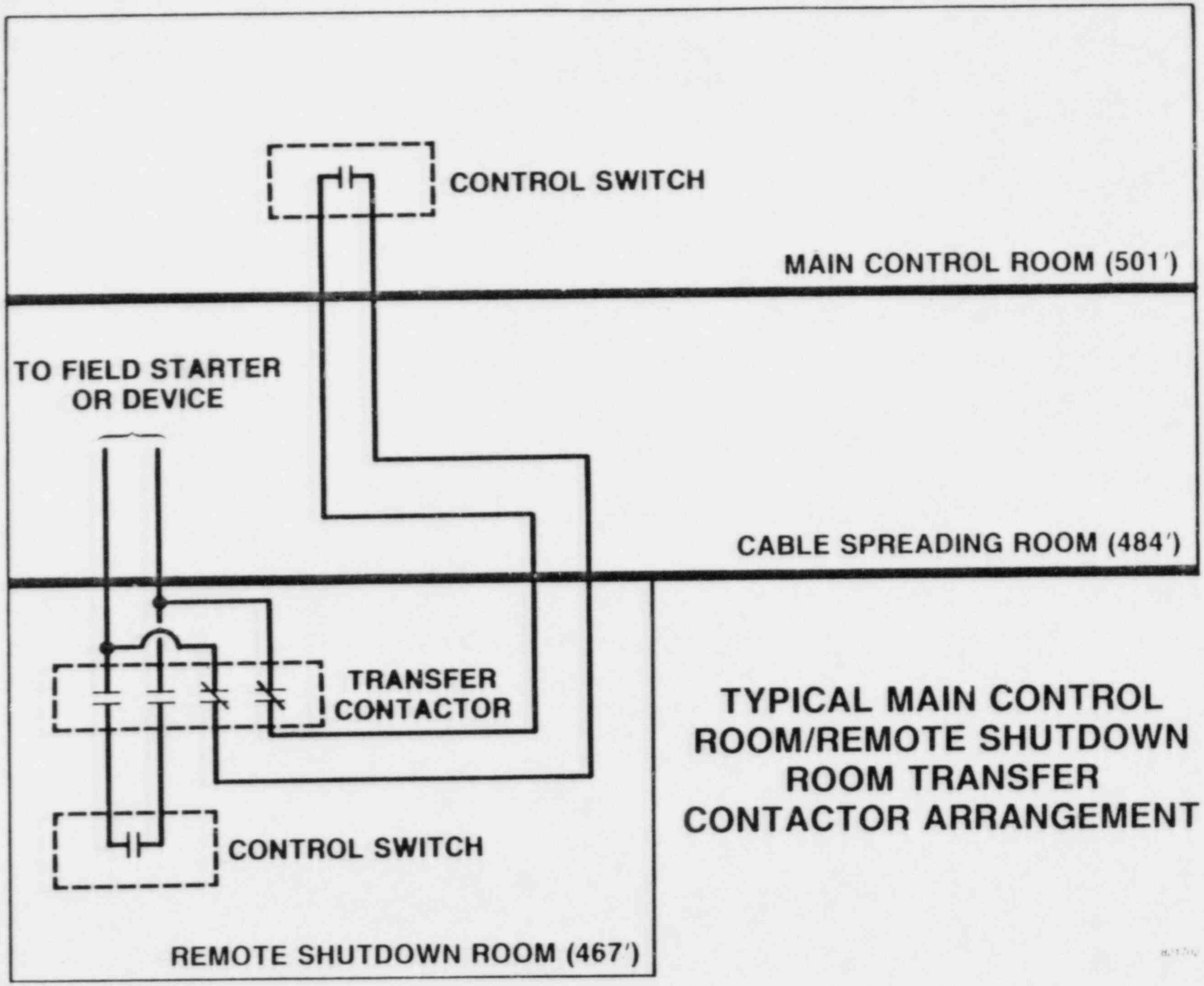


TYPICAL MAIN CONTROL ROOM/REMOTE SHUTDOWN ROOM TRANSFER CONTACTOR ARRANGEMENT

CONTAINMENT SYSTEMS

E. A. FREDENBURG

MANAGER,
CIVIL/STRUCTURAL ENGINEERING
WNP-2

821702

MARK II CONTAINMENT HYDRODYNAMIC LOADS

CONCERN:

HYDRODYNAMIC LOADS RESULTING FROM SRV DISCHARGE AND LOCA WERE NOT PART OF THE ORIGINAL DESIGN BASIS FOR WNP-2.

SUMMARY OF ACTIONS TO RESOLVE CONCERN:

- STRUCTURAL CAPACITY OF THE WNP-2 PLANT HAS BEEN ENHANCED THROUGH EXTENSIVE MODIFICATIONS IN THE WETWELL.
- KNOWLEDGE OF HYDRODYNAMIC LOADING PHENOMENA HAS BEEN GAINED THROUGH COMPREHENSIVE TESTING AND EVALUATION IN THE MARK II PROGRAM (U.S.) AND IN FOREIGN TESTS.
- CONSERVATIVE LOAD DEFINITIONS HAVE BEEN DEVELOPED FROM THE TEST DATA, AND ACCEPTED BY THE NRC.
- FINAL DOCUMENTATION OF PLANT ADEQUACY RELATIVE TO HYDRODYNAMIC LOADS WILL BE PROVIDED IN THE PLANT DESIGN ASSESSMENT REPORT FOR WNP-2.

CONCLUSION:

HYDRODYNAMIC LOADS ARE ACCOMMODATED IN THE FINAL DESIGN OF WNP-2.

PLANT MODIFICATIONS DUE TO HYDRODYNAMIC LOADS

- ADDED HORIZONTAL STIFFENERS IN WETWELL
- ADDED X-QUENCHERS TO OPEN-ENDED MSRVDL'S
- RE-ROUTED MSRV DISCHARGE LINES
- ADDED QUENCHER SUPPORTS
- LOWERED RHR SUCTION LINES
- REVISED PIPE SUPPORTS
- REMOVED OLD DOWNCOMER BRACING SYSTEM AND REPLACED WITH NEW
- ADDED AND UPGRADED PENETRATION STIFFENING
- RELOCATED INTERNAL VACUUM BREAKERS
- ELIMINATED CATWALK AT ELEVATION 472
- REDESIGNED PLATFORM AT ACCESS HATCH
- PROVIDED SHIELDS FOR ELECTRICAL PENETRATIONS
- UPGRADED POOL TEMPERATURE MONITORING SYSTEM

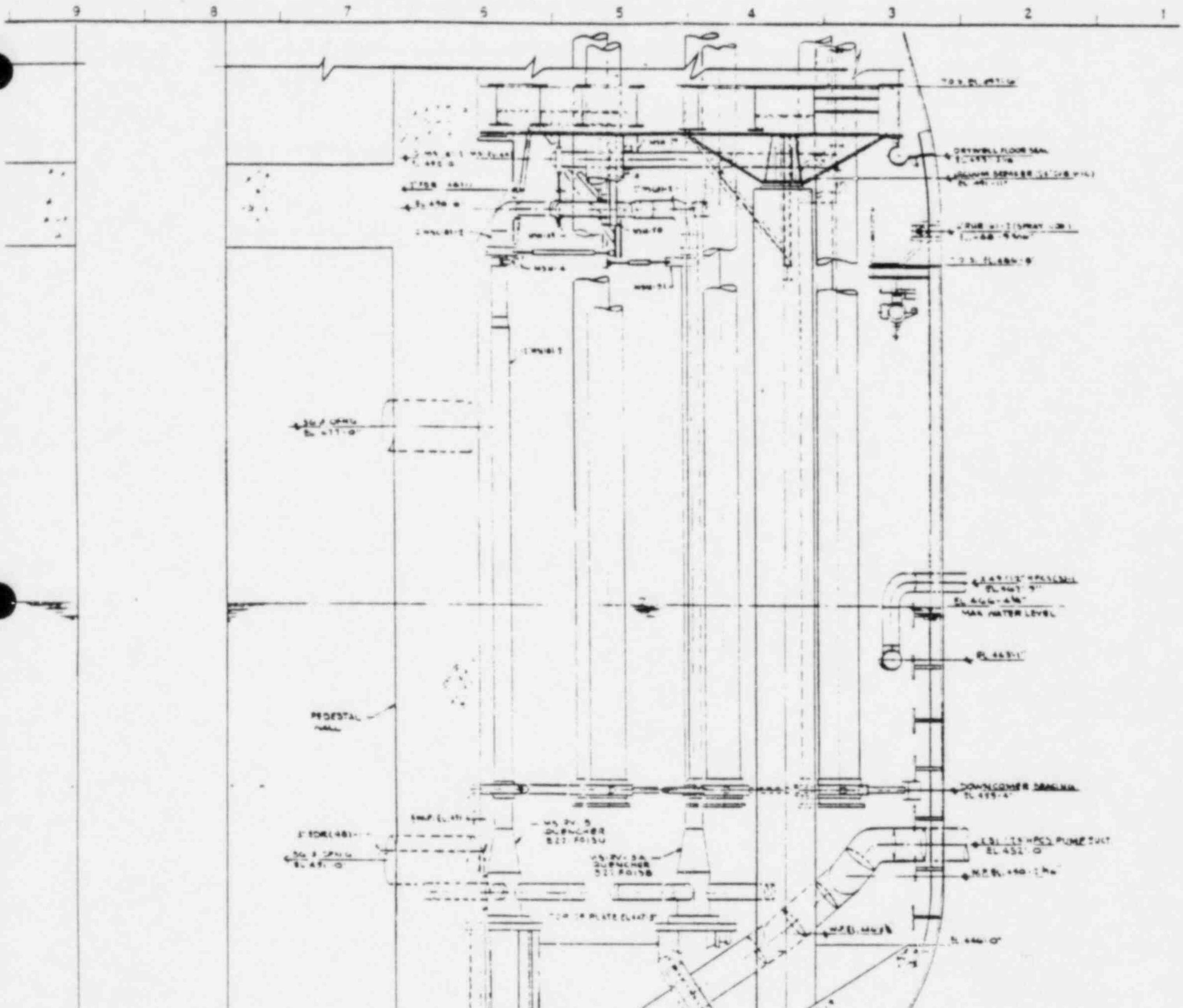
821702

PRINCIPAL DIFFERENCES BETWEEN WNP-2 CONTAINMENT SYSTEM AND OTHER DOMESTIC MARK II PLANTS

- FREE STANDING STEEL CONTAINMENT
- INCLINED POOL BOTTOM
- X-QUENCHERS

821702

TYPICAL CROSS SECTION AT SUPPRESSION POOL



SECTION 4-4

SUMMARY OF DIFFERENCES BETWEEN HYDRODYNAMIC LOAD DEFINITIONS FOR WNP-2, AND OTHER MARK II PLANTS

- WNP-2 COMPLIES WITH NUREG-0808 ACCEPTANCE CRITERIA FOR LOCA-RELATED HYDRODYNAMIC LOADS, EXCEPT AS FOLLOWS:
  - (A) AN ALTERNATIVE PLANT-UNIQUE CHUGGING LOAD DEFINITION WAS DEVELOPED FOR WNP-2.
  - (B) WNP-2 PLANT IS NOT ASSESSED FOR THE CONDENSATION OSCILLATION LOAD AS A SEPARATE LOAD CASE, SINCE CHUGGING LOAD CASE IS SHOWN TO BE BOUNDING.
- A PLANT-UNIQUE SRV LOAD DEFINITION, APPLICABLE FOR X-QUENCHERS, WAS DEVELOPED FOR WNP-2, BASED ON CAORSO IN-PLANT TESTS.

821702

SRV AIR-CLEARING LOAD

- BASED ON REPRESENTATIVE IN-PLANT SRV TESTS AT CAORSO (CONFIRMED BY IN-PLANT SRV TESTS AT TOKAI)
- DEFINED AS PRESSURE HISTORY ON SUPPRESSION POOL BOUNDARY

CHUGGING LOAD

- 7 IMPULSE SOURCES EXTRACTED FROM 4TCO TEST DATA USING FINITE ELEMENT MODEL OF 4TCO SYSTEM.
- IMPULSE SOURCES APPLIED AT DOWNCOMER EXIT THROUGH 3 DIMENSIONAL FINITE ELEMENT MODEL OF POOL AND VENTS.
- WNP-2 CHUGGING LOAD BOUNDS MEASURED CHUGGING PRESSURES IN 4TCO AND JAERI TESTS.
- WNP-2 CHUGGING LOAD WAS SHOWN TO BOUND THE EFFECTS OF CONDENSATION OSCILLATION AT THE BUILDING RESPONSE LEVEL.

821702

VACUUM BREAKER IMPACT LOADS

ISSUE:

VACUUM BREAKERS WILL ACTUATE DURING CHUGGING, DUE TO PRESSURE OSCILLATIONS IN THE DOWNCOMERS, AND DURING POOL SWELL, DUE TO WETWELL AIR SPACE COMPRESSION. RESULTING IMPACT LOADS COULD DAMAGE VACUUM BREAKERS, PROVIDING A SUPPRESSION POOL BYPASS LEAKAGE PATH.

WNP-2 POSITION:

- PROGRAMS WERE UNDERTAKEN IN MARK II OWNERS GROUP, AND ANDERSON-GREENWOOD VB OWNERS GROUP (LIMERICK, SUSQUEHANNA, SHOREHAM, AND WNP-2) TO DEFINE FORCING FUNCTIONS, PREDICT VACUUM BREAKER RESPONSE, AND TO TEST VALVE CAPACITY.
- CALCULATED IMPACT VELOCITIES EXCEED STRUCTURAL CAPACITY OF THE VALVE, AS SHOWN IN ANALYSIS AND TESTS.
- PROGRAM IS CURRENTLY UNDERWAY IN WNP-2 TO ADD DAMPERS TO REDUCE VALVE IMPACT VELOCITIES TO TOLERABLE LEVELS.
- WNP-2 PROGRAM DIFFERS FROM OTHER PLANTS WITH ANDERSON-GREENWOOD VB'S BECAUSE OF DIFFERENCES IN VALVE DESIGN:
  - — BOTTOM PIVOT REAR DISC
  - — NO EXTERNAL SPRING CYLINDER
  - — USE OF MAGNETS IN PERIPHERY OF DISC, COMBINED WITH INTERNAL TORSION SPRING TO PROVIDE PRESSURE SET POINT

VALVE CROSS SECTION (DUAL DISC)