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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

274TH GENERAL MEETING
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Room 1046
1717 H Street, N.W.
Washington, D.C.

Thursday, February 10, 1983

The Advisory Committee on Reactor Safeguards met, pursuant to notice, at 8:30 a.m., Jeremiah J. Ray, Chairman, presiding.

ACRS MEMBERS PRESENT:

JEREMIAH J. RAY, Chairman
JESSE C. EBERSOLE, Vice Chairman
PAUL G. SHEWMON
CARSON MARK
CHESTER P. SIESS
ROBERT C. AXTMANN
DADE W. MOELLER
MYER BENDER
WILLIAM KERR
MAX W. CARBON
HAROLD ETHERINGTON
FORREST J. REMICK
DAVID A. WARD
DAVID OKRENT

ALSO PRESENT:

RAYMOND F. FRALEY,
Executive Director, ACRS

M. NORMAN SCHWARTZ,
Technical Secretary, ACRS

ALSO PRESENT: (Continued)

C. MOON
J. SINISGALLI
M. STIMAC
R. MYERS
J. MECCA
D. HACKING
W. FERGUSON
R. NEWKIRK
R. JONES
H. SUMMERS
T. GREBEL

PROCEEDINGS

MR. RAY: The meeting will now come to order. Can everyone hear me?

This is the 274th meeting of the Advisory Committee on Reactor Safeguards. During today's meeting the Committee will hear reports on and discuss the following: the Skagit nuclear project, Units 1 and 2, the NRC safety research program and budget, the ACRS activities, and the proposed NRC policy statement regarding consideration of severe accidents, and other matters.

The items scheduled for tomorrow and Saturday are listed on the schedule for this meeting which is posted on the bulletin board outside the meeting room and on the bulletin board in the back of the room.

The meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act, and the Government in the Sunshine Act. Mr. Ray Fraley is the Designated Federal Employee for this portion of the meeting, and he's at the table back here beside the screen.

Portions of this meeting will be closed to discuss the matters that relate solely to the internal personnel rules and practices of the agency, and also proprietary information applicable to some projects.

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

We have received one request, from Ms. Billy Guard representing the Government Accountability Project, to make an oral statement on the QA/QC activities at Midland. That statement will be taken later in the day.

I would like to make a brief report of general activities for the Committee.

(Whereupon, at 8:32 a.m., the Committee proceeded into executive session.)

(Whereupon, at 8:45 a.m., the Committee resumed in public session.)

MR. RAY: Okay, we're on schedule. The first item on the agenda for today will be the Skagit/Hanford Nuclear Project, Units 1 and 2, and I will turn the meeting over to the Subcommittee Chairman, Dr. Mark.

MR. MARK: The Skagit Subcommittee met in Hanford on January 24th and 25th. The meeting included a site tour and a rather brief period of presentations.

As you will recall, the Puget Sound Power & Light Company, in spite of Congressman Markey's reference to it as the Puget Power & Sound Company, or Light and Sound, the Puget Sound Power & Light Company, associated with the Pacific Power & Light, with Washington Water & Power, Portland General Electric, have had on the books an application for a power plant to be called Skagit since about 1975 or '76 or '77, somewhere in there. The group managing the application is Puget Sound Power & Light.

They proposed, and the ACRS commented on, they proposed to build a BWR-6 with a Mark III containment at a site on the Skagit River, and that discussion was protracted by both seismic and environmental concerns, to the point that the local authorities came to the end of the period for which a local authorization to proceed

extended and refused to renew it.

So the combination of circumstances led in 1981 to the plan to move the plant away from that site and locate it on the Hanford Reservation. It is the same plant except for changes required by the change of site, which include the fact that the plant was to have been built on rock and will now be built on soil, and that the atmospheric conditions such as humidity are different on the Hanford reservation than they were in the Skagit area. There have been some changes indicated by those considerations.

The plant is similar to ones that we have discussed fairly recently, and in particular Grand Gulf and LaSalle, in at least its nuclear steam supply aspects.

At the Subcommittee meeting we had Dade Moeller and Forrest Remick and myself, and were greatly assisted by our consultants Zudans, Catton and George Thompson from Stanford. There are letters from our consultants in your folder, which include their general comments on the presentation that we received and the problems that they perceived.

Today we will have presentations by the NRC Staff, I believe primarily by Mr. Moon, the project manager for the Skagit application, by Mr. Stimac from

Skagit, who is their manager of licensing, and by Mr. Myers of Scagit, their Vice President for Generation Resources.

There were several questions introduced in our discussion to which the Subcommittee did not get sufficiently full answers from the Staff. I think at least some of those will receive some comments today. These include: more specific discussion of the way in which the population density took account of the presence of about 4,000 or 5,000 workers within 4 or 5 miles or 5 or 6 miles at the FFTF, and the Nuclear Plant No. 2 of the WPPSS, which is building nearby.

We wanted to hear a little more about the interaction or possible interactions, or hopefully lack of interactions, between the power supply grids of these three almost co-located plants; could a power outage at one be applicable simultaneously to the same cause to another, and things like that. We did not have enough detail to see that clearly.

There was something in one of the papers that we had that the Appendix I dose limits might be set aside in the event that there was a need for a dependable source of power. Dr. Moeller wondered just how that reference stood up and was officially recognized or not.

The plant was changed in some ways in being brought from one site to the other. Some of the things done at Skagit were just carried across because of interest in not making changes that were not required, and it is suggested that there is somewhat more conservatism in aspects of the design than there would have been had they planned for this quite different site near the Columbia River, on the Columbia Plateau. As a result, we would like to hear a little more as to which aspects had that property of introducing conservatism because the plant had been moved.

We had a question about in just what way was the operability of the reactor core isolation cooling system assured in the event of the failure of offsite power. The Skagit people have of course been following closely the discussions of the GE supression pool hydrodynamic problems of the Grand Gulf and the LaSalle questions, and they have, we believe, taken considerable and perhaps complete account of the changes which seemed desirable in those cases, and seemed to have considerably, if not entirely, adapted those to their plants.

This will be, I think, the first plant in which there is a preconstruction undertaking to engage in a PRA. Some of us had a question, at least for a

little while during our discussions, as to the extent to which Skagit personnel would participate in the conduct of that PRA, because some of the work will certainly be done by contract. I think they might wish to clarify that aspect for us.

Finally, you will find in your folder and you may have seen separately Congressman Markey's letter to Chairman Palladino asking why we were wasting government time and money reviewing an application up in the Northwest where it is well known that plants were being cancelled instead of started, and that the need for power did not require this in the foreseeable future.

That was answered from the NRC Chairman's office that we had a statutory obligation to respond to such a request for a review. But there comes out of this a possible question, since we're talking here of discussing possible construction permits: At what time might that construction permit actually be taken up and begin to be exercised? Obviously, if it is a large number of years in the future it is rather different than it would be if it were to be in this coming spring.

Relevant to that, on the day after our meeting the Regional Power Planning Council for the region, the Washington State area, issued a report saying they saw no need for any further nuclear installations until at

least the year 2,000 or something that came up in the papers to that effect. And perhaps the comments from the Skagit people will tell us how they view that planning council preliminary comment.

I don't believe it has the effect of law, but it does underline the questions of the time scale on which the construction permit application might be viewed.

I believe that those are all the preliminary remarks that occurred to me to bring out. I would like Dr. Moeller to add to that if he feels it is necessary.

MR. MOELLER: Thank you. I think that is an excellent summary of the Subcommittee meeting.

The only two items that I might add are that as I recall we did discuss the operability of the RCIC in cases of loss of offsite power, and they said they would address that today.

MR. MARK: I mentioned that as amongst the things that we didn't heard that we might hear today.

MR. MOELLER: And the other thing, I raised the question about what their goals were for collective occupational doses. I don't know whether they will be prepared to discuss that or not.

MR. MARK: There is a number from GE that estimates 370 man-rem per plant per year.

MR. MOELLER: Right.

MR. MARK: And where do they get that, and so on.

Forrest, did you have a comment?

MR. REMICK: No. I think you gave an excellent summary. I might just add one perspective. It appears that this plant is much further along at the construction permit stage than most plants because of having been delayed, and there are actually some items of equipment that do exist that are in storage. I think it makes it a little different than the typical plant at this particular stage of licensing.

MR. MARK: That is certainly correct.

Dave, did you have a question?

MR. OKRENT: I looked at George Thompson's comments. Did he make the same comments orally at the Subcommittee meeting?

MR. MARK: Not in that length, but certainly to that point.

MR. OKRENT: Does the Staff agree or disagree, or did they comment on his comment as to what it paid to look for in further field studies?

MR. MARK: I don't recall a Staff comment on that point.

MR. OKRENT: I guess that would be worth

finding out.

MR. MARK: The Staff did take the position that the only direct examination of that, what is it called, something junction monocline.

MR. STIMAC: The May Junction monocline.

MR. MARK: May Junction monocline. There had been a rotary drill exploration to some extent of that formation. There have been geophysical indications from it.

Neither of these are viewed by the Staff as capable of making a firm comment on the possible faulting in that rock, and they thought that core drilling was the only way to do that. George pointed out, of course, that by core drilling you do not expect to see very small things, but it is only rather large things that ought to be of concern in estimating the earthquake hazard.

That was his comment, and the Staff of course may want to elaborate on that when they appear. There is a question there that needs to be answered. I think George has a very clear and good point, that we shouldn't say we're going to prove that there is no fault of any kind, but you might expect to prove that there is no fault that we should take as a matter of concern.

MR. OKRENT: Yes. In other words, when I read the SER before seeing his comment, it was hard for me to tell what criteria they were going to use. And he has sort of suggested in a sense again that you need some criterion, namely --

MR. MARK: If you had to set the minimum for the SSE, you would not go as high as .35. .35 was accepted as the figure to apply to Skagit, which is a more likely place in this.

MR. OKRENT: Well, he is not unhappy with that, for reasons that he gave. In fact, I think that part is in fairly good shape. It's just the exploration question.

MR. MARK: I believe the Staff will comment on that.

MR. EBERSOLE: On this question, one of the popular things now is one-step licensing. It would seem that this plant would almost be in an ideal position to develop its really completely detailed construction drawing.

MR. MARK: I think it would be hard to find a plant where there had been more preconstruction permit study than on this one.

MR. EBERSOLE: Yes, that's what I'm saying. It would be possible to examine the possible success of

that sort of mode by looking into how deeply the Applicant intends to go into finished drawings in detail, and whether or not that would be possible.

MR. MARK: Well, you could almost buy them from one of the other plants, except for the soil handling.

MR. EBERSOLE: That's one way to get them.

MR. MARK: If there are no other questions, then, I would call on Mr. Stimac of Skagit to give us a brief plant description, hoping that things of that sort will not need a lot of introduction as if they were brand new, because many of us had a chance to see it seven or eight days ago.

(Slide.)

MR. STIMAC: Thank you, Dr. Mark. Mr. Chairman and members of the Committee:

I'm Mike Stimac, the Manager of Licensing and Regulation with Puget Sound Power & Light Company, the sponsor of the Skagit/Hanford Nuclear Project.

We are pleased to be here today. This meeting is a very important milestone in our licensing process, and a favorable endorsement from you is a prerequisite to our commencement of safety hearings and the orderly progress toward receipt of the construction permits from the project.

However, recent developments regarding regional power planning in the Pacific Northwest have caused us to request that our safety and environmental proceedings be temporarily suspended. Mr. Myers, Vice President, Generation Resources, with Puget Sound Power & Light Company, will address this matter later in the beginning of his presentation.

(Slide.)

This slide shows the agenda that we will follow today. Following my introduction and the NRC Staff presentation, Mr. Myers will address the project schedule, organization and management; Mr. Mecca will discuss site characteristics briefly; and finally Mr. Hacking will address design considerations.

Notebooks that contain the agenda and the copies of each presentation have been distributed to each of you, and the slides for the balance of my discussion can be found behind the introduction tab. I will be covering the federal licensing history for the project and then briefly describing the site and the project layout.

The Skagit/Hanford Nuclear Project is jointly owned by four investor-owned utilities in the Pacific Northwest. In addition to Puget, those are Portland General Electric, Pacific Power & Light Company, and the

Washington Water Power Company.

Assisting Puget with the design and licensing of the project is NESCO, the Northwest Energy Services Company. The architect-engineer is Bechtel Power Corporation.

The project will consist of two nuclear units. The NSSS' are BWR-6 of the basic 251 GESAR design. The containments are Mark III, making the unit similar to Grand Gulf, a project which was recently reviewed for an operating license.

Before proceeding further with my remarks, I would like to take a minute to introduce several of our principal management personnel in attendance today. Immediately to the left of the Applicant's table is Robert Myers, Vice President, Generation Resources, at Puget Sound Power & Light Company. Mr. Myers currently has the overall responsibility for this project and has been associated with it in various capacities since its early phases in 1973.

Seated at the Applicant's table i[illegible] Grebel, Manager of Licensing at NESCO. Mr. [illegible] is my counterpart in that organization. Others are: Warren Ferguson, President of NESCO; Frank Spangenberg, Project Manager, NESCO; Dennis Hacking, Project Engineer, NESCO; Jim Mecca, Manager of Safety, NESCO; Howard Summers,

Project Manager, General Electric; Bob Jones, Project Engineer, Bechtel; and Bob Newkirk, Senior Staff Engineer with Puget Sound Power & Light.

(Slide.)

This slide provides a synopsis of the federal licensing process leading to our current status and serves as a reminder of the reviews that have already been completed for this project. As you will see, we have been in the licensing mode for a considerable time.

The Skagit/Hanford Project has a history that dates back to the public announcement in January of 1973. After completing the local permitting process and obtaining a rezone agreement with Skagit County, the location of the original site, we turned our attention to the state and federal licensing requirements.

In August of 1974, we filed our environmental report, preliminary safety analysis report, chapter 2, and application for construction permits and operating licenses with the Nuclear Regulatory Commission. The application and ER were docketed in September. The balance of the PSAR was submitted in December and docketed in January of 1975. The final environmental statement was issued in May and hearings on site suitability issues and environmental matters began in

mid-July.

In September 1977, the safety evaluation report was issued and our ACRS Subcommittee meeting was held. We then proceeded on to an appearance before 211th meeting of the Advisory Committee on Reactor Safeguards on November 4th, 1977. Two ACRS letters were issued pertaining to the Skagit nuclear power project. The November 15 letter dealt with the regional tectonics of the Pacific Northwest, and the November 18 letter with the project itself.

Over the next year, efforts continued on the resolution of outstanding items identified in the SER. In October 1978, SER Supplement No. 1 was issued. Supplement No. 1 included the ACRS reports relative to the Skagit project and documented resolution of all significant items except geology and seismology.

On March 28th, 1979, the Three Mile Island accident occurred. As a construction permit applicant, our licensing process was suspended by the NRC pending the establishment of licensing policy reflecting the lessons learned from the accident. We actively participated in the NTCP, the Near-Term Construction Permit Group, and assisted with the efforts that led to that to the NTCP rule as defined in 10 CFR 50.34(f), Parts 1 through 3.

Meanwhile, we were approaching a key date relative to the local zoning matter. An article of the rezone agreement which I mentioned earlier required receipt of the construction permits by December 31, 1979, or the zoning would revert back to its previous designation.

In November 1979 the Skagit County Commissioners, based on the results of an advisory ballot, voted not to renew the agreement. With the local agreement no longer valid and the geology and seismology still unresolved, the original Skagit site began to be in doubt.

In view of the time required to resolve those matters, the decision was made in July 1980 to move the project to the Hanford Reservation. Our application was amended accordingly in September.

Regarding TMI and the NTCP group, the NRC Staff initiated a program to establish TMI-related requirements for CP and ML applications. The requirements proposed were described in NUREG-0718, licensing requirements for pending applications for construction permits and manufacturing licenses, which was issued in March 1981, and subsequently in the proposed rule which was based on NUREG-0718.

In consideration of the comments received, the Staff made some revisions in the requirements and proposed a final rule to the Commiossion on May 27th, 1981. NUREG-0718 was revised to be consistent with the requirements of the final rule. The Commission authorized the Staff to proceed with the review of the pending CP and ML applications on the basis of the positions contained in NUREG-0718, Rev. 1, and the final rule.

We responded to the positions in NUREG-0718, Rev. 1, by Amendments 21 and 22 to the PSAR. In October 1981, SER Supplement No. 2 was issued concluding that the information supplied in Amendments 21 and 22 complied with the NRC's positions in NUREG-0718, Rev. 1, and the pending rule.

In December 1981, PSAR Amendment 23 and ER Amendment 4 were filed updating those documents to reflect the Hanford site location. The draft environmental statement was issued for the Hanford site in April of 1982. The NRC issued SER Supplement No. 3 in December which provided an evaluation of the site relocation.

Supplement No. 3 identified only one outstanding item. That item is the issue of the adequacy of field investigations related to the May

Junction monocline. The NRC Staff recommended post-CP confirmatory work as a condition to the license. We have agreed to conduct that work.

As indicated earlier by Dr. Mark, our subcommittee meeting was held in Richland just a little over two weeks ago on January 24 and 25, and that brings us to today's meeting.

Are there any questions before I move on to a brief description of the site and the project itself?

MR. MOELLER: Could you clarify for me your earlier statement regarding the suspension of the safety and environmental review, or will we hear more later?

MR. STIMAC: You will hear more later. Mr. Myers will address that matter at the beginning of his presentation.

MR. MOELLER: Okay, thank you.

(Slide)

MR. STIMAC: These next two slides show the location of Hanford and our project on the reservation. Other installations in the area include the N reactor, FFTF, and the Washington Public Power Supply System, Units 1, 2 and 4.

(Slide)

The site, which is about five miles to the west of the supply system units, will consist of 640

acres to be purchased and 560 acres which will be under lease agreement. The units will be oriented in an east-west direction. Cooling water will be supplied from the Columbia River. Water will be withdrawn and discharged to the river near the old Hanford Town site approximately eight miles to the northeast.

The main access routes are Route 4 and Route 10. Power will be fed into the Bonneville power administration grid, approximately 3.2 miles to the northeast of the project, using four single-circuit 500 KV lines. The exclusionary boundary for the project, as shown in this figure, is oval in shape and defined by a line which is one mile from the line connecting the reactor centers.

(Slide)

The Skagit Nuclear Power Project will consist of two units utilizing BWR-6s and Westinghouse turbines. Each unit will have a net electrical output of 1275 megawatts electric. My last slide shows a graphic representation of the project looking to the southeast, with Unit 1 in the foreground. Major structures shown are the reactor building, the turbine building, the auxiliary building, the fuel building, the control building here (indicating), and the mechanical draft cooling towers.

That concludes my introductory remarks. Are there any questions?

MR. MARK: There is on that picture a fairly comprehensive water storage arrangement. You might comment on that because the fact that you are bringing water from eight miles away raises a question as to whether that can be interrupted.

MR. STIMAC: Associated with each of the units is an ultimate heat sink. For Unit 1 the ultimate heat sink is in this area, and the towers associated with the heat sink are shown here (indicating). Most of the structure is below grade. That serves as the emergency cooling water should we lose the main source -- that is, the pipelines that come in from the river to the northeast.

MR. MARK: And the water that is in that reservoir is good for how long?

MR. STIMAC: Thirty days.

MR. SHEWMON: This is roughly how many cubic meters, or gallons, or whatever units you prefer?

MR. STIMAC: I don't remember that exact number. Mr. Grebel, could you check on that?

MR. GREBEL: Yes.

MR. SHEWMON: I would like to inquire, to what BWR owners groups do you belong to? Or is there just

one? And if so, what topics are under active study?

MR. STIMAC: We belong to or participate in a number of groups. We have been tracking all of the issues as they have progressed along related to the BWR-6. Hydrogen control owners group.

MR. SHEWMON: You said "tracking." I was thinking "cracking." Is there still a pipe cracking study group? Before the day is over I would like to know what you are doing with regard to primary piping and stress corrosion cracking control.

MR. STIMAC: We will check on that.

MR. BENDER: I understand that Bechtel is the architect engineer for this plant. What plant is it nearest like that Bechtel has engineered?

MR. STIMAC: The Grand Gulf units.

MR. BENDER: Is the team that did the Grand Gulf design the team that is doing this design?

MR. STIMAC: No.

MR. BENDER: Thank you.

MR. RAY: I have a question.

MR. STIMAC: Yes.

MR. RAY: On Mr. Bender's question, is the team that is assigned to this design by Bechtel one from earlier experiences on other plants? Or are they new personnel?

MR. STIMAC: They are experienced personnel.

MR. RAY: In design of similar plants elsewhere? I am talking about the Bechtel personnel now.

MR. STIMAC: Yes. We could provide the specifics on that.

MR. RAY: I just want to make sure that it is not a group of novices that have been hired and assembled for just this project.

MR. STIMAC: No, sir, they are not.

MR. RAY: That has happened in the past. Will some of the other presenters following you talk about the bulk power system stability questions that were mentioned by Dr. Mark in his presentation?

MR. STIMAC: Yes. That will be covered under the design considerations.

MR. RAY: Will someone discuss also the arrangement of the four lines that I presume are going out over this channel marked on your preceding slide as the transmission corridor?

MR. STIMAC: Yes.

MR. RAY: Thank you.

MR. AXTMANN: Is the 30-day supply of water enough for both reactors?

MR. STIMAC: Each reactor, each unit has an ultimate heat sink.

MR. AXTMANN: Yes.

MR. STIMAC: And each heat sink is sufficient for a given unit.

MR. AXTMANN: For the 30 days?

MR. STIMAC: Yes.

MR. SHEWMON: And 30 nights.

[Laughter.]

MR. STIMAC: Mr. Grebel.

MR. GREBEL: Terry Grebel, Northwest Energy Services Company.

You earlier about the volume and the capacity of the ultimate heat sink. That is 9 million gallons.

MR. SHEWMON: Thank you.

MR. EBERSOLE: Let me ask a question. Dr. Mark said that you could practically go out and buy the drawings. Is it, in fact, your intent to go down to Grand Gulf and get a couple of trainloads of drawing details and essentially duplicate this plant? Or are you going to make your own unique set of drawings? You know, there are thousands of drawings that you have to make for plants.

MR. STIMAC: I am not sure which approach we will use. We certainly take advantage of industry experience. If we could use the drawings, if they were

applicable, then I would imagine we would try to do that.

MR. EBERSOLE: Thank you.

MR. BENDER: I would like to follow up for just a moment on that point. I think somebody said that you had had a great deal of time to get the plant design completed. Is the plant design completed?

MR. STIMAC: No.

MR. BENDER: What fraction of it is completed?

MR. STIMAC: About 60 percent.

MR. BENDER: Is the fraction that is completed the nuclear island, the balance of plant, or what? Or will I hear it later? If I will hear that later, I won't ask the question now.

MR. STIMAC: You will hear more about that later.

MR. BENDER: I will just wait, and hopefully whoever talks about it will tell us a little bit about that.

MR. STIMAC: Yes, sir.

MR. MARK: Thank you, Mr. Stimac.

Mr. Moon of the Staff will tell us about the open items as the Staff sees them.

(Slide)

MR. MOON: Good morning. My name is Calvin Moon. I am the representative of the NRC Staff and the

licensee project manager for the Skagit/Hanford review.

As has already been indicated, there have been basically three phases of review: the review for the original Skagit site, which resulted in safety evaluation reports and Supplements '77-'78; the review for the TMI requirements; and then finally the review associated with the change of site.

I have been asked to discuss open issues and commitments as one topic, and then the Staff conclusions.

(Slide)

With the commitment that Mr. Stimac mentioned on the additional data for the May Junction monocline, the Staff considers that with regard to a decision for issuance of a construction permit we now have no outstanding issues.

My next two slides, then, will be a list of principal review issues in regard to the change of the site location. I will try to go through briefly this list and indicate some of the commitments. Then I will have a last slide to summarize the Staff conclusions.

With regard to Dr. Mark's list of items for which he feels he would like to hear more information, I will not try to cover all of those in detail. I believe we have Staff members present that can respond to the committee's interests, either after I finish or later on

in the day after the Applicant finishes his discussion.

(Slide)

Originally the Applicant proposed a 1.9 mile exclusionary radius. We were not satisified initially with the plans to obtain the authority to control activities within that area according to the regulations. We now feel that the Applicant has made sufficient commitments to effect an agreement with the Department of Energy for the control of activities in the exclusion area.

During the course of this interchange, the exclusion area has now been reduced from 1.9 to 1 mile. The Staff looked at potential hazards from nearby facilities. One was transportation of ammonia down highways. The Applicant presented a study and the Staff agrees that the risk is not sufficiently great so as to require protection against the ammonia spill that would be postulated.

Near the site, I think on the order of two to three miles, there is a proposed toxic chemical dump. This has gotten labeled by the term "extremely hazardous waste dump." The Staff has looked at this and discussed it with the Applicant. There are questions as to what eventually will be stored in that dump. The Applicant has made a commitment to follow this and, as the design

proceeds and the knowledge of what goes into the dump becomes known, the Applicant then will provide protection for the control room and appropriate monitors if needed.

The SER did not specifically address potential hazards from the FFTF facility. While it was not mentioned, the Staff had earlier looked at this question and had compared the distance of the Skagit/Hanford site to the FFTF and compared it with the distance to the boundary of the reservation, and had not perceived any need for special provisions on the Skagit/Hanford site for the facility, but we do have people here that can discuss this in more detail.

In meteorology the Applicant relied on the data from the WNP-2 site. With the move of the site, the Staff did not redo all of the accident calculations in Chapter 15. We did look at them and assured ourselves that even with the reduction of the exclusion area, the doses calculated for the original Skagit site clearly would not be exceeded at the Skagit/Hanford site.

One thing that we did not bring up in the subcommittee meeting was the question of the design basis tornado. The SER states that the tornado would have the design parameters for a Class 1 region. In the errata sheet which I have attached to your handout, it

is shown that that should have been Class 2. This is acceptable because basically the Staff's Reg Guide 1.76 shows this site as being in a Class 3 region.

We did review the hydrological parameters for the site. This did lead to different roof loads due to the probable maximum precipitation due to snow loads. On the ultimate heat sink, the vendor I believe has not been selected on this. The Applicant, later on when this becomes more final, will provide design data for the Staff to review. The Staff does not anticipate that there will be any difficulty in the Applicant meeting the detailed requirements.

On geology the WNP-2 review looked at the regional geology, and that has been basically applicable to this site. In addition to those investigations, the Skagit/Hanford applicant looked at the site geology and the near site geology. As has already been discussed, there is a question in cojunction with the May Junction monocline. The Staff feels that additional subsurface data are needed.

A program for obtaining this additional data was earlier discussed with the Staff, and I think general agreement was reached as to the nature of the additional work that should be done.

On seismology, the SSE is .35 g, which was the

same as for the Skagit site. The OBE is .175.

MR. MARK: In that slide you refer to an extremely hazardous waste dump.

MR. MOON: Yes.

MR. MARK: Is that really expected to be an extremely hazardous affair? Or is it just a waste dump for materials which if uncontrolled would be unhealthy?

MR. MOON: I think it is categorized as a toxic chemical dump. Joe, are you here?

MR. SINISGALLI: Yes.

MR. MOON: Joe Sinisgalli perhaps can address this in a little more detail for you.

MR. MARK: I am just again questioning the fact that if it is indeed extremely hazardous, then something should be done about it; not just listed.

MR. MOON: Right.

MR. SINISGALLI: The State of Washington environmental report for the proposed extremely hazardous waste dump identifies that such things as PCBs and other toxic materials would be stored in approximately 100 gallon drums. Their environmental report does not specify any particular type of chemical limitation. It is approximately 2.5 miles from the control room air intakes.

We have identified that we have to maintain a

surveillance as to what is being placed at this facility in case some airborne toxicity materials were being placed there. The present proposed list of materials are highly toxic only in the ingested pathway, and not in the inhalation pathway.

MR. EBERSOLE: Does the interrelationship between this sort of thing enter into the tornado picture? Can these be lofted up and plastered against the reactor? You also refer to this being in a Class 2 area. I am unfamiliar with tornado classifications. Does that pertain to the probability or the violence of the tornadoes that one might have here?

MR. MOON: I believe it is primarily the severity. In other words, there are differences in the wind speed and the rate of pressure drop.

MR. EBERSOIE: When one looks at a waste dump, does one go so far as to say I'm going to loft this pile of material up and splatter it all over the plant or some other place?

MR. SINISGALLI: At this juncture the particulars of the facility have not been identified. The proposal is that the 100 gallon drums would be in trenches and would be somehow protected. At this stage the extremely hazardous waste facility has not been finalized as to whether it would be actually there, nor

have the detailed designs for storage been made.

MR. BENDER: Is there a commitment to a subsurface kind of storage area? Is that the idea?

MR. SINISGALLI: No, it is only a proposal depending on the toxicity of the particular materials.

MR. MARK: This would be monitored, licensed or approved or not by the State of Washington authorities and not by the NRC; is that right?

MR. SINISGALLI: We would anticipate monitoring at the operating license stage, and most likely putting a licensing condition for continued monitoring if it is still an open issue as to what types of materials might be housed there at any future time.

MR. MARK: But it would still be something on which the State of Washington would lay down the original prescription?

MR. SINISGALLI: Right.

MR. SHEWMON: The argument for this is that that would increase the probability of core melt if not properly managed? Or just why is it the NRC is getting wrapped up in this?

MR. SINISGALLI: We are concerned about control room habitability in the event the toxic material becomes an inhalation pathway, which is potentially hazardous, in order to be sure that the

control room operators would not be affected in their efficiency or their survival.

MR. SHEWMON: It sounds a little tenuous to me.

MR. SINISGALLI: I fully agree. That's 2.5 miles.

MR. MOELLER: You mentioned 100 gallon waste containers. As I recall, a barrel is 55 gallons.

MR. SINISGALLI: Their proposal was about 100 gallons for a single container.

MR. MOELLER: Is this some kind of special container they are designing?

MR. SHEWMON: They bring them up from Texas.

MR. MOELLER: Is this a special new kind of container or something?

MR. SINISGALLI: No, I cannot say that. They just simply stated "up to." It's a round number.

(Slide.)

MR. MOON: With the change of site, the new site is a soil site and with considerable activity during our review involving the question of the subsurface materials for the foundations of the building. The Applicant has made commitments to provide the Staff with reports on test fills for the Staff review and approval, and I believe additional quality control measure. On masonry walls the Applicant has

committed not to use any masonry walls in the safety-related buildings. With the change of site, the climate is different. There are dust storms that were not prevalent at the other site. There is a potential volcanic ash question at the site as well as at the previous site.

Part of our review had to do with measures for operating in these environments. During our review, some small changes were made in plans for operation of some of the air cleaning equipment for some of the buildings. The Applicant, with the -- Excuse me?

MR. BENDER: Just as a matter of perspective, the WPPSS plants are in the same general areas. Are there any significant differences in the environmental exposures that arise in those particular plants as compared to those installations that presumably have construction permits?

MR. MOON: I believe it is the Staff's understanding that the conditions would essentially be the same.

MR. BENDER: So unless we don't like those, there wouldn't be any reason not to think that this one was all right, too?

MR. MOON: The environments, I think, are the same. Whether or not the provisions in the facility for

accommodating those conditions are identical, this I do not know. I think they are similar.

MR. BENDER: I see. Thank you.

MR. MOON: The Applicant chose to submit a cost-benefit analysis to satisfy Appendix I, whereas for the earlier review he had used the guidelines that were permitted by the option. Because he did this, we did redo our Appendix I review. The Applicant did look at alternatives, or "augments," if you will. The Staff itself looked at additional ones and we now conclude that the Appendix I requirements are satisfactorily met for the construction permit stage.

Of course, there has been a new emergency planning rule. Our emergency planning review has been updated. I believe that is discussed in Section 13 of the SER supplement. We also completely updated our review of USIs, or unresolved safety issues. It shows up as Appendix E in Supplement 3.

We determined that there were 17 items that were applicable to Skagit/Hanford. Eight of those are items that the Staff has determined generic resolutions on. For those issues we do have commitments from the Applicant to implement the generic resolutions specifically in the Skagit/Hanford plant.

The other nine issues, we have provided a

discussion as to the basis for going forward and issuing a CP even though the items are identified as unresolved safety issues.

(Slide)

The Staff conclusions: Basically in 1976 we were at the point of concluding that the issues were resolved and that a CP could have been issued at the Skagit site except for the geological and seismological questions. The Applicant has in moving to the Hanford site attempted to retain much of the original facility design. It is his conclusion that there are no major design changes required. The Staff concurs in this conclusion.

The Staff concludes that the Skagit/Hanford site conditions will be accommodated in the design and in the operating procedures. As I indicated, the USI resolutions will be implemented. The TMI-related requirements, which I have not discussed here in detail, are in Supplement 2.

We did review the Applicant's commitments. These commitments do include post-CP studies and consideration of design changes. Again, there were no open issues in that SER supplement. The provision of the subsurface data and the May Junction monocline, as the Applicant indicated, he now plans to do that work

after the CP is issued; hence, the Staff concludes that the safety review is complete and we can go forward with a hearing.

We did have a prehearing conference on December 2nd. We have had two Board orders since then. At the present time there is a specific schedule laid out for prehearing activities, discovery, entertaining new contentions and so on, with a tentative date of May 17th for the start of the hearing.

Since then, as the Applicant has indicated this morning, the Applicant has requested the Board to consider a delay in that schedule. The Staff has not yet responded to that motion.

That concludes my overview presentation.

MR. SHEWMON: You said the SSE for this plant would be .35, as I recall. What is the SSE for its neighbors there on the looped project?

MR. MOON: I believe it is .25. Is that correct?

MR. SHEWMON: Thank you.

MR. EBERSOLE: Let me ask a question about the third bullet from the bottom. The classic chronology is that you go through this process and get a CP and you really do not know much about the plant at that time. Then we have anywhere from 5 to 10 years of evolution of

design and detail, and we come to horrible conclusions that lots of things have to be redone.

Is there a procedure in motion here to avoid all that at Skagit by having early-on development of detailed design considerations and in essence saying that at CP time you have really laid to rest a lot of the problems that have normally occurred much later?

MR. MOON: I think as far as pre-CP, I do not see a significant difference here. Since the near-term CP rule does apply to this plant, there are certain holds, and that early after the CP, some extensive analyses have to be done, design changes have to be considered, and in some cases there has to be a hold on hardware procurement, but it is not across the board, it is just in selected areas.

MR. MOELLER: I am trying to understand. You said that the Applicant had asked for a delay in the hearing, and that you will take it under consideration. Now could the Staff refuse to delay and tell the Applicant to move on?

MR. MOON: This is a motion before the hearing board by the Applicant. The other parties, the Staff and the Intervenors, have until, I believe it is February 24th to reply to that. The board then would take all of those replies and make a decision.

MR. MOELLER: Have there been cases in the past where the board has refused to grant a delay?

MR. MOON: I don't know.

MR. MOELLER: I was just trying to understand the proposition.

MR. MOON: The board earlier took the position during the prehearing conference and an order following the prehearing conference that it was their duty to proceed as long as the relevant documents were in front of them. Yes?

MR. WARD: Did you say that the plant is designed for an SSE of .35?

MR. MOON: Yes.

MR. WARD: Maybe it is inappropriate to ask you this, but do you have any idea what the SSE design

for Grand Gulf was?

MR. MOON: I do not, but I think other people here do.

MR. EBERSOLE: I think it is .25, but I am not sure.

MR. WARD: This site demands a .25, I gather.

MR. MOON: I think I cannot answer that question. Perhaps other people here can.

MR. WARD: I mean, the WPPSS plants were designed to .25, you said, I believe.

MR. MOON: I cannot conclude that that would be satisfactory for Scagett Hanford.

MR. SHEWMON: Very near neighbors have been declared at the .25.

MR. WARD: I suppose I am just surprised that a plant with a design that is 50 percent complete, that there are not some potential cost savings for designing to a .25 instead of a .35.

MR. MARK: Perhaps there will be a comment on this, Dave. I believe the .35 was transferred down from Scagett.

MR. WARD: I realize that.

MR. MARK: There could perhaps be cost saving if you had not already spent a lot of money designing for the .35.

MR. STIMAC: We will be addressing this matter under the site characteristics discussion by Mr. Mecca.

MR. MARK: Are there other questions of Mr. Moon?

(No response.)

MR. MARK: If not, then I propose we go on to the more detailed presentation by Mr. Myers.

MR. STIMAC: I would like to introduce Mr. Robert Myers, Vice President, Generation Resources, for the Puget Sound Power and Light. Mr. Myers will be addressing the project schedule and organization and management.

MR. MYERS: Good morning.

I am Robert Myers, Vice President of Puget Sound Power and Light Company, Generation Resources.

At the subcommittee meeting in Richland, they were interested in knowing what generation resources really meant, so I thought maybe I would just indicate that within Puget I have the responsibility for the operation of our existing facilities that generate energy. Primarily we are a hydro utility, and we purchase about two-thirds of the energy that we distribute, so we don't generate a lot.

In addition to that, I have the responsibility for the construction of new resources and for the

monitoring of our participation in resources that are being sponsored by others but in which we have an ownership share. That includes things like the supply system, the Washington Public Power Supply System Plant Number 3 at Satsop of which we have a 5 percent share of, and some coal plants located in Coal Strip, Montana, of which we have a 50 percent share, two operating plants, and a 25 percent share of two additional plants being constructed.

A word about where we are with respect to our requests for suspension of our proceeding and why we are there: We have just asked that we do suspend activities related particularly to moving into the next phase, the environmental and the safety hearings.

We in the northwest, as a result of a bill passed in 1980 called the Pacific Northwest Power Resource Planning and Conservation Act, entered into an era where the determination as to the needs for additional resources in the region and the kinds of resources that should provide those needs would be determined by a regional commission, that being two representatives appointed by the governors of the four states of Washington, Oregon, Idaho, and Montana.

They were given two years to determine what the needs of the region would be over the next 20 years

and how we should meet those needs. In an effort to keep the process moving forward on the Skagit docket, we attempted and gambled to a degree to predict the kind of outcome that we expected to see from this regional council.

We thought they might conclude, as we have, that our ability to predict the future was pretty poor, and efforts to improve our ability to predict the future were likely to result in different futures but not necessarily more accurate ones, and as a result of that one might become more conservative with respect to how you approach planning for the future.

As a result of that, we predicted that there would be a great emphasis on identifying and addressing the uncertainties and then adopting a strategy which was a very conservative way to get the maximum capability to react to a wide range of futures.

In the course of that, we anticipated that Skagit Hanford along with some other resources in the region would be identified as an option that should be maintained for the near term, at least until some of the expectations or predictions were found to be either accurate or inadequate.

The draft plan, which has just been issued and of course we had seen some preliminary work of it, came

out last week. The plan has determined that up through the year 2000 there is no need for any additional thermal resources in the region. It concludes that the maximum rate of growth which anyone could expect to occur in the region is 2.9 percent.

Yes, sir?

MR. SHEWMON: Is that 2.9 in power consumption, or people, or what?

MR. MYERS: That is 2.9 percent of load growth, so it is the actual demand on the system. They have determined in their judgment that 5,000 megawatts of load will be met by conservation measures over this 20-year period.

You should understand that our current load in the region is 15,000 megawatts, and at the end of this 20-year period it is projected to be 27,000 megawatts. So 5,000 represents something like one-third of the energy today, and 18 percent the energy in 20 years. They predict that we will develop in the region over 1,200 megawatts of small hydro.

They predict that we will get 1,000 megawatts of combustion turbines, and we will get the approval to run them under the Fuel Use Act of 1978, and that 500 megawatts of cogeneration will occur.

We do not agree with many of those

assumptions. Puget's resources were taxed severely during the 1970's. During the period of 1974 through 1979, our loads grew at just under 6 percent compounded. We show deficits now going out into the future in each year. The surplus that exists is a regional surplus.

The Act provides for Bonneville Power Administration to sell power to the region. Bonneville is empowered to contract for the output of facilities in the region and resell it. However, they are not authorized to build resources.

So we have sort of a dilemma in sitting back and waiting for the region to provide us with these resources on which we are to rely if nobody builds anything additional, and if somehow 5,000 megawatts of conservation doesn't occur, or 1,200 megawatts of hydro doesn't get build, and so forth.

In any event, there is a great inconsistency at this point between the regional plan and its future as laid out there and the information addressing the need for power that is contained in our environmental report, and as a result of that we concluded that it would be unwise to proceed with the issuance of a final environmental impact statement based on that inconsistency in trying to address it, and thought we

would be better off to wait until the final draft has been issued at the end of April, and to spend our time in the interim in attempting to have some influence on what that final plan says, and that is where we intend to go at this point.

It is a fascinating subject, and we could spend my full allotted time here today talking about some of the problems associated with a procedure whereby eight appointees in two years determine the future of a region which is basically in conflict with the future that might be predicted by those of us who have been trying for a much longer period of time to address the same subject.

Perhaps certainty comes with limited involvement. I don't know.

(Laughter.)

MR. MOELLER: Will all of the utilities have an opportunity, I gather, to comment on this report? Is it out in essence for public comment?

MR. MYERS: Yes, it is. It is issued now, and the public comment period runs through I think March 20th, and everyone is of course welcome to contribute. There is a problem, of course, with a future described in terms that at least inmplies, if not with certainty states, that you this results in not having to spend any

money and not having to endure any environmental tradeoffs that you would see with building power plants, and that we are going to see resources in the two to three cent range. They predict that 95 percent of the hydro can be developed under four cents. We are looking at small hydro. We are not aware of a project that can be done for four cents. We are rebuilding the flume on one of our existing hydro projects, and it is going to come in at six cents, and the dam is there and the generator and the turbine are there.

MR. KERR: It seems to me if I lived in the Pacific northwest, with the beautiful scenery and outdoor recreational possibilities, that I wouldn't want to see it developed either. I would have an idea that if I were on the Commission, I might take the same approach.

MR. MYERS: I think that is true. It tends to ocurr until you go to the ski lift and it is not running today because there is no energy.

MR. KERR: You get more exercise by going up the hill.

(Laughter.)

MR. MYERS: Well, our hills are a little steeper than they are here in the east.

(Laughter.)

MR. MYERS: Climbing up to the top of a hill in the Snoqualmie Pass is good exercise.

MR. KERR: I am sorry to hear that people in the Pacific Northwest are getting soft.

(Laughter.)

MR. MARK: How would you view the possible addition of the MX to that scenery?

MR. KERR: That is part of nuclear power with which I am less familiar.

MR. MYERS: There was another question over there.

MR. SHEWMON: Yes. I don't know that it is particularly germane to public health and safety, but it would seem to me that you would not build these under the same restraint that the WPPSS projects were built with regard to costs or at least with regard to what they had to do and what has now set records, what must be records that no public utility would look at very cheerfully with regard to the cost for a project.

It is your feeling that your management procedure would be enough different and separate from that so that any comparison would be unfounded?

MR. MYERS: Well, I think at the risk of generalizing, I would say yes. For one thing, we would not anticipate having 88 separate public agencies each

with equal control over the project and the ability to participate in the decision-making. As one might imagine, that sometimes might be a little hard to get consensus among 88 decision-makers.

Also, the bidding process, of course, the low bid sort of thing that resulted in having one of each kind of reactor type, one of each architect-engineer, and so forth, I believe the litany has been pursued ad nauseum, but certainly the environment is just essentially so different that --

MR. SHEWMON: Enough.

MR. MYERS: The subjects I intend to cover today are these: the project ownership and structure; our organization and responsibilities, and some discussion of NESCO which is different than in 1977 when we were here before; our QA/QC program; and how we view the transition through construction and to operation that we would go through with a project such as this.

MR. EBERSOLE: Have you studied the Midland problem with respect to QA/QC?

MR. MYERS: We have been involved in an examination of all of the problems that have been brought to light by participation in -- and I have got a slide on that later -- the different activities that have gone on with EEI and others. I think we are aware

of them.

MR. CARBON: A question, please. When you introduced your topic, you mentioned the different responsibilities that you have that involve Montana, hydroelectric plants, and so on. What fraction of your time are you able to devote to the Skagit Hanford project, or to nuclear activity?

MR. MYERS: About 40 percent of my time goes there. The kind of activity tends to vary. During the next three months clearly my emphasis will be on working towards some changes in the regional Act, but I spend quite a bit of time on Skagit. Mr. Stimac indicated I have been associated since 1973 with this project. I was the director of operations planning when we were closer to a construction permit than we are today, we thought.

(Laughter.)

MR. MYERS: We have had a number of roles in this project, and I am also involved in the owners' committee for the Number 3 plant of WPPSS, which takes a considerable amount of time. That is sort of, at least, a synergistic process where direct involvement in looking at the problems the supply system encounters sort of brings it back into the context of Skagit and the application of that experienc into our own efforts.

MR. CARBON: Do you feel that you have enough time to dig into the technical details, the construction, the technical planning and so on to properly oversee the responsibility that you have?

MR. MYERS: I suppose nobody really feels they have enough time for anything. I think, though, you have to -- in a job like this, you have to make the time and see to it that you have a staff of people who are in an open organization, have immediate access to you, and you get involved in those things where you need to either as a result of your staff getting you involved or as a result of the kinds of things that occur through the industry, the experiences that are being addressed, and the different activities within the industry.

We have a strong staff and an experienced staff. Obviously, I do not presume to be up to date on every issue that is currently before our staff, but one does the best he can.

MR. CARBON: Thank you.

MR. EBERSOLE: May I ask a question? In this matter of projecting future power needs, by what process do you think our current estimating techniques are so much better than our past ones? Don't we have the same potential for error except in the reverse direction today as we had five years ago?

MR. MYERS: I think so. That is my concern. I think you have to sort of get personal when you talk about forecasting, because it is almost individualized. I think there is a great fascination with the word "econometrics." The computer has given us the ability to process massive amounts of data in interesting ways and to seven or eight decimal points, but the end result, I think, only time will tell, where it will be as good or better than we have been in the past.

The big concern many of us in the region have had is something that has been characterized a number of ways, but one person says the headlight theory. Whichever direction you tend to be going, you are illuminating the path in the same direction because that is where the headlights are. So if you are in a down sort of economy, where we are now -- The regional council describes it in their draft as a sluggish regional economy. I thought it was interesting.

I haven't heard the present administration describe it in those terms of a recession or a depression, whichever it is, but I think the very low economic activity that is throughout the nation and in the northwest has tended to influence those forecasts down.

I think we run a substantial risk of

underpredicting the needs of the future now as we are accused of doing, and have certainly experienced during the seventies, where it looked like there would be six to eight compounded forever. That is why I say our optimistic attempt to predict what this regional counsel is going to do centered on the hope that they would really just identify that uncertainty and look with a good deal more caution toward how you approach planning, given that you probably cannot improve your ability to forecast the future.

(Slide.)

MR. MYERS: Looking at the ownership now, it was mentioned by Mr. Stimac there are ownership shares. Those are the four ownerships of the NESCO organization. Let me get that covered. Portland General Electric Company was the sponsor of the Pebble Springs Project, which has now been abandoned because of the problems in the state of Oregon. They are also the sponsors and the operators of the Trojan plant, the 1,100 megawatt BWR that is operating now on the Columbia River.

Pacific Power and Light is the utility that operates in five states and has substantial coal resources in terms of generating as well as raw materials. And the Washington Water Power Company is a

company located in Spokane that operates in the states of Washington, Idaho, and Montana.

Our project structure is, as shown on this slide, Puget having the overall responsibility for the design, construction, and operation, NESCO project management, and engineering, construction, direction, and overview. I will get into more about NESCO later. But just suffice it to say at this point that NESCO is not an attempt to create an architect-engineering function within the context that we have created them, bu to provide us with an ownership overview capability that we believe is stronger and more complete than it would be if we were trying to do it on an individual company basis. We will talk more about that later.

Bechtel is the architect-engineer with procurement and construction management responsibility. General Electric is the vendor for the nuclear steam supply system. Westinghouse is the turbine generator supplier, and then other selected consultants are involved in the project.

(Slide.)

MR. MYERS: As the sponsor, we, of course, have overall responsibility for QA, design, procurement, fabrication, construction, preoperational testing, and operation. Some aspects of each of these

responsibilities, of course, are delegated to others and assigned to others, but we have obviously retained the overall responsibility and involvement in all of these.

One of the key items that I believe makes this kind of thing work is an open and accessible organization. We think that is what we have, including our association with NESCO. We have organization charts that show reporting responsibilities and chain of commands, if you will. These are merely ways of defining the hierarchy. They are not constraints to the communications process within the organization.

The people in NESCO feel free to call me directly if they need to and cannot get ahold of the person who they would normally communiate through, and feel the same. We can feed back in the opposite direction. I don't have to go through Mr. Ferguson in order to talk to the people on his staff who are contributing to the Skagit activity.

My boss, Mr. David Knight, Senior Vice President of Operations, likewise is accessible to people in my absence or unavailability. And he likewise feels that anybody below me in the organization is accessible any time he needs a rapid response or wants to get involved in some aspect of the activity.

(Slide.)

MR. MYERS: Now some words about NESCO. Over the past decade or so in the northwest, there have been a number of power plants that have begun to be built as we moved from an era where all of our energy was provided by the federal hydro system, and we began to exceed the capacity of that system, and began to build thermal resources. We began to build these in the region and on a shared time basis because the region, while we had some exceptionally high load growth in terms of percentages, we started from a relatively low base. So it would be pretty unusual for any one of us to need 1,000 megawatts or 500 megawatts at a crack.

So, we ended up in shared projects. We are participants in the Centralia Project, for instance. Portland General Electric has participants in the Trojan Project. The Coal Strip projects are multiple owned, and on and on.

We found ourselves as individual companies, the investor-owned utilities, each attempting to provide an internal staff capable of providing the overview of activities that were going on with respect to the design, construction, and operation of thermal facilities. We go through peaks and valleys of activities. As it was your turn to sponsor a project, you had a relatively large demand for staff; and then

the baton would pass to the nex utility and they would then have a need to staff up and add people with the oversight, and we found ourselves with people who had to find other things to do or had to move on.

This gave us problems in attracting the caliber of people we wanted to get into the organization, people whose career objectives were associated with design or construction activities, not necessarily wanting to move on into operation or other aspects of the utility itself. So the concept of NESCO was adopted.

There were patterns of course established throughout the United States. Other people have formed service companies. Each of them is a little different, as we have found in the process of going to NESCO. We looked at other service companies throughout the U.S., and each of them is unique, but most of them had the same fundamental motivation: that of getting the mechanism to attract and retain highly qualified and motivated people.

They are at this point primarily looking at major project type activities. What I mean by that is, it is a Skagit -- the 2,000 megawatt coal installation that is on the drawing board activity as opposed to the combustion turbines that Puget has been building

internally.

I have a small engineering group that reports to me handling small projects independent of NESCO. It provides us with the advantages shown on this slide, the strong technical interface between us and our principal contractors. The resources of all four of the investor owned utilities are provided in a way that is constructive and effective.

It allows us to recruit and retain very highly qualified people, and it gives us a base on which to draw support for the operating plants when we get them completed, a competent technical staff, and obviously, today, I think everyone is aware that construction never ends on today's projects. You continue to modify, change, and improve things. That seems to be a way of life, and it is a significant and important activity, and we know we are going to be involved in it in the future.

(Slide.)

MR. MYERS: During the course of our subcommittee meeting, there was some interest on the part of the subcommittee on the relative experience of some members of our staff, so this slide is included in your handout there.

It gives the nuclear experience of some of the

people here today and some of the other people in our organization. There are a variety of backgrounds that come together here, my own background being getting out of the University of Washington and going to work in the operation of the nuclear weapons production facilities for eight years, ending up as operations manager of one of the K reactors here, then going to C-KOR, the experimental fast breeder reactor that operated for a period of time there, then to San Jose, working on the development of the proposal for the Clinch River project, and then up to General Electric.

Others, like Mr. Newkirk, senior staff engineer, came to us out of Commonwealth Edison. He just has returned from a two-year period on loan to INPO as part of their evaluation team, two invaluable years of experience. I don't know how many utilities have taken advantage of the opportunities, not all of them to get the Staff back there and get them involved in this activity, but in my view that has got to be one of the better investments that we have made.

Mr. Newkirk brought back invaluable insights as to the things he observed in the activities during that period. You get into a lot of plants in the construction and operating phase and see a lot of ways to do things, and as well a lot of ways not to do

things, invaluable experience.

Others, to go through the list, Mr. Hettinger is a man who has been in quality assurance for many, many years, starting over in the Hanford area. He is in fuels fabrication. Mr. Ferguson, the president of NESCO, having come to Puget from United Nuclear, where he operated the facilities in New Haven, then moved to Mondale, producing Admiral Rickover's reactor for the submarines.

And the list goes on, a good cross section of people from various backgrounds, various disciplines, bringing together a team with many different approaches to problems, and uncommon experiences which I think all contribute to having a healthy respect for the activity you are involved in and a healthy skepticism that is so necessary, I think, as you go through the projects.

(Slide.)

MR. MYERS: In response to a question I said that we would get back to, we are very attuned and our attention is focused not only because of our own interest, but because of the requirements of others, on much of the activity that has gone on here recently. QA has certainly come in for a great deal of attention and a great deal of experience has come to light here in recent times. We are participating in activities like

the EEI QA Committee where Mr. Hettinger, our manager of QA, is involved. We get the proceedings from all of the activities like the ANS Conference looking at the results of QA experience in the industry.

We have paraphrased here the primary lessons learned as a result of a lot of the recent industry experience. You get into specific problems, but I think at the root of those problems, at least in a general way, we think these two items are keys to identification and resolution of the kinds of problems that have been plaguing the industry recently.

Clearly, the initial identification of the need for self-examination and independent design review has had an impact on all of us as we look at the way we are going to approach projects like Skagit Hanford. Failure of management teams to provide adequate management controls, that is easy to say, I suppose, as a root cause. Curing it is a challenge. But at least in recognizing that that is a basic problem you have a start on a cure.

MR. BENDER: I am still conscious of the fact that you have Bechtel doing the engineering of this. It seems different from the one that is doing the Grand Gulf installation. I don't know what their experience is, but obviously they have experienced people in a number of different groups. If you take advantage of the experience at Grand Gulf, it seems to me there ought to be some kind of interfacial relation between the team that did Grand Gulf and the one who is doing this one. Does such an interfacial relationship exist?

MR. MYERS: I think first of all you have to understand where we are in this activity. Any discussion on the Bechtel team today is irrelevant, because there really isn't a Bechtel team of any magnitude. The design is about 55 percent complete. When we remove the project from Skagit in western Washington over to the eastern Washington site, Skagit Hanford, the design work that has been done since then has been the design associated with the new conditions at Skagit Hanford site. There is almost no ongoing design activity at the present time.

Our efforts have been focused on the licensing activity. There has only been activity in support of that. Bechtel has in place mechanisms where the various organizations within that organization have regular

meetings with the experience of the different offices. They are the San Francisco offices at Gaithersburg, where we have interface to share experiences, and as organizations grow and dwindle we move people from one of those projects to another.

I think any specific comment, we have a member of the Bechtel organization here if you would like to hear abut the way they get that information flow within Bechtel.

But with respect to our specific design team, at the time we get a construction permit and reactivate a design to complete the project, I would certainly think we would have the ability to draw on individuals out of that Grand Gulf particular experience because of the fact that Grand Gulf will be completed by then.

MR. BENDER: I certainly recognize you are not going to have a heavy design effort at the time when the project can be pursued. You are in a state of limbo, and I believe that is understandable. I guess I am not persuaded that there is an automatic mechanism for taking advantage of the lessons of one project and translating them to another.

It does seem to me that it is really the owner's responsibility to make sure that its contractors take those actions. I would anticipate that there would

be some deliberate effort on your part to try to establish that some people who are familiar with what happened at Grand Gulf would in fact be part of this team. If you are going to restaff it, you may as well restaff it in the right way.

MR. MYERS: Indeed, I agree with you, and I would certainly agree that there is no such thing as an automatic anywhere in this business. If you start relying on the automatic activities, that gets you into the kind of problems we are highlighting on this slide.

Clearly -- and we get into this a little more in the QA -- but the owners quality assurance program has got to work. It has got to be there. I think the key to that is really whether the owner has a quality assurance program that is there because he believes it will make him money and it will get him the quality project product that will over time be a moneymaker or whether or not he is responding to the slings and arrows of the regulatory agencies in providing those activities that he has to provide.

If you approach quality assurance from the standpoint that it is something that is important to you because it is going to make you money, and that your response to problems is immediate but constructive, and you avoid the temptation to shoot all the messengers who

are bringing you the bad news, I think you have a good chance of getting a QA program that will work.

On the other hand, if one is not careful, you can lapse into the kind of behavior that contributes to the problem as opposed to contributing to the solution. We have developed a set of QA objectives which we think in an abbreviated form at least where we think a program has to be based. You have to know what is going on. You have to have eyes and ears out there. You cannot rely on your contractors to be the only source of information on how well things are going, how well the project is providing you what you want or whatever.

You have to evaluate and understand and be convinced that the contractor is capable of doing the work you are going to assign him. I don't think you can overemphasize this. Many of our problems have come, in the Northwest, have come particularly as a result of the problem with having to go with low bidders and specifications which were not unique requirements with respect to recent experience or comparable activities.

As I mentioned, the experience we had at SEFOR, we had the beginnings of quality assurance. It was just called quality assurance in those days. But even in those days everyone had to radiograph all the welds in the primary system and we had a program to do

that. The quality assurance, everything worked fine. All the welds got radiographed, all the records were complete and so forth.

The only difficulty we ran into was that the people who were doing the radiographs really didn't understand what it was the radiographs were intended to do. We found after the fact, and in fact after the piping was already heat-traced and indicated that the penetrameters used in doing the radiographs were incorrect. So we had no way to determine the proper density of the film, and that gave us the opportunity to go in and remove the insulation and a portion of the heat tracing and reradiograph all the welds.

The fact that we didn't find any problems is kind of insignificant. We had a substantial cost, and the cost really was the result of people not understanding what it was you were trying to provide with the requirement of radiographs.

Our objective was not to show that we had radiographs, it was to show that we had adequate welds in the piping. I think that is where we get to with the do-it-right-the-first-time sort of thing.

People have to understand that quality does not come from the quality assurance people. They are merely out there verifying. Quality comes from the

people doing the work. Unless your work force understands that you are relying on them for the quality and they also understand that the quality assurance program is a way to ensure that you are getting a reliable and cost-effective project, then you are likely to have problems.

We believe that proper attention to the attitudes and a proper attitude on the part of management can go a long ways towards contributing to a good experience with respect to quality of construction and some of the problems that have been reported recently.

I believe the last bullet is equally important. The problems have to be kept in the open. As I said earlier, your response to them has to be constructive, and rapid, and people must know that what you are after is a quality product and not be scapegoats.

MR. EBERSOLE: Did you say you do design QA and design evaluation? Do you have people who do this? Do you have people who are doing design evaluation in your organization?

MR. MYERS: Again, currently we have very little activity going on, but yes, we have been involved in audits of design, and we will be looking at the INPO criteria as we begin to go forward with the project and

get back into the project to examine whether or not the documentation is actually there and looking at --

(Pause.)

MR. EBERSOLE: Let me give you a case in point. Would you, for example, have a group look intensively at the GE scram system and provide you with views as to its overall conceptual adequacy and reliability?

MR. MYERS: The scram system on the BWR-6?

MR. EBERSOLE: Yes.

MR. MYERS: No.

MR. EBERSOLE: Okay.

MR. MYERS: I do not presume to develop that kind of capability within my organization.

MR. EBERSOLE: All right.

MR. BENDER: Excuse me. I don't think we should let that point go just like that. Who would do that? Are you trusting GE?

MR. MYERS: Well, I don't think that -- certainly, there is some trust associated with GE, but the involvement of the Owners Groups, the involvement of the NRC in its basic review of the reactor design itself, our involvement with the industry experience, the licensee event reports and other things, for instance the difficulty with the scram systems, help

you to understand what is going on.

But in terms of going in and doing on our part an evaluation of that basic design, we are not involved in that activity.

MR. BENDER: How much capability do you have to challenge the engineering of a nuclear supply vendor's proposals?

(Pause.)

MR. MYERS: Could you tell me what you mean by "proposals"?

MR. BENDER: I think the scram system is not a bad example, but let's take some other things.

MR. SHEWMON: We could pick another system at random, the stainless-steel piping and stress corrosion cracking that has shown up in a half-dozen plants in the last six months in major pressure boundaries.

MR. BENDER: Or the pressure suppression steam that goes with the .35 g. seismic requirements. How do those things get addressed?

MR. MYERS: Well, we use a team effort involving ourselves, the architect-engineer, and consultants from time to time, depending upon if you are getting into stress corrosion cracking, we might not have a materials expert on that, but we would be aware of the problem and get others involved.

We do have some people here who could perhaps address the specifics of how we interface with our vendors and consultants on those kinds of activities if you want to get into them into detail.

MR. BENDER: Well, I believe it is inappropriate to start reviewing the design at this stage. I think we are more interested in how the capabilities are established within your management concept. I guess I find the responses so far a little vague. I think they are probably better than I understand them, but I think before the Staff gets done with this review, it seems to me they ought to be in a position to know that there is enough of that capability within the licensee's organization, so that it certainly has the capability to --

(At this point in the proceedings, Mr. Myers became ill.)

MR. SHEWMON: I suspect we will have a ten-minute break at this point.

(Brief recess.)

MR. RAY: The meeting will resume. We are going to assume that Mr. Myers has certainly conclusively covered the subject matter that was assigned to him, and I have an understanding with Mr. Stimac that if there is anything left unsaid that Mr.

Myers would like to communicate to us or respond to questions that he was wrestling with at the moment, that we would be sympathetic to the idea that he do that in writing.

Do you have any objection?

MR. MARK: That is fine. And there is also of course the fact that there is a large group of other people here who could probably take on some of the questions.

The rescue team is on its way over, and there may be a few people involved that will not be back for a while.

MR. GREBEL: Our next speaker is Mr. Jim Mecca, Manager of Safety Systems at NESCO. Mr. Mecca will be addressing site characteristics.

MR. MECCA: Good morning. I am Jim Mecca, Manager of Safety for NESCO. I intend to give you a short overview on the general site characteristics on our new location at the Hanford Reservation.

As you have heard from Mr. Stimac, the new site is now east of the Cascade Mountains versus the west, in an entirely different atmosphere and environment than we once were in. In order to evaluate our plant design, an independent design assessment relative to the site characteristics was made.

What we found was that our data banks that we arrived at were very consistent with those data banks of the Supply System and the FFTF. Many of our design criteria, as indicated by Mr. Moon, such as the tornado criteria of the plant were invoked at Skagit.

(Slide)

The characteristics that I am going to touch on are, of course, the geography, demography, the nearby facilities as they exist not, the meteorology of the area, how they affect us, the hydrology of the site, and finally I will dwell probably a little bit longer on the geology and the seismology.

(Slide)

Here is a three-dimensional rendering of the Skagit site in the middle of the Hanford reservation. We may just take a moment out here to point out some of the features. We do have the 400 area, which is the FFTF site. We do have the supply system sites. The black dot is the sketched Hanford site. We have the separation areas or the reprocessing areas, known as the 200 areas. And along the rivers, the reactors, the N reactor being approximately right here behind Gable Mountain.

Some of the features you will hear me talking about and reiterate again in terms of geology are the

Rattlesnake Hills of Canum and Yakima Ridges, in this vicinity. The Saddle Mountains, the White Bluffs area.

Back in this area is Richland, and North Richland is the closest point to the population centers.

Very quickly, going into the geography and demography of the site, it is approximately 1,200 acres, 640 acres of which is going to be owned, 560 acres which will be leased.

The site does have a 1-mile radius exclusion boundary, and we have chosen a 4-mile LPZ. I might point out that the roads in the area and on the reservation are all DOE-controlled roads within the low-pouplation zone there is a barricade here where these roads come together. That is known as the Y barricade. It is the only occupied area in the LPZ. It is a guarded station.

There are no public facilities within the LPZ. There is a railroad. It is a DOE-controlled railroad, approximately 150 miles in length. Within the 10-mile radius of that site there are approximately right now 360 people. The nearest resident is on the other side of the Yakima River, north of the site about 7-1/2 miles away, and generally is called the Horn Rapids area.

We would expect that if a population did

develop, it would develop in this area (indicating), and along to the southeast along the Columbia River and the farming areas.

About the time of the projected fuel load of Skagit in year 1990, we would expect that this area will build up to about 520 residents. Within the 50-mile radius we expect to see a population of around 340,000. According to all of the criteria, it is still a very, very low population density.

The facilities I pointed out to you before, including over here the 300 areas, which is the laboratory area run by Battelle, and they employ or are projected to employ -- this includes the operation of supply systems 1, 2, and 4 -- a total of about 6,200 workers in the year 1990.

I should point out that these facilities are outside of the LPZ, and these workers would be impacted in the event of an occurrence at any of the units by a coordinated emergency plan. So we do not anticipate a problem with the trained employees.

(Slide)

The nearby facilities, some of which I have already indicated, are again shown on this two-dimensional with the 5-mile circle on it. We see that the FFTF and the supply system unit 2 are within

the 5-mile radius. They are approximately 4.8 miles distant from our site.

The potential impact for any hazardous materials stored at those facilities has been reviewed, and we find no impact on the Skagit Hanford site. This includes storage of materials at FFTF.

To the east of the Y barricade, which I pointed out to you here directly to the east, is an old radioactive waste burial ground which is now inactive. The only potential problem with that burial ground probably could be groundwater. Generally speaking, in that location the groundwater flows to the Columbia River. Again, we do not see any impact.

The proposed hazardous waste site is a nonradioactive waste site. At the moment things like lead sludge, pesticides, some of the nonradioactive but considered toxic materials are shipped to Arlington, Oregon from the State of Washington.

This site is proposed and is simply not built yet until Arlington, Oregon, decides not to take the material from the State of Washington. It would be at that time that this site would be considered for use. We would expect that we will monitor that site, monitor the development between the States of Oregon and Washington and report back on the impact of that

development in the FSAR.

The major railroads and roads, the yellow line here is the railroad, its closest approach to the site is 3-1/2 miles. We have looked at everything transported to the FFTF supply system and into the areas of the N reactor area, and we see no impact again from that railroad.

The roads, we have Route 4 coming in from North Richland through the Y barricade. It continues on past the 200 areas to the N reactor. There is a route, a DOA route, which is called 10. It changes numbers at the Y barricade and becomes 2 and wheels over. The closest road approach here then is Route 4.

Again, we have evaluated what that road might carry or transport, and once more in the case of the hazardous materials, whether it is chlorine, ammonia or explosive materials, we find no impact on the site.

There is one major artery that comes within the 5-mile boundary. It is State Route 240. It is something like 4-1/2 miles away from the site. We do not see any impact from that transportation review.

Relative to the Columbia River, most all commercial traffic stops down here at the Port of Becket in North Richland. There are no lops way upstream here at the Crease Rapids Dam, so the river and the reach is

primarily used for recreation.

So again, the river is about 7-1/2 to 8 miles away, outside the 5-mile radius. From the point of view of the nearby facility or transportation route, it poses no hazard to the site.

Air traffic, the nearest airport is the airports at Richland, 13-1/2 miles away. It does not accommodate commercial traffic except for some taxi service once in a while. The principal airport of concern is further down here for the Tri Cities at Pasco 41 miles away. The air routes and the airports themselves have been analyzed according to the proper standard review plans, and we have seen no impact on the site.

There are no pipelines or storage facilities within 5 miles of the site either. Hence there are no impacts from the pipelines. The closest pipeline is the gas pipeline owned by I think it is El Paso Gas, and it is some 17 miles away, to give you an indication.

These bullets are the conclusions that the Staff has come to. We agree with the Staff. And as a matter of fact, we have done our assessment according to the Standard Review Plan and the appropriate 10 CFR 50 Appendix A General Design Criteria.

(Slide)

Moving quickly to meteorology, once again I put up that three-dimensional slide. The area of the Pasco Basin, the Hanford reservation is generally dry. The air patterns are indeed especially of effluents are dominated by the topographical relief area. Rattlesnake Hills is about 3,000 feet high. Saddle Mountain is about 4,000 feet high.

The area generally around Skagit Hanford and the supply system for almost a 10-mile area is rather flat. So it was, upon reviewing the supply system data with the Staff, it was decided to use Supply System data from the Supply System unit 2 in the tower that sits approximately 4-1/2 miles from the site. There are no manmade obstructions. So we feel confident that that data was useful.

(Slide)

The hydrology of the area: We have looked at the Standard Review Plans and the appropriate 10 CFR 50 through 100 guidance. The dominant flood, probable maximum flood, is on the Columbia River. It is an instantaneous breach of the Grand Coulee Dam. We find that that still gives us 80 feet before you can reach the top of the base mat. The local probable maximum flood in the local drainage basin for Skagit is an extremely conservative assessment, and we find that that

value gives us at least 1 foot of freedboard before we come to the top of the base mat.

Both of these floods of course are with coincident wind effects, which are extremely severe, up around 60 miles per hour.

The low water in the Columbia River is regulated by the Creased Rapid Dam. The mandated low water flow in this reach is approximately 36,000 cubic feet per second. By contrast to that, the two power plants will utilize about 93 cubic feet per second.

In any event, because of the ultimate heat sink capacity, 30 days of water on the site, we see no problem with low-water effects for the sake of safe shutdown. Groundwater in the area comes to within about 125 feet of the top of the base mat.

The lowest structure that will be on the site are the ultimate heat sinks. They still are something like 50 or 60 feet above the water table. The water table, I might add, will not be used for either wells or any other supplies. So we find the water table will not impact any construction considerations that we might have in mind.

(Slide)

Before I go into geology and seismology and the summary of it, I might take here a minute to

emphasize that the Hanford reservation has been studied quite strenuously over the last 30 to 40 years. Most recently it has been our experience to be involved with DOE, Rockwell, in the supply system in sort of a cooperative effort.

In this regard, we have exchanged an awful lot of information with the people on the reservation. We not only exchange it, but institute at times peer review of it. Much of the information therefore has been utilized and incorporated into both the supply system docket 2 and our own.

Although we have had different questions at different times, it seems the answers generally are coming out very consistently the same.

Now, the Skagit site, as located on the reservation and outlined here in gold, the reservation of the Skagit site, is located to orientate you in terms of terminology in a bigger area known as the Pasco Basin, the Pasco Basin being a physiographic and structural subdivision of yet a bigger entity, which is called the Columbia Plateau.

The site, as I indicated, is located approximatrely in the middle of the reservation. Dominating around the site are what we call basalt rock outcrops on Tanam Ridge, Yakima Ridge, the Saddle

Mountains, and back down here are another set of hills known as the Wallula Hills. We do have stratographic sequences along the river known as the White Bluffs.

You will hear me talk about Gable Mountain, which is a rock outcrop about, oh, some 9 to 10 kilometers away from Skagit. Skagit sits on approximately 700 feet of sediments underlain by a thick sequence of basalts. In a flat plateau area, the reservation, those basalts are generally undeformed and relatively flat laying. Most of the ridges can be dated to have deformed or uplifted something like 10 to 5 million years ago.

The reservation in the surrounding areas for years has been instrumented. It is an area, as we see it, of low seismic relief, low seismic earthquakes, very much diffuse and scattered. We cannot at the moment or we do not see any association with the earthquakes that are being monitored with any of the major structures in the area.

(Slide)

The closest structures resulting in the deformation that have taken place within the 10 to 5 million year time frame are exhibited on the three-dimensional drawing. Of concern to Skagit, and this is a 5-mile radius, are indeed the Gable Mountain

structure, the Rattlesnake Hills structure, and then finally two structures which are not expressed on the three-dimensional because they are subsurface. One is the southeast anticline and the other is one that has been mentioned earlier, the May Junction monocline.

(Slide)

Dealing with these structures there is faulting on the structures. On Gable Mountain there is some faulting and glacial material which overlays a fault with very small indications of movement on it. It is a very tough fault to date. It is fault that possibly could have been new to floods in the past glacial period or the displacement could have been due to that hydraulic rebound or whatever. In any event, it is a very difficult fault to date. Therefore, the Staff considers the fault in Gable Mountain to be a capable fault.

Similarly, there is a fault with very small displacement on the southeast anticline. The Supply System did extensive work on this fault with a series of core holes, very closely spaced, with sediments laying over those faults in excess of 700,000 years old. So the faulting on the southeast anticline has been judged by the Staff to be not capable.

Along this long trend of the

Rattlesnake-Wallula alignment as we call it, which goes into Oregon, there are faults which also are difficult to date and appear capable. The closest one to the site comes within 25 miles. So the Rattlesnake-Wallalu alignment is a zone of hills, a zone of faults or structures. It also has been considered capable.

May Junction now, compared to these other features, is a very small feature. It is approximately 2-1/2 miles in length. It also is a subsurface feature. Therefore, you cannot see it on the surface. The Staff asked us to investigate the May Junction monocline for indications of maybe fault control on the monocline.

We have done extensive gravity work, geophysics work over this monocline. We chose three holes, rotary bore holes to drill across this monocline on the top middle toe of the monocline. We could not find any evidence of fault. At this time we have agreed with the Staff that maybe additional core borings ought to be put down across that monocline to confirm our conclusions.

That is prior to doing any major construction work.

(Slide.)

We have looked at the structures and tried to determine what these structures mean to the Skagit/Hanford site, and we have addressed several earthquake sources which we feel are also very much in line and associated with the same sources that were specified in Supply System unit 2.

We've looked at magnitude 4, nine kilometers, we've looked at a 6.5 magnitude earthquake on the Rattlesnake-Wallula alignment. The approach of the Skagit site is 15 kilometers. We've looked at a magnitude 5 earthquake, 10.2 kilometers on Gable Mountain, and finally, we've looked at the largest historical earthquake in the area, which is the Milton Freedwater 1936 earthquake, magnitude 6.1, which I think now also has been looked at again. It's probably more like a 5.8 from 0 to 25 kilometers from the site.

The magnitude 6.5 on Rattlesnake and the magnitude 5 on Gable Mountain, it should be pointed out, are not our magnitude assessments of the earthquake. Those magnitudes were arrived at by Dr. Bert Slemons, a consultant to the NRC staff, after he considered the fault length, the geometry of the faults, the slip rates

and things like reccurrence intervals. These are the same magnitudes that the Supply System used.

Taking all of that and looking at the ground motion that we might get at the Skagit/Hanford site, we find that the ruling, critical event is the 6.5 magnitude earthquake at 15 kilometers. What we do then is we try to estimate what the probable maximum peak ground motion at the site might be. We use the same attenuation relationships, as used by the Supply System; we average those and generated a spec per NUREG-0098.

If one were to develop an SSE for this particular site just on the basis of the attenuation calculations, we found that we were looking at the lower spectrum anchored to about .316g. May I remind you that the design of Skagit that we have carried to the reservation is a Reg Guide 1.60 spectrum anchored to .15g which is at the top of the curve. Thus, it is our position that the plant has, indeed, margin at this location.

Our conclusions relative to the geology are, then, that the site -- our investigation of the site meets the criteria of 10 CFR 100, Appendix A. We do believe we are in a region of low seismic energy release, low stress, that the deformation that we are looking at on most of these structures and rock outcrops

which have had the sediments eroded from them have occurred long ago, from one to five million years ago. The May Junction monocline as we see it at the moment is just simply a simple monoclinal fold, not fault controlled.

We do acknowledge that Gable Mountain and Rattlesnake-Wallula alignment should be considered capable, but we also are addressing those two elements, the two features, and the Skagit design exceeds the effects of the credible event.

And that, unless we have questions, sort of is a summary or a synopsis of the site characteristics.

MR. MARK: Are there any questions for Mr. Mecca?

(No response.)

If not, --

GREBEL: Terry Grebel. We would like to make a point from Mr. Myers' discussion from the transition to operation. He will be presenting essentially the same material that was presented at the subcommittee, and that information will be available in the transcripts. So we will be pleased to respond if there are any questions.

In addition to that, we are prepared at this time to have Mr. Warren Ferguson, the President of

Northwest Nuclear Services, provide more information on our design review capability in line with the questions Mr. Myers was attempting to address.

MR. MARK: Those were Mr. Bender's questions.

MR. FERGUSON: Yes.

MR. GREBEL: I believe that's correct.

MR. MARK: I do believe we would like a few wors on those points if you have them comfortably available. And the matter of the transition -- I believe I can speak for the other subcommittee members. It really looked as though you had given adequate thought for this period to those problems.

MR. GREBEL: We would like, then, at this time to introduce Mr. Warren Ferguson.

MR. FERGUSON: Mr. Chairman, gentlemen, my name is Warren Ferguson. I am President of Northwest Services Energy Company, I appear before you as the responsible officer in Puget Sound Power & Light at the ACRS presentations in 1977 and 1978, and I can assist you in gaining a perspective on the extent of Puget Power's overview in the design process because I personally was involved in bringing into the company a strong cadre of experienced nuclear systems design people.

I reviewed with you at that time my pleasure

at being able to draw on some exceptional people, and I reviewed about 40 people with you that had something like 375 man years of experience. And we did, from the very beginning of the project, establish a policy in the company of doing a very heavy amount of overview and direction, so to speak, of the architect engineer.

We placed in the company, as I said, senior people in the discipline of civil, structural, mechanical, in the areas of heat transfer, piping, in the areas of electrical and instrumentation and control. I had considerable experience in this area. I have about 32 years of experience in reactor design, operation, and reactor manufacturing, fuel manufacturing.

In the period of years in which the some 60 percent of the design of the Skagit project evolved, we held not only regular meetings with Bechtel at least monthly and often more frequently, but we had task force meetings with General Electric, with vendors that were involved in the principal systems that we were looking at. For example, we did look at the emergency core cooling system, we did look at fuel integrity, we looked at nuclear systems piping transitions, stress corrosion problems, assigned our key staff people to work on these key task forces and to be active in the industry task forces that evolved.

We looked at basic design criteria. We met with Bechtel at the start of the design process and went ahead with them on what were their basic design assumptions; were they just borrowing them from another plant or were they looking specifically at the applications we were looking at?

We looked at the specifications, we looked at the drawings, we looked at a detailed fit up on our model. This project has an extensive amount of early design review. We have completely modeled the system down to a one-half inch pipe; one of the largest models in existence today, and we have performed a detailed design review.

We, Puget Power, and now NESCO, are in a position to maintain that type of design overview. We have retained that capability in the Northeast Services Company to pursue that intense design review as the project moves ahead.

I would be glad to field any questions on that.

MR. EBERSOLE: May I ask a question? I guess I will go back to my original question that started this. When you do this route type system design review, do you go back to the fundamental logic of design evolution -- I'll take a case in point, the BWR hydraulic scram system -- and look at it in a very

fundamental context and ask yourself a question such as this: why do I have a very -- apparently very good-looking system in connection with independence of the individual rods up to the point were I begin to look at a common dump volume. When I look at that, why is it that I have to take a common dump volume in the first place as an element of the design? Second, why do I close it prior to complete seating of the rods on a complete scram maneuver?

MR. FERGUSON: I cannot comment specifically on that, but that very illustration is in my mind as I look at a system design. I look not only at the components and their action, but the total envelope of the system. The total restraint that that system sees; what it must do and what retraint it has.

Another thing that may help, Dennis Hacking, our Project Engineer, is prepared in his presentation to review with you the detailed type of overcheck we make on systems like that.

MR. EBERSOLE: I will just wait for that.

MR. RAY: Mr. Ferguson, from what you have said -- and this question may reveal my lack of understanding of all of your organization because I was out of the room; if so, forgive me. But from what you have said, I gather that during the design of this

facility, your organization was the in-house engineering staff of Puget -- if I might give it a role.

MR. FERGUSON: That's correct.

MR. RAY: And I presume it will continue that way through the completion of the plant. What will be the relation, or what will be the engineering expertise available to Puget during operation of the plant to work out retrofitting and follow the necessary modifications during the life of the plant?

MR. FERGUSON: I would be glad to discuss that. As I nodded my head to your outline, that is exactly what has happened. We drew in -- I personally drew in about 60 professionals in the nuclear industry into the Puget program. About 40 of those have come over to NESCO and remain available to the program.

Those people in NESCO are organized, in the particular case of the Skagit project, solely to do that activity. The nuclear project manager reports directly to me. It is not a diluted activity.

As the project nears its operating stage and particularly when we go into pre-operational testing, a number of the people in NESCO will phase into the Puget plan. The concept of NESCO has allowed us to attract and hold the strength in our technical people, the experience that we have, because of the breadth of the

NESCO program, and those people have understood that they will have opportunity as the plant progresses to move over into the permanent Puget operating force.

So, Mr. Myers plans, with my assistance, to draw on that talent within NESCO for the permanent Puget support force, and then in addition, NESCO is the permanent backup, technical and construction, force available to those four owners of the Skagit project. So there will be a transition into the Puget team. And also, we will have reserves, because of the size of our NESCO program, that will be supporting plants like Trojan and some contract work for the Washington Public Power Supply System.

MR. RAY: Thank you.

MR. GREBEL: Are there any further questions of Mr. Ferguson at this time?

(No response.)

If not, if it is convenient at this time, we would like to address an earlier question on occupational dose goals before introducing Mr. Hacking. At this time, I would like to introduce Mr. Robert Newkirk, Senior Project Engineer.

MR. NEWKIRK: My name is Bob Newkirk from Puget Power. As we indicated at the subcommittee meeting, we have not formalized any occupational

exposure goals and targets at this time. We did do some preliminary estimates several years ago. We have, since the subcommittee meeting, reviewed the paper which Dr. Moeller refers to. This paper was prepared by General Electric specifically to estimate the expected exposure for the BWR-6 design. The paper does this by estimating the specific improvements in the design.

Another is the seal purge system on the reactor recirc pump. It also refers to the recent experience of like 700 man rem. A significant part of this exposure is due to such things as feedwater sparger repairs and cracked pipe repairs.

I should say that if this paper is an accurate assessment of the BWR-6 improvements, then certainly 370 man rems ought to be a good goal for us, because the Skagit design will include all of these design features.

In addition, we have had extensive design model reviews. We are tracking the test programs such as the EPRI/GE effort to replace the stol light rollers on the control rods, and we also will be monitoring the Grand Gulf experience.

MR. MOELLER: Have you raised any questions or had any discussions, for example, directly with GE and expressed any interest in maintaining the occupational doses as low as reasonably achievable?

In other words, you have reviewed the paper now, but in your oversight, say, of the plant and as you work with GE and design it, are occupational dose rates coming up as a subject for discussion?

MR. NEWKIRK: Yes. One example that comes to mind is the reactor water cleanup pumps. Recognizing that that was a large source of exposure of repeated failures, we have requested additional quotations from General Electric aimed at improving the design of those pumps.

MR. MOELLER: Okay, thank you.

MR. SHEWMON: There are other sorts of things that you could have from GE which involve de-aeration capability before startup, and while we're here, what kinds of pipings are you committee to, or is that still in arrears, or has it been sitting out in somebody's yard for the last three years?

MR. NEWKIRK: The piping we have has been delivered. It's located in our warehouse. It is not in an outside area. It is 304 stainless. We recognize that's an issue we have to address when we activate the design effort. I strongly suspect we'll never use that piping.

MR. SHEWMON: What about the de-aeration capability?

MR. NEWKIRK: We did look at the studies GE did. As I recall, we did not make a firm decision to adopt the system which they were proposing at the time. But we are aware of the potential benefits of oxygen control, particularly in the feedwater system. And I think it is still an item we have to look at when we resume our design efforts.

MR. SHEWMON: Thank you.

MR. GREBEL: If there are no further questions, we would like to introduce Mr. Dennis Hacking, Project Engineer for the Nuclear Services Company.

(Slide.)

MR. HACKING: My name is Dennis Hacking, I am the Project Engineer for the Skagit/Hanford Nuclear Project. I'm employed by Northwest Energy Services Company. I'd like to discuss a few of the design considerations we've taken into account about the time we made the decision to move the site as well as the design considerations we will use to go into future events.

A few comments have been made here during the meeting on some questions regarding our control rod design system, and I will make a few comments with respect to that as I go through my presentation, as well

as further comments with regard to the reactor recirc piping, as was discussed by Mr. Newkirk just a moment ago.

I would like, at this point, to probably step backwards in time just a little bit and maybe re-emphasize that our plant has reached a mature design. At the time we made the decision to go the Hanford reservation our design was almost 65 percent complete. We recognized at the time that we were going to make this design move, that we were going to go backwards in design to some degree.

We sat down and took a look at all of the plant itself. Our intent was to move this plant intact as much as possible and preserve the design that we had already completed and change only those portions of the plant necessary in order to accommodate the new site.

Therefore, when we took a look at the site -- any of you who have visited one or both of our sites will recognize there's an extreme difference in the two sites.

It's a rainy climate. As we go across the Cascade Mountains to the desert environment of the Hanford Reservation we find ourselves in a flat, rolling area and essentially in a desert environment. So we had to go through and identify all of the criteria that had

any impact due to the site change itself.

We broke this criteria up into three catgories. First, the criteria that would remain essentially the same or, by conscious decisions on our part, they would remain identical from one site to the other. The other category was those areas where possibly the Skagit area required more conservative design than the Hanford Reservation. In that case, we opted to retain the design wherever possible allowing some conservatism in the plant and the option of making changes in the future if we desire to do that.

An example of this might possibly be that as we went from the Skagit River Valley to the Hanford Reservation, our snow loading criteria for the structures themselves was greater at the original site. We retained that capability in the structures. We did not redesign them.

Our tornado requirements and wind velocities for the tornado design was greater at the Skagit site than it was at the Hanford Reservation. We retained that same design so our structures still have that conservatism within them.

The third category was the area where design changes would have to occur because of the site changes themselves. That is what I would like to address on my

next slide.

(Slide.)

Some of these areas are rather obvious, the first of which is meteorology. Obviously, as I mentioned before, anyone who has been to the site clearly recognizes that we have different requirements at different sites, one being the humid climate, the other being the desert climate.

As characterized in Mr. Mecca's presentation, our sites were very different. At the original site, it was located on a hard rock foundation. At the new site on the Hanford Reservation we will be located under different soil conditions; therefore, we will have to have changes in the design with respect to that.

Obviously, we cannot obtain our well water from the same supply; therefore, we had to change some design with respect to that. Our plant liquid discharge likewise will have to be modified according to the new site.

A subject which I'll discuss in a little more detail as we go on is the electrical transmission interface. Simply because we are at a different place in the state, we interface with the transmission grid in a different manner.

(Slide.)

As we took a look at these design criteria, then we took a look at the plant design itself and went through and evaluated all of the designs and determined which features would physically change within the plant. I have shown on this slide the more major changes which did occur.

The first change is the cooling towers. The cooling towers at the original site for the main condenser were natural draft cooling towers. As we went into the desert climate, we had to change our design to the mechanical draft cooling towers, similar to those that are being utilized by the Supply System. So that was a significant change in that area.

Because of the warmer temperatures, we had to make changes in our HVAC system, our heat, ventilating and air conditining systems. We had to accommodate the warmer temperatures in the summer months.

Another major design feature was a change of the foundation itself. I mentioned earlier that we were located on a hard rock foundation at the Skagit site. As we moved to the Hanford Reservation, we are located on a soil site. Therefore, our design has been modified in that we now have a base mat underneath the containment fuel and aux building. This base mat will be a 20-foot, fixed slab of concrete.

Our ultimate heat sink's dimensions have been modified as well, partly due to the change in meteorology and partly due to reshaping the building to accommodate the newer site.

The raw water supply -- originally, we were taking water out of the aquifer adjacent to the Skagit River. This was utilizing rain wells to draw water out of the aquifer. At Hanford, we will be taking the water out of the Columbia River itself; we will be utilizing an intake structure similar to that being utilized on the WMPT-2 unit.

The plant liquid discharges at the Skagit site -- we had a diffuser on our discharge line going into the river. At the Hanford Reservation, because we are discharging into the Columbia River which is a large, fast-moving body of water, we are going to a single core discharge rather than a diffuser.

On our liquid rad waste release that we were committed to at Skagit, as we went to the new site we decided that we would retain the system design itself. In other words, the physical equipment within the liquid rad waste system would remain the same.

It would still be our objective not to release anything to the environment; however, we did take a look at what was occurring in industry and observed at a lot

of operational plants that they were having difficultie with excess inventory of water during periods of times such as refueling.

Because we knew that there was this difficulty with all this excess amount of treated water, we have provided provisions in the plant where liquid rad waste can be released to the Columbia River. This has been discussed and presented in our PSAR and SER.

At our original site we were going to discharge the sanitary waste through the local communities to be released there. Because of the remoteness of the Hanford site, we will be treating sanitary waste on the site.

In the electrical area we've made the following changes. The first one is the plant load itself. The biggest reason was the addition of the fans and the cooling towers, which is a fairly significant load to place on a system. There have also been a few other increases in our plant loads. We've got a change in pumping head from the river to the plant site. We are puming the water approximately seven miles from the river up to our site, so we've had a few additional other changes.

Our transmission interface has changed, and on my next slide I will show that in a little more detail.

And the following point -- simply because we are in a different place or site, our access roads and railroads are obviously different.

MR. EBERSOLE: Would you explain why you went to forced change the cooling towers?

MR. HACKING: AT the original site, our towers had already reached a great height just due to the climate there. We were already up over 500 feet; about 500 feet I think is what the design was. As we went to the Hanford Reservation, if we retained the same tower the tower would have increased approximately 100 feet higher, which is pushing the state of the art. We felt like the benefit was no longer economically to our advantage.

Rather than push the state of the art and go through a whole new design, we went back to the mechanical draft cooling tower.

MR. EBERSOLE: I thought the new site was dryer and hotter.

MR. HACKING: It is, but the air itself is less dense.

MR. EBERSOLE: Okay.

MR. HACKING: And the density of the air determines the height of the tower.

MR. BENDER: As I understand it, you are

retaining the same D value for this site as for the original Skagit site.

MR. HACKING: That's correct.

MR. BENDER: What about the design spectrum? The fact that you've got different foundation conditions? How does the site change influence that?

MR. HACKING: We asked Bechtel Corporation to look at this because we wanted to retain the structures as designed as nearly as possible, as well as the piping systems' design to date. Bechtel took a preliminary look at it and determined that we could pretty much retain the structures themselves. There was not that much difference in the design.

As you go to the soil site, the soils-foundation interface, it's a little bit softer of a spectra. Therefore, we have really not got that much conservatism in the design that assured ourselves that the design should remain intact. However, we will go through a final calculation and determine whether a change needs to be made.

MR. BENDER: There will be a re-analysis?

MR. HACKING: That's correct, there will be a final analysis of the redesign.

MR. BENDER: Thank you.

(Slide.)

MR. HACKING: This next slide shows -- I hope you can see that; I think it's in your handout. This slide physically shows the substations located on the Hanford Reservation and how the Skagit/Hanford substations would interface with the other substations.

The one shown in the middle of the figure would be our substation itself; the one located right next to our plant. The one here at the bottom of the page is the Ashe sub-switching station that presently exists on the reservation. It is in close proximity to the WPU units.

The substation shown at the top of the page is called the Hanford Substation; it's located up in close proximity to the N reactor itself. This is roughly 10 miles to the west of where we are. These are physically separated by up to 20 miles' difference.

Coming from both of these substations we have two 500 kv lines; two coming up from the Ashe Substation to the south, and we have two 500 kv lines coming down from the Hanford Substation to the north.

Now, these four 500 kv lines tie into an energized grid in our substation itself, and these two dark lines at each end of the substation represents a bus. Off of these lines will be taken our class 1E bus.

I would like to point out that as we go to

either one of these connecting substations, the Hanford Substation, for example, we have 500 kv lines coming into that substation from three separate directions. The arrows are pretty much physically pointing to the direction the power is coming from and the intertie.

The substation to the south has two power connections coming in, shown here on each side of it, as well as the unit Supply Systems themselves. They will be interfacing with this substation here (indicating).

Maybe it is not obvious, but with these four lines coming into our substation, we can remain connected to the grid in the event that we lose one or as many as three of these lines, so that we physically can remain energized to the grid or retain power from the grid in the event we lose power in our own station.

MR. RAY: Does one line have the emergency thermal capability to take the total output of the plant?

MR. HACKING: Yes. One line could carry the output of this plant. That's correct.

MR. RAY: When we reviewed the Supply System unit logic, we understood that Bonneville ha a practice of making bulk power stability systems studies to insure that the worst fault condition would not cause instability of a major generating facility, and particularly the one onsite.

MR. HACKING: That's correct.

MR. RAY: I don't know whether when you moved your proposed location of the plant to this location -- but do you know if Bonneville has updated those studies to indicate the presence of your facilities?

MR. HACKING: That's correct. We have conducted on this site up to 17 stability studies. The assumptions of some of them were critical cases or loss of the WMPU-2 unit, which is in close proximity to our plant, as well as the double-faulted zone. These are addressed in our PSAR.

MR. RAY: Did your organization makes those studies or did Bonneville?

MR. HACKING: They have been performed by Puget and I think they've been done in concert with the BPA organization.

MR. RAY: So the bulk power system, somewhat understanding the total system --

MR. HACKING: Not all of these characteristics exist today. Some of these are proposed lines and will be there in the event our plant is constructed.

MR. RAY: How many of them will be inter-connected into your substations?

MR. HACKING: All four of these lines.

MR. RAY: I noticed in one of your earlier

maps the delineation of a transmission corridor. It was labeled that way, which presumably shows the approach of these four lines.

MR. HACKING: That's right.

MR. RAY: Do they all come in the one corridor?

MR. HACKING: Yes. I do have a slide here showing that.

MR. RAY: My concerns would be the physical separation between those lines on that corridor, and the possibility of a terminal involving three or all of them.

(Slide.)

MR. HACKING: On this slide, this represents the 500 kv lines going between the Ashe Substation and the Hanford Substation to the north. What it basically is, is the two lines loop into and out of our substation itself at the Skagit/Hanford Nuclear Project. The only place there are four lines in a single corridor is between this point (indicating) and out to where the 500 kv lines currently go.

MR. RAY: How long is the corridor?

MR. HACKING: I am having to guess off the top of my head. Each one of these is a section of land here. That is roughly about 2 1/2 to 3 miles The exposure is small.

I also have a slide here showing the physical

arrangements of the tower itself within that corridor.

(Slide.)

Right here, we have the line coming in. We are using four sets of towers. Each of the towers is split apart by 100 feet on each side with 300 feet between the two sets of lines coming in.

MR. RAY: How high is the tower? Can the tower topple over -- one line topple over and involve the other ones?

MR. HACKING: It could between two sets of towers, but not across the larger gap.

MR. RAY: But your stability studies included that kind of a fall, I presume?

MR. HACKING: It included up to a loss of two lines, that's correct.

MR. EBERSOLE: Is the design basis for those towers -- I'm rather sure it doesn't include tornado winds; is that right?

MR. HACKING: They were designed by Bonneville Power Administration and they're designed for high winds and seismicity. I'm not sure of the exact wind loading.

MR. EBERSOLE: Applicants quote a return frequency severe enough to take down such lines.

MR. HACKING: That might have been shown on an earlier slide. We have that number here but I don't

recall it off the top of my head.

MR. EBERSOLE: It has to be compatible with the reliability of the diesel plants because if you knock all those down, I gather you cannot carry house load on the main turbines because of instability. So you are dependent, in essence, on one diesel per unit, assuming the other one might not have started.

MR. HACKING: We have three diesels in each of the units.

MR. EBERSOLE: I'm talking about decay heat energy removal.

MR. HACKING: That's correct.

MR. EBERSOLE: If one arbitrarily fails, you're hanging on one, should you use these lines. One per unit.

MR. HACKING: That's right.

MR. EBERSOLE: Do you think the tornado frequency and the diesel reliability makes a competent set of conditions for your plant?

MR. HACKING: I think it does, but I would like for my staff here to check that just momentarily and maybe give us an answer back.

MR. STIMAC: We will attend to that, Mr. Hacking.

MR. RAY: While that's being done, could I ask

another question?

MR. HACKING: Please do.

MR. RAY: In your earlier map where you show the interconnection of 500 kv substations, there was an indication of the approaches of g1 and g2. Are these aerial generator leads?

MR. HACKING: The g1 and g2 here represent the generator leads themselves coming from each of the two units.

MR. RAY: Are they transmission type tower construction?

MR. HACKING: These are underground lines going out to the substation itself.

MR. RAY: So there's no physical possibility of a common fall on those leads.

MR. HACKING: We don't anticipate any, that's correct.

MR. RAY: Thank you.

(Slide.)

MR. HACKING: Continuing with my presentation, I would like now to address some of what we are entitling "future design considerations." We have established within the Puget/NESCO organization a feedback program; a program which keeps us attuned to the industry. We are keeping our eyes and ears and

personnel out in the industry so that we can take the experience from the industry and take it from design considerations yet to be made in the future.

Examples of this are we are members of various owners' groups. We've participated in a number of owners' groups in the past and continue to participate in the owners' groups. We are members of the owners' group for the TMI issues, members of the hydrogen control group, the containment issues owners group addressing the other owners groups.

We participate in the INPO information program, and particularly, the CN program that generates information from the INPO organization with regard to significant events. We are factoring those into our future design considerations.

Puget is a member of the EPRI organization. We likewise receive all of the documentation from EPRI and participate in some of those programs. We also monitor and receive all copies of the IE bulletin circulars and notices circulated by the NRC staff. We review those and put those into our designs as well as NUREGs or any other documentation that may be issued from the Nuclear Regulatory Commission.

Examples that were brought out in our subcommittee meeting at Richland, as well as some of

those mentioned here today, are that we are currently aware of those and are monitoring in the industry. We have equipment qualification of the hydraulic control units and the control rod drive system. We are aware of the problem associated with the scram discharge volume, particularly the one that was identified on the Browns Ferry unit. We are following the evolution of that design.

We have not implemented changes as of today in our plant, but we are aware of these considerations, and these will be factored back into our design upon reactivation of the design. We are aware of the fuel channel box deflection problems that have been addressed between GE and the staff, and we continue to monitor that problem and the results of it.

Another area mentioned this morning was with regard to the inter-granular stress corrosion cracking. At the time the owners group formed an owners group program we became members of that owners group and participated in the original funding of a lot of those programs that the owners group undertook. At the current time we are not currently a funding member of the owners group, but upon engineering reactivation we plan to go back to the owners group and receive from them additional information that has been generated

since we are no longer a funding member, and will pick up our funding at that time.

With respect to the inter-granular stress corrosion cracking, we reviewed all the piping within the plant, we identified the piping under suspicion, and as Mr. Newkirk identified, this piping physically exists in our warehouse today.

We have committed to the NRC that we will meet the NUREG. We have a program in place inhouse to identify the needs of our plant -- let me rephrase that.

What we are doing is actually setting up a program and it is tied into key decision points. There will come a time in our future where if we are going to procure new piping, we need to know that. So our decision will be made prior to that date, as we go back into engineering reativation.

But in this period of time, we are continuing to monitor what's going on in the industry and getting input from other organizations as to what their experience has been, and we will factor that into our input as well. We continue to monitor the evolving regulatory requirements.

We are looking at some of the unresolved safety issues that have not been resolved on the NRC staff. We will monitor the resolution of those generic issues, and where they impact our design, we will take those into consideration as well as any NUREG requirements that are identified in the future. We will continue to monitor those as well.

We have committed to a probabilistic risk assessment program or PRA program. This was in response to the NCPT rule. We prepared a program and submitted it to the NRC under their guidance. This program was submitted in our TMI submittal approximately a year and a half ago.

The objective of the program is to improve the reliaiblity of the core and heat removal. We continue to monitor the PRA programs conducted in the industry. We received a number of them, and copies of the program are already completed. We will continue to monitor and involve ourselves in tracking those programs so that we can identify any significant changes or any significant plant requirements, and can factor those into our design at the appropriate time.

Our intent on the PRA program is to involve our staff, Puget, and NESCO staff in that program itself. We intend to use the experts available in the

field. We will be utilizing them as consultants and having them implement the actual studies themeslves. However, we do not intend to turn that program blindly over to these people, but we will remain involved and participate in the management of those programs, and particularly in the implementation. As design decisions are made, we will be the place where those decisions occur.

The intent of all three of these programs is to help us keeping our eyes and our ears turned to the industry and monitoring what is going on around us. We plan to continue in our owners' group activities, and plan to keep ourselves well appraised as to what is going on in the industry.

I hope this has addressed a number of the concerns. If there are any questions --

MR. EBERSOLE: Let me go back to the original question I asked. In the course of making the inquiry into the vendor designs, I think you have a right and perhaps a considerable obligation to ask the questions such as that on the scram system. Why is it that in this system you start with apparent individual competence, some of these 185 or 200 rods, and then succumb to the commonality of a common dump volume that you close before you get the rods in.

For what fundamental logical reason do you have a common volume, and two, why do you close it before you assure that these rods are home? Do you ask these questions?

MR. HACKING: We have not asked those particular questions, but we have asked questions similar to that in our review with Bechtel, and particularly when we reviewed the NSSS with Bechtel and GE.

MR. EBERSOLE: You don't have answers to those questions then?

MR. HACKING: I believe General Electric would be the one to address that. Those decisions were made within their organizations, and we have not asked those specific questions to them.

MR. EBERSOLE: You know the importance of the semi-automatic relief system on your design. This is the system that permits blowdown?

MR. HACKING: Oh, yes, our safety relief valves.

MR. EBERSOLE: You know that is dependent on activated solenoids in hostile environments.

MR. HACKING: Yes.

MR. EBERSOLE: Do you ask why do I have to have such vulnerable equipment in such vulnerable

environments when a non-hostile environment is available?

MR. HACKING: We have not asked that particular one, but we have assured ourselves that the environmental qualifications for the equipment have been identified, and they have been picked up by the Bechtel Corporation, and they are meeting those requirements.

MR. EBERSOLE: What you are saying is, there were dependencies found, so an effort was made to qualify the equipment against those dependences?

MR. HACKING: That is correct. Making sure the interfaces were correctly identified within the organization.

MR. EBERSOLE: I guess you would have to agree that it would be better if you didn't have such dependencies in the first place. Do you look at your designs in that context?

MR. HACKING: To a certain extent we do, but we do not go back in and look at the original NSSS design. We look at what is going on in the industry, and as things are identified, we try to pick up those and factor them into our design considerations.

MR. EBERSOLE: One other question. I didn't see in your SER any discussion of the water cooling -- the cooling system of the containment and the pump

seals. That has always been an interesting system. Can you tell me how that works at your plant?

MR. HACKING: The cooling of the containment is done by our RHR system, similar to all the MARK III containments.

MR. EBERSOLE: I am talking about atmosphere and cooling during operations.

MR. HACKING: We have located within the dry well itself, we have dry well coolers that maintain the atmosphere within the dry well. Our containment likewise has air cooling mechanisms to cool that air in and out of the containment.

MR. EBERSOLE: What about the seal system. Is that a cooling system that cools the pump seals?

MR. HACKING: I will have to defer that back to the table. I could answer, but I am not sure I would give you the absolute answer.

MR. EBERSOLE: It just was not in the SER.

MR. HACKING: We will have somebody check on that answer. Is there another question I might answer in the interim?

MR. EBERSOLE: No.

MR. MARK: I suppose if someone feels prepared to comment, that would be fine.

MR. HACKING: We are getting that answer right

now.

MR. MARK: Is there anything else for Mr. Hacking?

(No response.)

MR. MARK: If not --

MR. HACKING: Thank you very much.

MR. MARK: Any other questions for the applicant group?

(No response.)

MR. MATHIS: Before I turn the meeting back to our chairman, do you have any word on Mr. Myers?

MR. MYERS: I am here.

MR. MARK: That is a pretty good word. I am sorry our questions caused you such distress.

MR. MYERS: It was our intent to come here and put on a very impressive show.

(General laughter.)

MR. MYERS: I suspect we succeeded, although not quite in the way that we had intended, but I am alive and well, and apparently did not get enough sleep last night in coming out on the trip from the west coast. But thank you.

MR. MARK: Well, I think there is nothing else except that one comment.

MR. RAY: Are you prepared for that?

MR. STIMAC: We are looking into it.

MR. RAY: But you don't have it now?

MR. EBERSOLE: Well, I wouldn't hold up the meeting for that detail.

MR. HACKING: We have made a commitment that the cooling recirculation pumps will be designed to seismic category 1, which I think is equivalent to the other MARK III units as well. That is identified in the SER supplement number 1, which was issued some time ago.

MR. EBERSOLE: Thank you.

MR. MARK: If that is all, I will return the meeting to you.

MR. RAY: Thank you, Dr. Mark. I would like to thank the licensees' representatives for the complete story they presented. It was most interesting. And again, I hope we haven't put you through too much of a grind.

We will have a ten-minute break while Dr. Siess prepares for the discussion to follow on the NRC safety research program and budget. During that time, I would like those who intend to leave the meeting to get out so that there is no noise to disrupt the next session.

(Whereupon, at 11:55 a.m., the Committee was

recessed, to reconvene in Executive Session.)

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

In the matter of: ACRS/274th General Meeting

Date of Proceeding: February 10, 1983

Docket Number:

Place of Proceeding: Washington, D. C.

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Jane N. Beach

Official Reporter (Typed)

Jane N. Beach

Official Reporter (Signature)

SKAGIT/HANFORD NUCLEAR PROJECT

ACRS FULL COMMITTEE MEETING

FEBRUARY 10, 1983

	APPLICANT REPRESENTATIVE	APPROXIMATE TIME
I. SUBCOMMITTEE REPORT		8:45- 9:00 AM
II. INTRODUCTION	M. STIMAC	9:00- 9:20 AM
III. NRC STAFF A. OPEN ITEMS AND COMMITMENTS B. STAFF CONCLUSIONS		9:20- 9:50 AM
IV. ORGANIZATION AND MANAGEMENT	R. MYERS	9:50-10:50 AM
V. SITE CHARACTERISTICS	J. MECCA	10:50-11:30 AM
VI. DESIGN CONSIDERATIONS	D. HACKING	11:30-11:50 AM

SKAGIT/HANFORD NUCLEAR PROJECT

INTRODUCTION
SITE AND PLANT
DESCRIPTION

MICHAEL V. STIMAC
MANAGER LICENSING AND REGULATION
PUGET SOUND POWER & LIGHT COMPANY

T1
Stimac

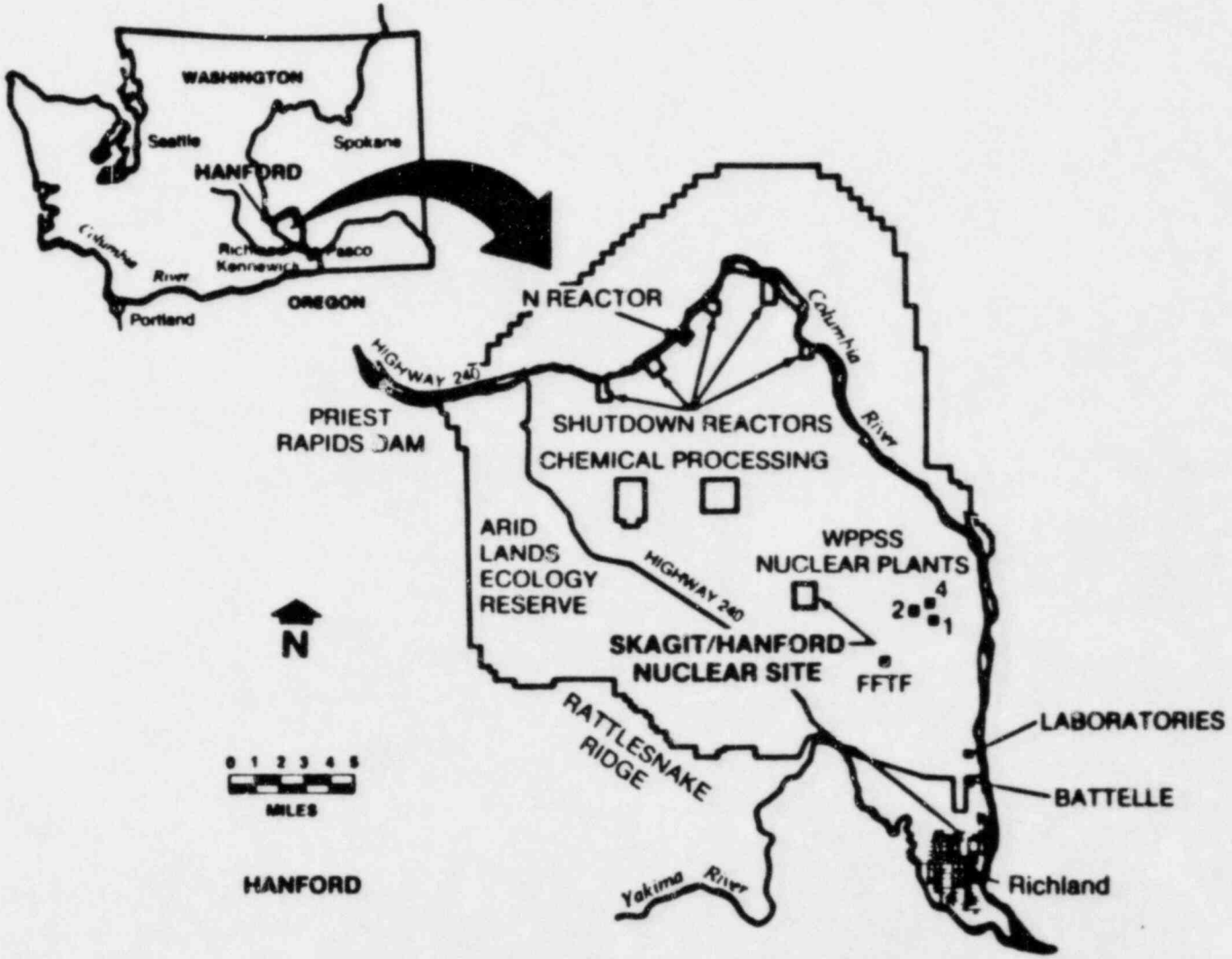
SKAGIT/HANFORD NUCLEAR PROJECT

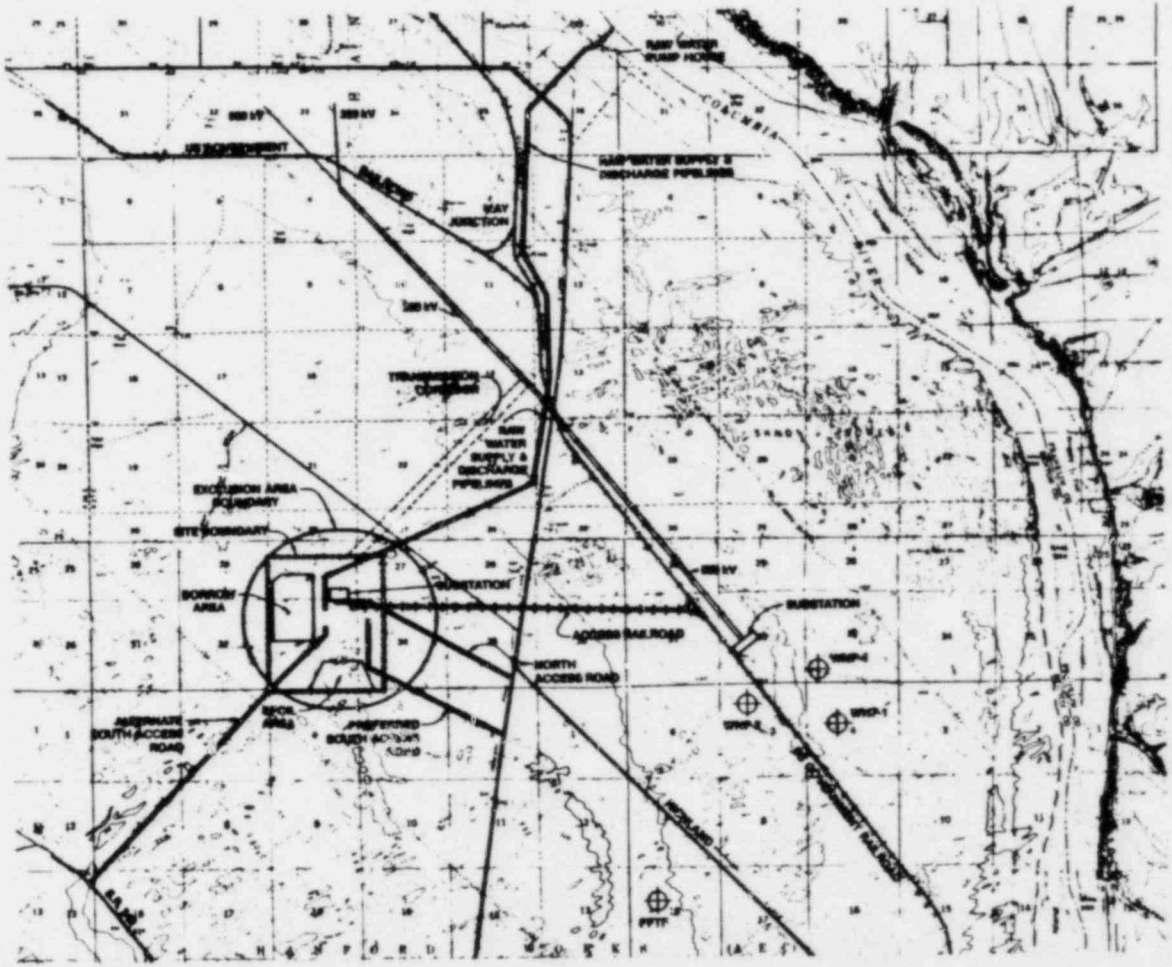
FEDERAL LICENSING SYNOPSIS

JANUARY 1973	— ANNOUNCEMENT OF SKAGIT NUCLEAR POWER PROJECT
AUGUST 1974	— LICENSE APPLICATION FILED ENVIRONMENTAL REPORT (ER) PRELIMINARY SAFETY ANALYSIS REPORT (PSAR), CHAPTER 2
SEPTEMBER 1974	— APPLICATION AND ER DOCKETED
DECEMBER 1974	— REMAINDER OF PSAR FILED
JANUARY 1975	— PSAR DOCKETED
MAY 1975	— FINAL ENVIRONMENTAL STATEMENT (FES) ISSUED
JULY 1975	— SITE SUITABILITY AND ENVIRONMENTAL HEARINGS BEGAN
SEPTEMBER 1977	— SAFETY EVALUATION REPORT (SER) ISSUED — ACRS SUBCOMMITTEE MEETINGS
NOVEMBER 1977	— ACRS FULL COMMITTEE MEETING (211) — ACRS LETTERS ISSUED NOVEMBER 15 AND 18
OCTOBER 1978	— SER SUPPLEMENT NO. 1 ISSUED
MARCH 1979	— THREE MILE ISLAND ACCIDENT
NOVEMBER 1979	— REZONE AGREEMENT NOT EXTENDED
JULY 1980	— DECISION TO MOVE TO HANFORD
SEPTEMBER 1980	— LICENSE APPLICATION AMENDED FOR SITE CHANGE
JULY/SEPT 1981	— PSAR AMENDMENTS 21 & 22 SUBMITTED ON TMI REQUIREMENTS
OCTOBER 1981	— TITLE CHANGED TO SKAGIT/HANFORD NUCLEAR PROJECT — SER SUPPLEMENT NO. 2 (TMI) ISSUED
DECEMBER 1981	— SITE CHANGE AMENDMENTS SUBMITTED
APRIL 1982	— DRAFT ENVIRONMENTAL STATEMENT (DES) HANFORD SITE
DECEMBER 1982	— SER SUPPLEMENT NO. 3 ISSUED
JAN 24 & 25, 1983	— ACRS SUBCOMMITTEE MEETING
FEBRUARY 10, 1983	— ACRS FULL COMMITTEE MEETING

SKAGIT/HANFORD NUCLEAR PROJECT

AREA MAP

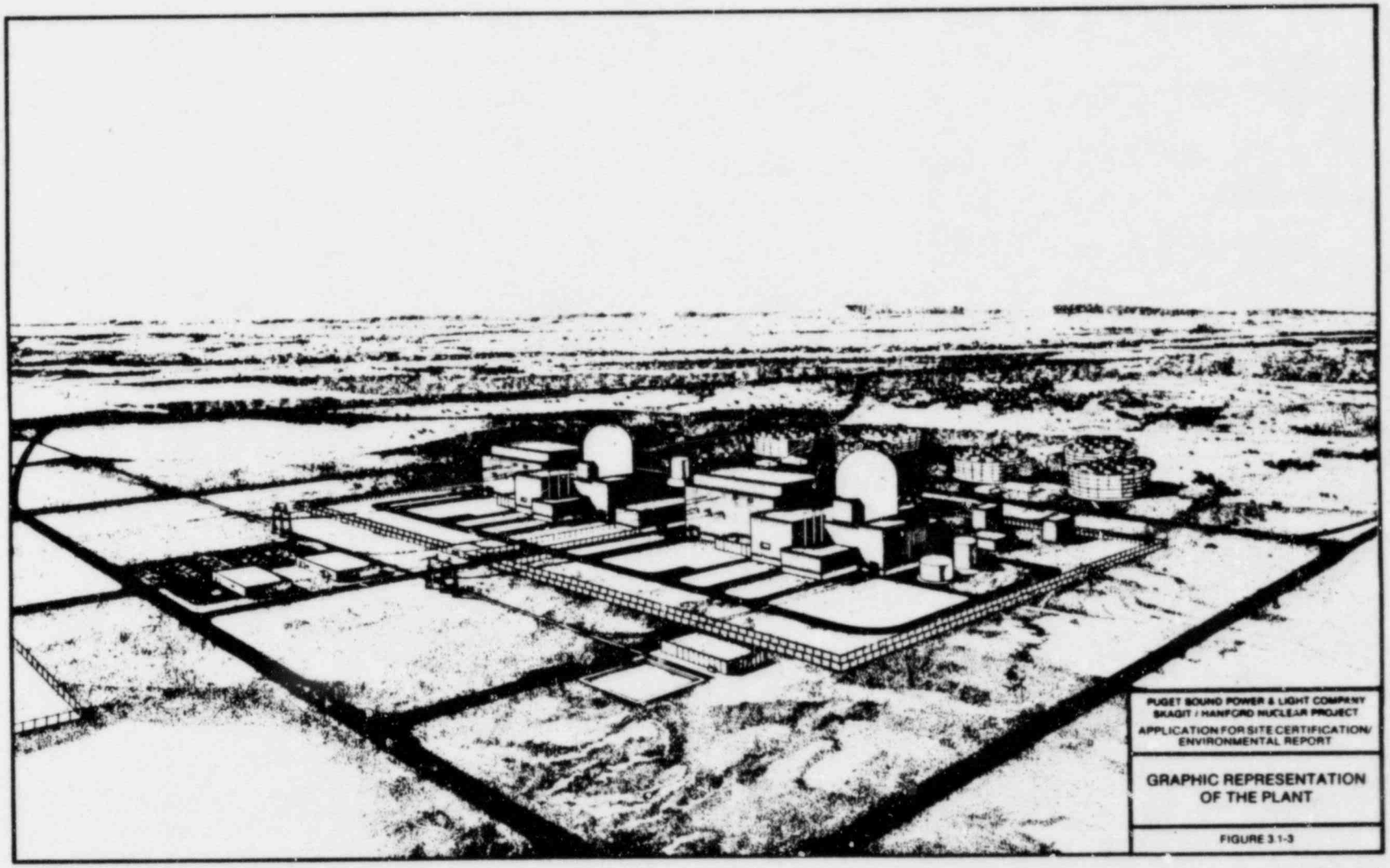




PUGET SOUND POWER & LIGHT COMPANY
SKAGIT/HANFORD NUCLEAR PROJECT
APPLICATION FOR SITE CERTIFICATION/
ENVIRONMENTAL REPORT

TOPOGRAPHIC FEATURES IN THE VICINITY OF THE SITE AND ASSOCIATED AREAS

FIGURE 2.1-1a



PUGET SOUND POWER & LIGHT COMPANY
SKAGIT / HANFORD NUCLEAR PROJECT
APPLICATION FOR SITE CERTIFICATION/
ENVIRONMENTAL REPORT

GRAPHIC REPRESENTATION OF THE PLANT

FIGURE 3.1-3

INTRODUCTION

- REVIEW FOR SKAGIT SITE, NSSS, BOP
  - SAFETY EVALUATION REPORT 9/77
  - ACRS LETTER 11/77
  - SER SUPPLEMENT NO. 1 10/78
- REVIEW FOR TMI-RELATED REQUIREMENTS
  - SER SUPPLEMENT NO. 2 10/81
  - FINAL RULE CONFORMANCE 2/82
- REVIEW FOR SKAGIT/HANFORD SITE
  - PSAR AMENDMENT 23 12/81
  - SER SUPPLEMENT NO. 3 12/82

C.
T2 - Moon

PRINCIPAL ISSUES
SKAGIT/HANFORD SITE

- o AUTHORITY TO CONTROL ACTIVITIES IN EXCLUSION AREA
- o NEARBY FACILITIES
  - TRANSPORTATION OF AMMONIA
  - EXTREMELY HAZARDOUS WASTE DUMP
- o METEOROLOGY
  - WNP-2 SITE DATA
  - ACCID. DOSES ENVELOPED BY SKAGIT CALCULATIONS
- o HYDROLOGICAL ENGINEERING
  - LOCAL FLOOD - ROOF LOADS
  - STAFF REVIEW OF UHS
- o GEOLOGY
  - WNP-2 REVIEW APPLICABLE
  - S/HNP - SITE/NEAR SITE INVESTIGATIONS
  - MAY JUNCTION MONOCLINE - ADDITIONAL SUBSURFACE DATA NEEDED
- o SEISMOLOGY
  - SSE/OBE USED FOR SKAGIT SITE ACCEPTABLE FOR S/HNP SITE

PRINCIPAL ISSUES
SKAGIT/HANFORD SITE
(CONT'D)

- SUBSURFACE MATERIAL AND FOUNDATIONS
- MASONRY WALLS
- FACILITY OPERATION IN S/HNP SITE ENVIRONMENT
- APPENDIX I REVIEW - COST-BENEFIT ANALYSIS
- EMERGENCY PLANNING - 12/80 NEW RULE
- UNRESOLVED SAFETY ISSUES (USI's)

STAFF CONCLUSIONS

- APPLICATION ACCEPTABLE FOR CP IN 10/78 EXCEPT FOR SKAGIT SITE ISSUES
- NO MAJOR FACILITY CHANGES REQUIRED FOR SKAGIT/HANFORD SITE
- SKAGIT/HANFORD SITE CONDITIONS WILL BE ACCOMMODATED IN THE FINALIZATION OF DESIGN AND OPERATING PROCEDURES
- USI RESOLUTIONS WILL BE IMPLEMENTED
- REQUIREMENTS OF RULE FOR TMI-RELATED REQUIREMENTS FOR CP/ML HAVE BEEN MET
- PROVISION OF SUBSURFACE DATA FOR MAY JUNCTION MONOCLINE CAN BE ASSURED BY CP CONDITION
- STAFF SAFETY REVIEW IS COMPLETE AND PROVIDES BASIS FOR DECISION TO ISSUE CP
- ASLB PREHEARING ACTIONS 1/17 - 4/28/83
- ASLB EVIDENTIARY HEARING START 5/17/83 (TENTATIVE)

ERRATA

SAFETY EVALUATION REPORT

SKAGIT/HANFORD NUCLEAR PROJECT
UNITS 1 AND 2
DOCKET NOS. STN 50-522 and 50-523

NUREG-0309

Supplement No. 2

Page ix line 3 change "in eastern Washington" to "in northwestern Washington"

Supplement No. 3

Page 2.6 1st full paragraph

line 3 change "360" to "300", change "3" to "2.25"
line 4 change "1" to "1.2"
line 4 and 5 change "closer to the more stringent Class I..." to "are the values for the more stringent Class II..."

Page 2.7 3rd paragraph

line 3 change "address" to "meet"
line 5 change "upgrade the" to "implement an"
line 6 change "The upgraded" to "This"

Page 11.3 3rd full paragraph

lines 5, 6 and 7 delete the sentence "Similarly, the doses from liquid releases resulted in gross cost-assessment values of $870 for the total body person-rem dose and $6150 for the person-thyroid-rem dose."

Page 11.6 Table 11.2

4th line from bottom (Cs-136) Column "Auxiliary building vent" change "3.0×10^{-1} to 3.0×10^{-4}

SKAGIT/HANFORD NUCLEAR PROJECT

SITE CHARACTERISTICS

JAMES E. MECCA
MANAGER — SAFETY
NORTHWEST ENERGY SERVICES COMPANY

SKAGIT/HANFORD NUCLEAR PROJECT

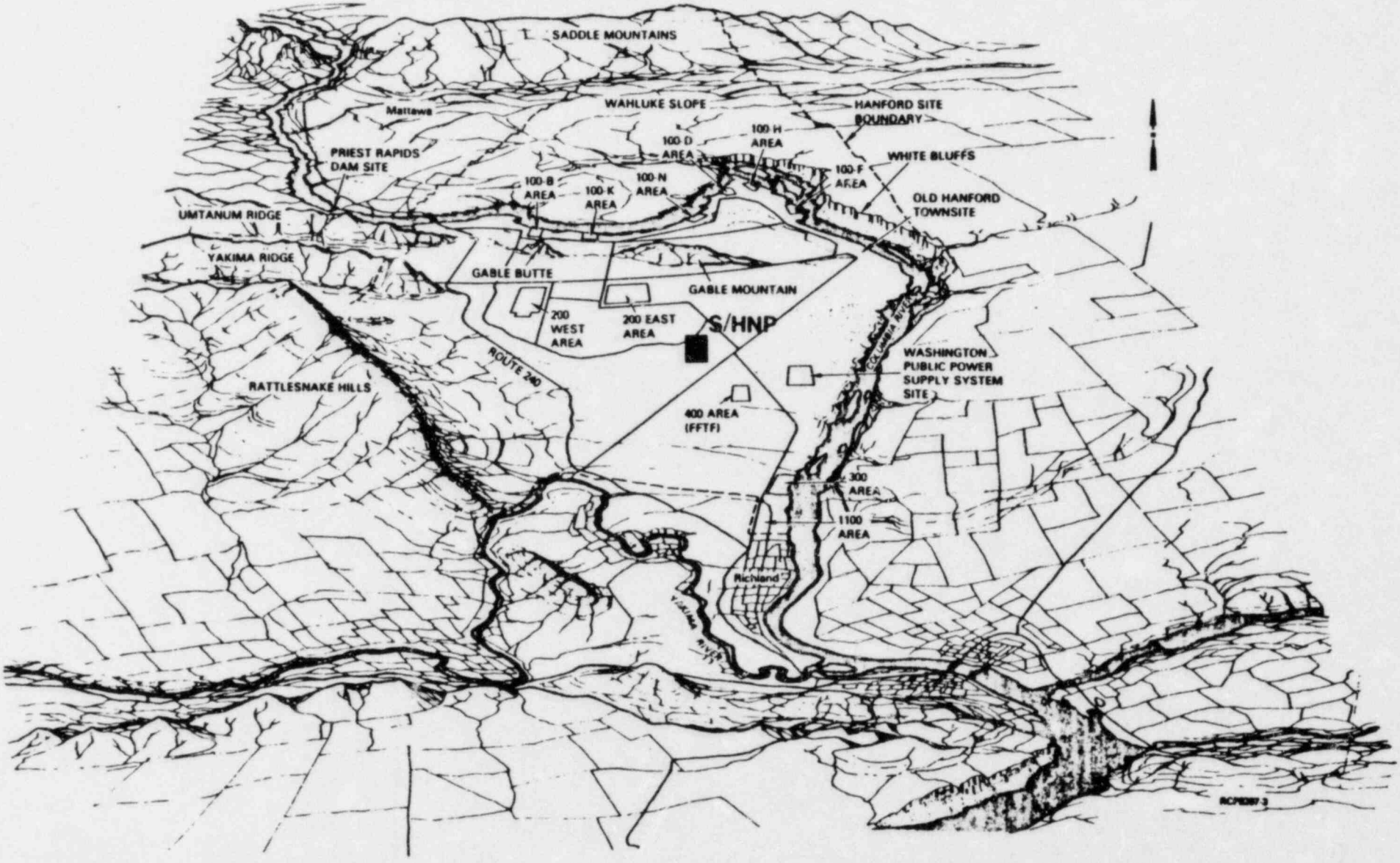
CHARACTERISTICS REVIEWED

- GEOGRAPHY/DEMOGRAPHY
- NEARBY FACILITIES
- METEOROLOGY
- HYDROLOGY
- GEOLOGY AND SEISMOLOGY

SKAGIT/HANFORD NUCLEAR PROJECT

THE HANFORD RESERVATION

AFTER ROCKWELL INTL., 1982



SKAGIT/HANFORD NUCLEAR PROJECT

GEOGRAPHY AND DEMOGRAPHY

- SITE: 1,200 ACRES
- EXCLUSION AREA BOUNDARY: 1 MILE RADIUS
- LOW POPULATION ZONE: 4 MILE RADIUS
- NEAREST RESIDENT: 7.5 MILES
- 0-10 MILE 1990 POPULATION
  - — 520 RESIDENTS
  - — 6,200 INDUSTRIAL WORKERS
- 0-50 MILE 1990 POPULATION — 340,000
- NEAREST POPULATION CENTER — NORTH RICHLAND (12 MILES)
- CONCLUSION:
  THE EXCLUSION AREA, LOW POPULATION ZONE AND POPULATION CENTER DISTANCE MEET THE CRITERIA OF 10 CFR 100

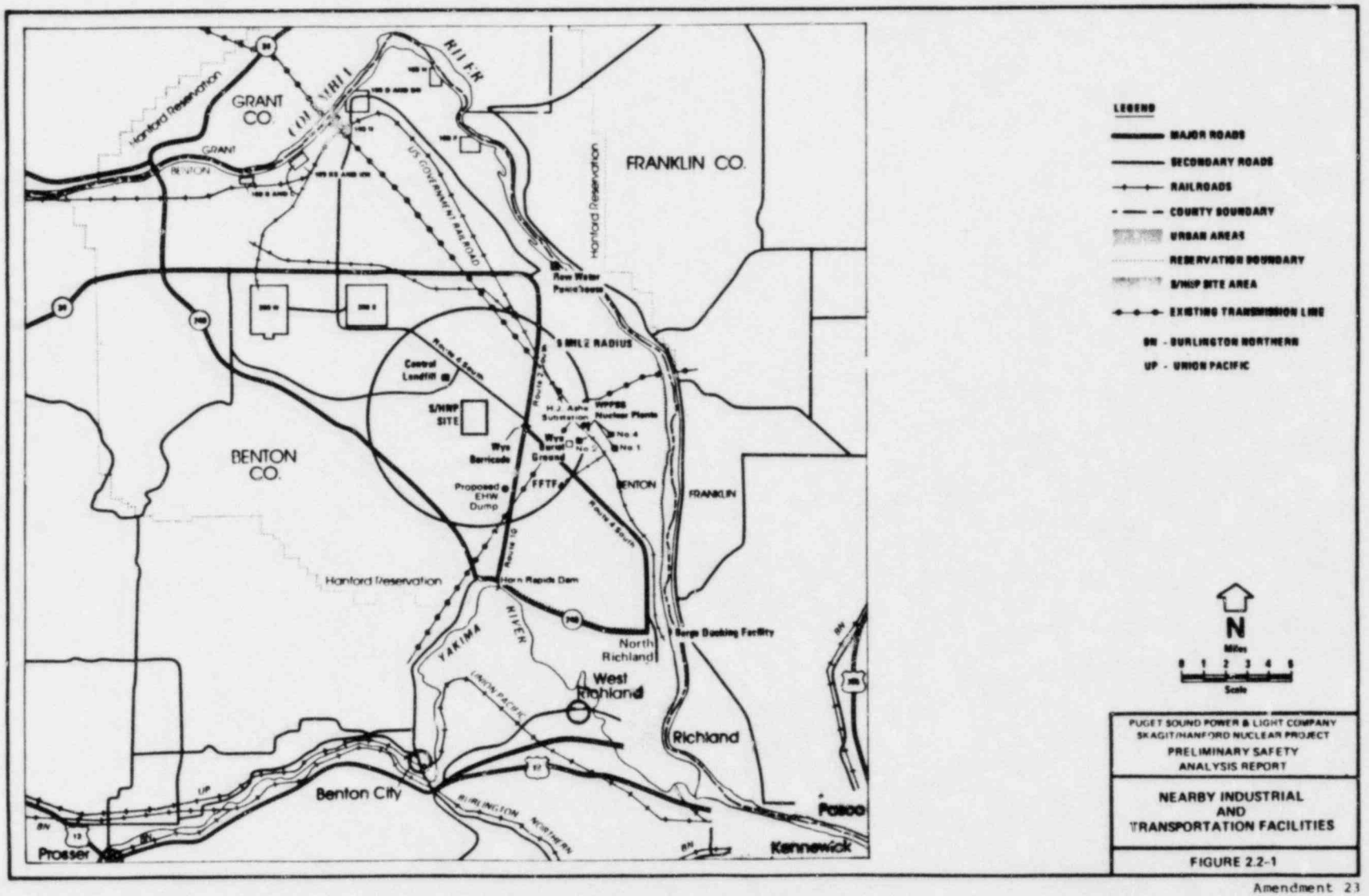
SKAGIT/HANFORD NUCLEAR PROJECT

NEARBY FACILITIES EVALUATED

- FFTF
- WNP-2
- WYE RADIOACTIVE WASTE BURIAL GROUND
- PROPOSED SITE FOR HAZARDOUS WASTE DISPOSAL
- ROADS AND RAILROADS
- COLUMBIA RIVER
- AIR TRAFFIC
- PIPELINES

CONCLUSION:

- PLANT IS ADEQUATELY PROTECTED IN ACCORDANCE WITH THE GUIDANCE OF SRP SECTIONS 2.2, 3.5.1.5 AND 3.5.1.6 AND GDC 4, "ENVIRONMENTAL AND MISSILE DESIGN BASIS"
- CONTROL ROOM HABITABILITY DESIGN MEETS THE GUIDANCE OF NUREG-0718 (REV. 2), ITEM III. D.3.4 AND 10 CFR 50, APPENDIX A, GDC 19



PUGET SOUND POWER & LIGHT COMPANY
SKAGIT/HANFORD NUCLEAR PROJECT
PRELIMINARY SAFETY ANALYSIS REPORT

NEARBY INDUSTRIAL AND TRANSPORTATION FACILITIES

FIGURE 2.2-1

SKAGIT/HANFORD NUCLEAR PROJECT

METEOROLOGY

- DIFFUSION OF EFFLUENTS DOMINATED BY TOPOGRAPHICAL FEATURES GREATER THAN 10 MILES FROM SITE
- WNP-2 DATA DETERMINED TO BE APPLICABLE

SKAGIT/HANFORD NUCLEAR PROJECT

HYDROLOGY

COLUMBIA RIVER PMF — 80 FEET BELOW TOP-OF-BASEMAT

LOCAL PMF — 1 FOOT BELOW TOP-OF-BASEMAT

LOW WATER — RIVER REGULATED MINIMUM FLOW IS 36,000 CFS

DEPTH TO GROUNDWATER — 125 FEET

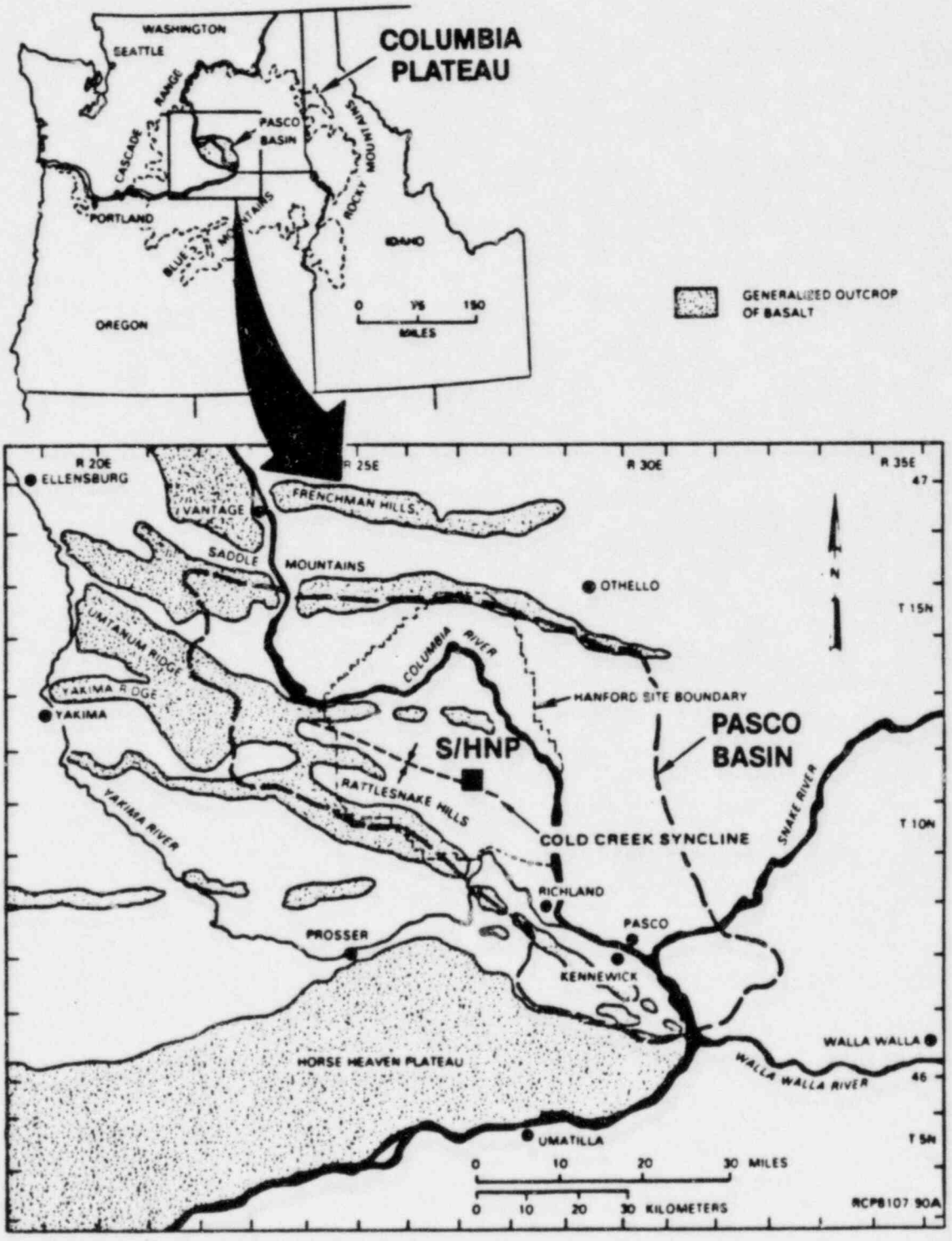
CONCLUSIONS:

SITE AND FACILITIES MEET THE REQUIREMENTS OF 10 CFR 20, 10 CFR 50 AND 10 CFR 100 AND THE GUIDANCE OF SRP SECTIONS 2.4.1 THROUGH 2.4.14 WITH RESPECT TO HYDROLOGICAL ENGINEERING

SKAGIT/HANFORD NUCLEAR PROJECT

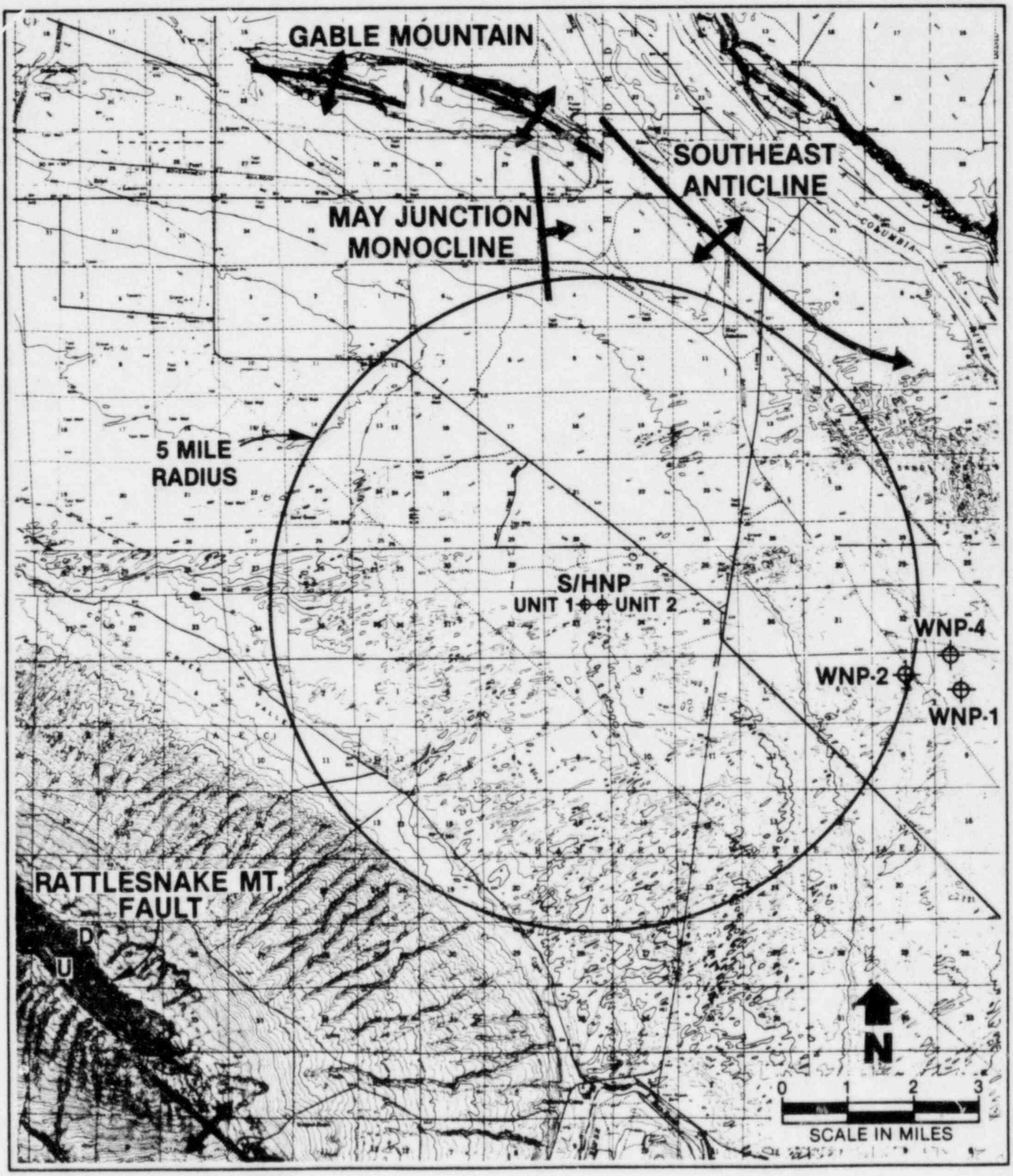
LOCATION MAP, COLUMBIA PLATEAU, PASCO BASIN, HANFORD SITE

AFTER ROCKWELL INTL., 1981



SKAGIT/HANFORD NUCLEAR PROJECT

NEARBY GEOLOGIC STRUCTURES



SKAGIT/HANFORD NUCLEAR PROJECT

ASSUMED EARTHQUAKE SOURCES

- SWARM-TYPE EARTHQUAKE
  M_L = 4.0 AT 9.0 KM

- RATTLESNAKE-WALLULA ALIGNMENT
  M_S = 6.5 AT 15.0 KM *

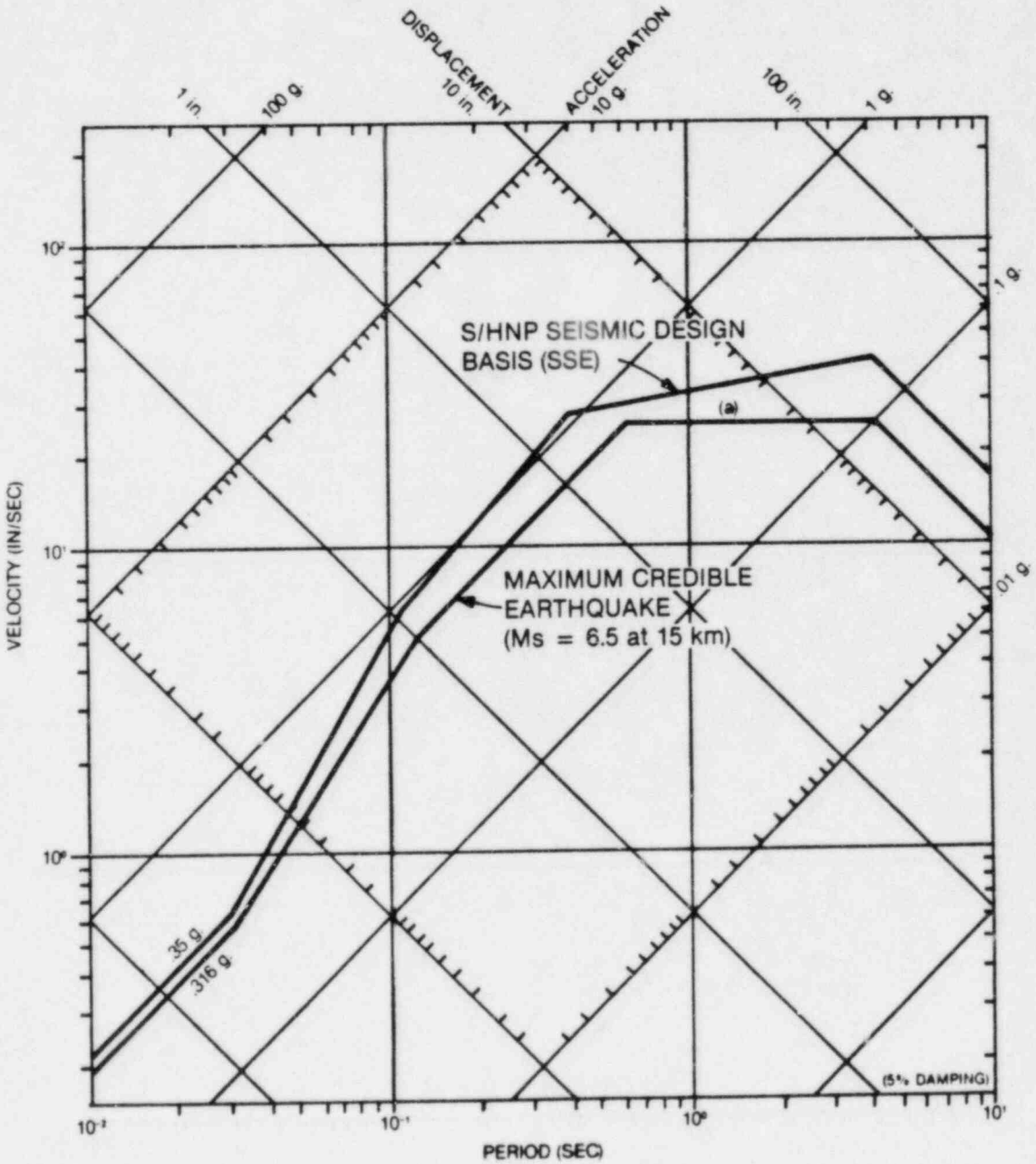
- GABLE MOUNTAIN
  M_S = 5.0 AT 10.2 KM

- LARGEST HISTORIC EARTHQUAKE IN PROVINCE OCCURRING NEAR THE SITE
  $M_L \cong 6.1$ AT $\leq$ 25 KM

  * (CRITICAL EVENT FOR SEISMIC DESIGN)

SKAGIT/HANFORD NUCLEAR PROJECT

COMPARISON OF S/HNP SEISMIC DESIGN BASIS AND MAXIMUM CREDIBLE EARTHQUAKE



EXPLANATION

(a) 84TH PERCENTILE GROUND MOTION VALUES · MEDIAN AMPLIFICATION FACTORS

SKAGIT/HANFORD NUCLEAR PROJECT

GEOLOGY AND SEISMOLOGY CONCLUSIONS

1) SITE AND APPLICANTS INVESTIGATIONS MEET CRITERIA OF 10 CFR 100 APPENDIX A

2) REGION OF LOW SEISMIC ENERGY RELEASE AND SCATTERED, LOW MAGNITUDE EARTHQUAKES

3) MOST DEFORMATION TOOK PLACE PRIOR TO 5 MYBP

4) MAY JUNCTION MONOCLINE IS A SIMPLE MONOCLINAL FOLD

5) GABLE MOUNTAIN AND RATTLESNAKE-WALLULA ALIGNMENT CONSIDERED CAPABLE

6) S/HNP SEISMIC DESIGN CRITERIA (RG 1.60 AT 0.35 G) EXCEEDS THE EFFECTS OF ALL MAXIMUM CREDIBLE EARTHQUAKES

SKAGIT/HANFORD NUCLEAR PROJECT

ORGANIZATION AND MANAGEMENT

ROBERT V. MYERS
VICE PRESIDENT GENERATION RESOURCES
PUGET SOUND POWER & LIGHT COMPANY

T3-Myers

SKAGIT/HANFORD NUCLEAR PROJECT

ORGANIZATION AND MANAGEMENT

- PROJECT OWNERSHIP AND STRUCTURE
- ORGANIZATION & RESPONSIBILITIES

  PUGET
  NESCO

- QA/QC PROGRAM
- TRANSITION TO CONSTRUCTION
- TRANSITION TO OPERATION

SKAGIT/HANFORD NUCLEAR PROJECT

PROJECT OWNERSHIP AND STRUCTURE

OWNERSHIP

- PUGET SOUND POWER & LIGHT COMPANY (40%)
- PORTLAND GENERAL ELECTRIC COMPANY (30%)
- PACIFIC POWER & LIGHT COMPANY (20%)
- THE WASHINGTON WATER POWER COMPANY (10%)

PROJECT STRUCTURE

- PUGET — OVERALL RESPONSIBILITY FOR THE DESIGN, CONSTRUCTION AND OPERATION
- NESCO — PROJECT MANAGEMENT AND ENGINEERING/ CONSTRUCTION DIRECTION AND OVERVIEW
- BECHTEL — A/E, PROCUREMENT AND CONSTRUCTION MANAGEMENT
- GENERAL ELECTRIC — NUCLEAR STEAM SUPPLY SYSTEM
- WESTINGHOUSE — TURBINE GENERATOR
- SELECTED SPECIALTY CONSULTANTS

SKAGIT/HANFORD NUCLEAR PROJECT

PUGET SOUND POWER AND LIGHT ORGANIZATION AND RESPONSIBILITIES

OVERALL RESPONSIBILITY FOR:

- QA ACTIVITIES
- DESIGN
- PROCUREMENT
- FABRICATION
- CONSTRUCTION
- PREOPERATIONAL TESTING
- OPERATION

SKAGIT/HANFORD NUCLEAR PROJECT

NORTHWEST ENERGY SERVICES COMPANY

1. MANAGEMENT AND ENGINEERING SERVICES COMPANY

2. PURPOSE — PROJECT MANAGEMENT FOR MAJOR ELECTRICAL GENERATING PROJECTS OF OWNER UTILITIES

3. ADVANTAGES

   - STRONG TECHNICAL INTERFACE BETWEEN PUGET AND PRINCIPAL CONTRACTORS

     — CONSOLIDATES RESOURCES OF OWNER UTILITIES

   - FACILITATES RECRUITING AND RETENTION OF PERSONNEL EXPERIENCED IN MANAGEMENT AND CONSTRUCTION OF LARGE PROJECTS

   - FUTURE TECHNICAL SUPPORT FOR OPERATIONS AND MAINTENANCE

SKAGIT/HANFORD NUCLEAR PROJECT

NUCLEAR EXPERIENCE OF MANAGEMENT/TECHNICAL STAFF PERSONNEL

INDIVIDUAL	TITLE	COMPANY	TOTAL YEARS NUCLEAR EXPERIENCE	TOTAL YEARS NUCLEAR EXPERIENCE OTHER THAN SKAGIT/ HANFORD
R.V. MYERS	VICE PRESIDENT GENERATION RESOURCES	PUGET	23	13
R.D. HILL	DIRECTOR NUCLEAR PROJECTS	PUGET	24	16
R.A. NEWKIRK	SENIOR STAFF ENGINEER	PUGET	18	12
S.W. MARTSOLF	STAFF ENGINEER	PUGET	16	7
M.V. STIMAC	MANAGER LICENSING & REGULATION	PUGET	14	4
R.N. HETTINGER	MANAGER QUALITY ASSURANCE	PUGET	37	28
W.J. FERGUSON	PRESIDENT	NESCO	32	22
E.V. PADGETT	DIRECTOR QUALITY ASSURANCE	NESCO	25	18
F.A. SPANGENBERG	PROJECT MANAGER	NESCO	19	18
J.E. MECCA	MANAGER SAFETY	NESCO	20	13
T.L. GREBEL	MANAGER LICENSING	NESCO	8	6
D.B. HACKING	PROJECT ENGINEER	NESCO	15	8
V.G. GRAYHEK	SENIOR STAFF ENGINEER	NESCO	28	21
E. NORMAND	SENIOR STAFF ENGINEER	NESCO	13	10
		TOTAL MAN-YEARS	292	196

SKAGIT/HANFORD NUCLEAR PROJECT

RECENT INDUSTRY CONSTRUCTION EXPERIENCE

- REPORTS ON CONSTRUCTION QA PROBLEMS
  - SECY 82-352; ASSURANCE OF QUALITY
  - ANS CONFERENCE
  - EEI QA COMMITTEE
- PRIMARY LESSONS LEARNED
  - FAILURE OF THE PROJECT MANAGEMENT TEAM TO PROVIDE ADEQUATE MANAGEMENT CONTROLS TO PREVENT A SIGNIFICANT BREAKDOWN IN QUALITY FROM OCCURRING
  - FAILURE OF THE OWNER'S QUALITY ASSURANCE PROGRAM TO DETECT THE BREAKDOWN IN A TIMELY MANNER; RECOGNIZE THE TRUE EXTENT AND NATURE OF THE PROBLEMS; AND TO OBTAIN THE NEEDED CORRECTIVE ACTION

T3 4 4
T4

SKAGIT/HANFORD NUCLEAR PROJECT

QA PROGRAM OBJECTIVES

1. KNOW WHAT IS GOING ON
   DON'T RELY ON CONTRACTORS

2. EVALUATE CONTRACTOR'S CAPABILITY BEFORE START OF WORK

3. DO IT RIGHT THE FIRST TIME

4. PROMOTE QUALITY CONSCIOUSNESS THROUGHOUT PROJECT

5. INSTILL PRIDE OF WORKMANSHIP

6. KEEP QUALITY PROBLEMS IN OPEN

SKAGIT/HANFORD NUCLEAR PROJECT

TRANSITION TO CONSTRUCTION

1. PREPARED FOR CONSTRUCTION — NOVEMBER 1977
   - FULLY STAFFED FOR CONSTRUCTION
   - CONTRACTS IN-PLACE
2. PROJECT CURRENTLY ON HOLD
   - MANPOWER CUT-BACK
   - ACTIVITY TO SUPPORT CP LICENSING AT NEW SITE
   - RESTUDY PROJECT FOR DECISION TO PROCEED
3. PREPARATION FOR START OF CONSTRUCTION STARTS WITH CP AND DECISION TO PROCEED
   - MAINTAIN CP COMMITMENTS
   - MANPOWER BUILD-UP
   - CONSTRUCTION PLANNING
   - OPERATIONS PLANNING
4. START CONSTRUCTION
   - FULL STAFF
   - FULL QA PLAN IN PLACE
   - DESIGN RE-START
   - PROGRAM REVIEW AGAINST INPO CRITERIA FOR CONSTRUCTION PROJECTS

SKAGIT/HANFORD NUCLEAR PROJECT

TRANSITION TO OPERATION

- PUGET STAFF WILL OVERSEE DESIGN AND CONSTRUCTION
- NESCO RESIDENT ENGINEERING STAFF WILL BE ENCOURAGED TO TRANSFER TO OPERATIONS OR ENGINEERING SUPPORT GROUPS
- PUGET TECHNICAL SUPPORT WILL BE CONSISTENT WITH THE GUIDELINES OF NUREG-0731; "GUIDELINES FOR UTILITY MANAGEMENT STRUCTURE AND TECHNICAL RESOURCES"
- PUGET WILL EMPLOY THE OPERATING STAFF WITH AMPLE LEAD TIME TO LEARN S/HNP DESIGN AND OPERATION AND BE DIRECTLY INVOLVED IN THE PREOPERATIONAL AND STARTUP TEST PROGRAMS

SKAGIT/HANFORD NUCLEAR PROJECT

DESIGN CONSIDERATIONS

DENNIS B. HACKING
PROJECT ENGINEER
NORTHWEST ENERGY SERVICES COMPANY

77

SKAGIT/HANFORD NUCLEAR PROJECT

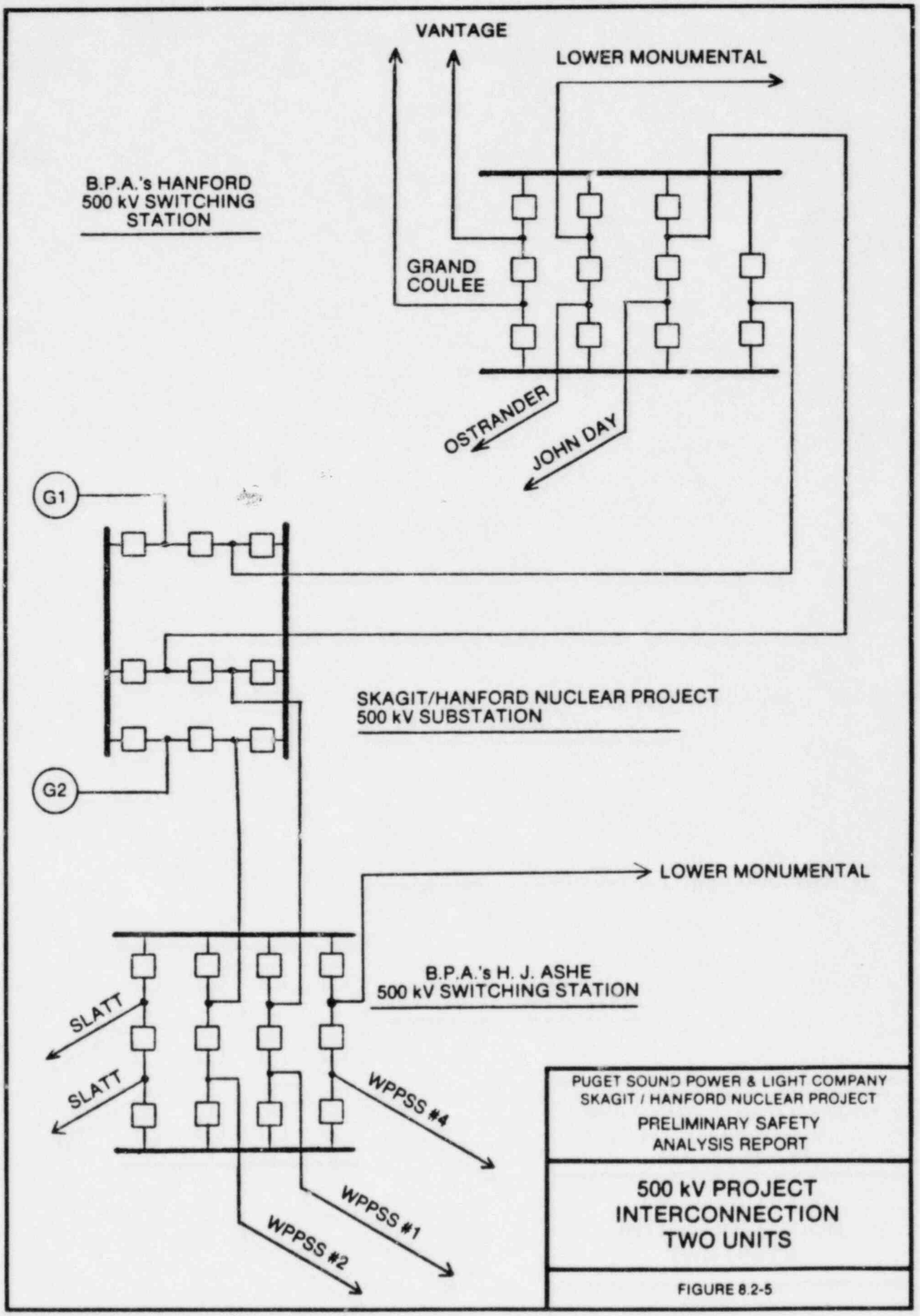
UNIQUE CRITERIA FOR S/HNP SITE

- METEOROLOGY
- SOILS/SITE CHARACTERISTICS
- RAW WATER SUPPLY
- PLANT LIQUID DISCHARGE
- ELECTRICAL TRANSMISSION INTERFACE

SKAGIT/HANFORD NUCLEAR PROJECT

SITE-RELATED DESIGN CHANGES

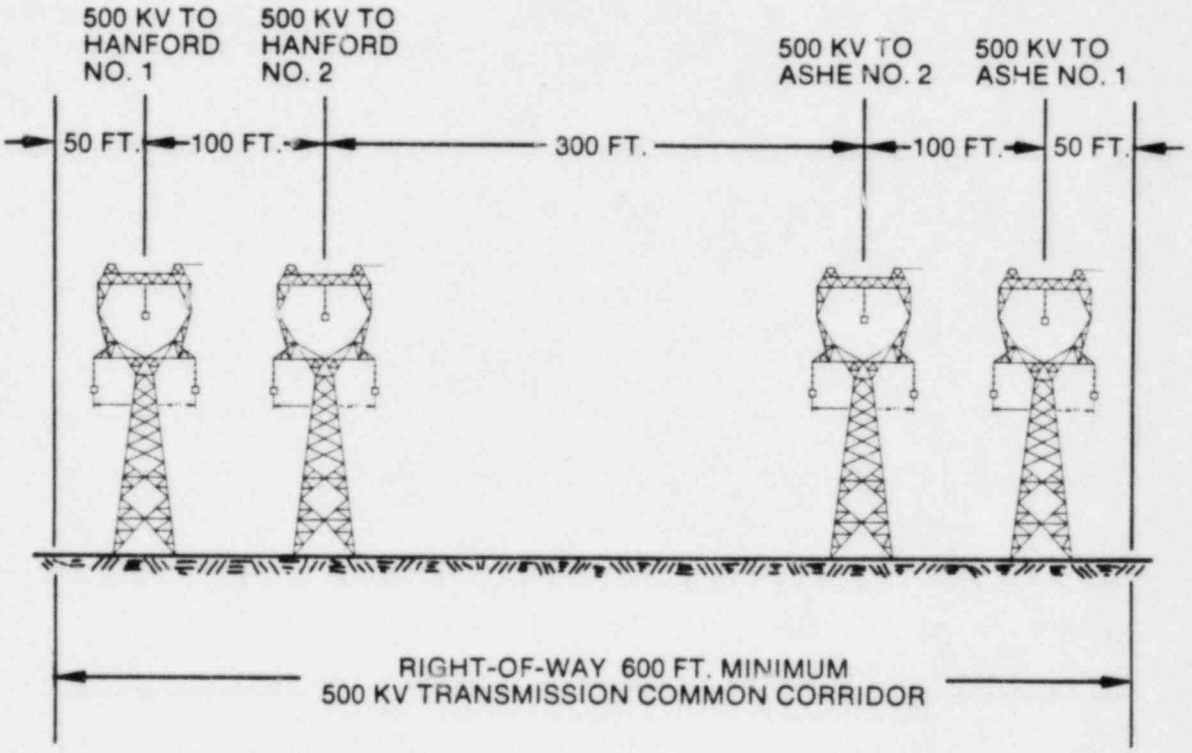
- COOLING TOWERS
- HVAC
- FOUNDATION DESIGN
- ULTIMATE HEAT SINK DIMENSIONS
- RAW WATER SUPPLY
- PLANT LIQUID DISCHARGES
  - IN-RIVER DISCHARGE DESIGN
  - LIQUID RADWASTE RELEASE
  - SANITARY WASTES
- ELECTRICAL
  - PLANT LOAD
  - TRANSMISSION INTERFACE
- SITE ACCESS ROADS AND RAILROADS


VANTAGE
LOWER MONUMENTAL
B.P.A.'s HANFORD
500 kV SWITCHING
STATION
GRAND
COULEE
OSTRANDER
JOHN DAY
G1
G2
SKAGIT/HANFORD NUCLEAR PROJECT
500 kV SUBSTATION
LOWER MONUMENTAL
B.P.A.'s H. J. ASHE
500 kV SWITCHING STATION
SLATT
SLATT
WPPSS #4
WPPSS #1
WPPSS #2
PUGET SOUND POWER & LIGHT COMPANY
SKAGIT / HANFORD NUCLEAR PROJECT
PRELIMINARY SAFETY
ANALYSIS REPORT
500 kV PROJECT
INTERCONNECTION
TWO UNITS
FIGURE 8.2-5

SKAGIT/HANFORD NUCLEAR PROJECT

FUTURE DESIGN CONSIDERATIONS

- FEEDBACK OF INDUSTRY EXPERIENCE
- EVOLVING REGULATORY REQUIREMENTS
- PROBABILISTIC RISK ASSESSMENT (PRA)

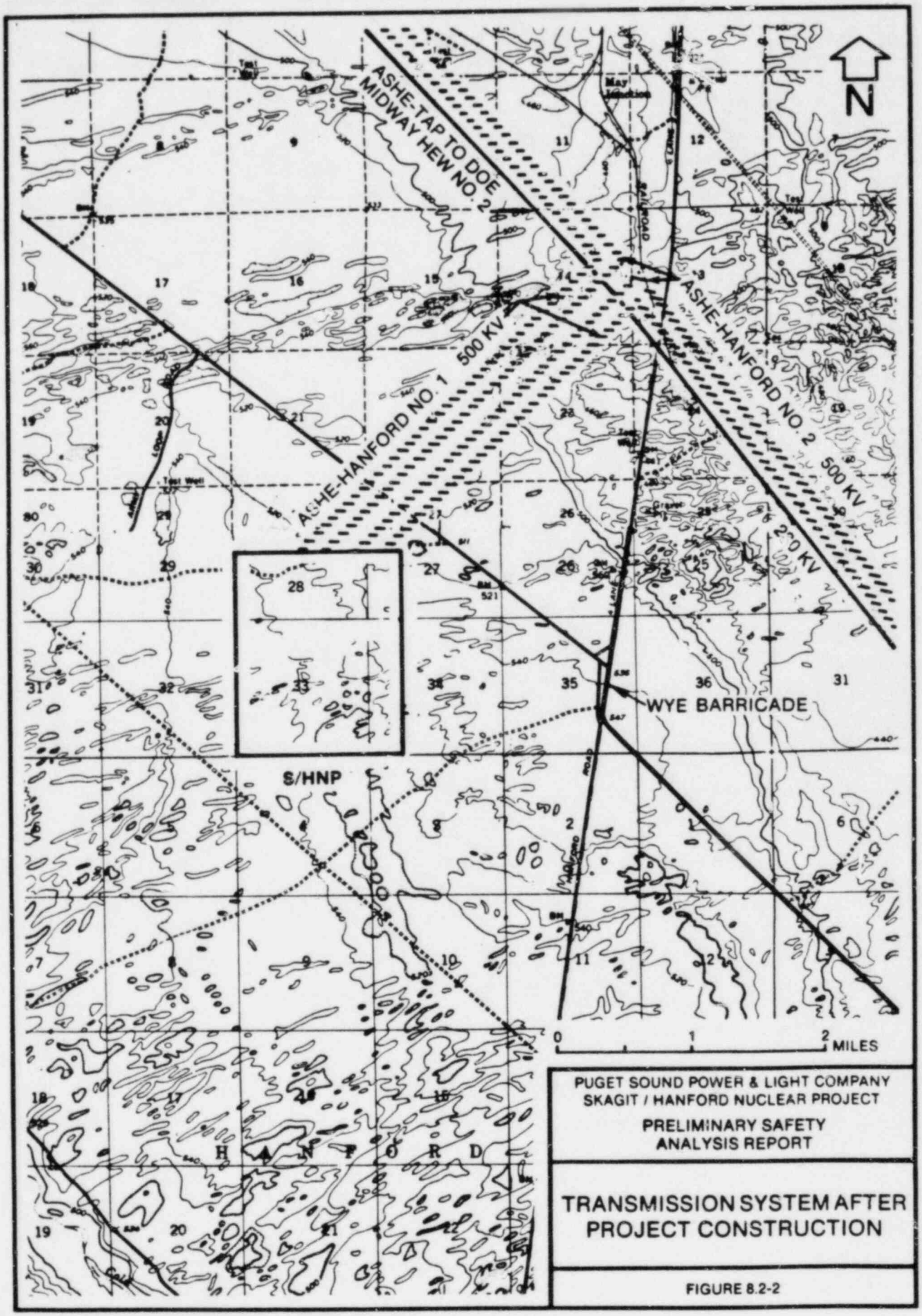


PUGET SOUND POWER & LIGHT COMPANY
SKAGIT / HANFORD NUCLEAR PROJECT
ENVIRONMENTAL REPORT

**500 KV LINES
TYPICAL CROSS-SECTION
PROJECT RIGHT-OF-WAY**

FIGURE 8.2-3

T7



PUGET SOUND POWER & LIGHT COMPANY
SKAGIT / HANFORD NUCLEAR PROJECT

PRELIMINARY SAFETY ANALYSIS REPORT

TRANSMISSION SYSTEM AFTER PROJECT CONSTRUCTION

FIGURE 8.2-2

T7