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MAR 17 1983

MEMORANDUM FOR: Gus C. Lainas, Assistant Director
for Operating Reactors, DL

FROM: Daniel R. Muller, Assistant Director
for Radiation Protection, DSI

SUBJECT: (TAC NO. 49636) USGS/FEMA REPORT ON HYPOTHETICAL FAILURE OF SPIRIT LAKE BLOCKAGE

J. Levine of the Meteorology Section, Meteorology and Effluent Treatment Branch, reviewed the USGS/FEMA report, "Water Resources Investigation Report 82-4125."

Although the meteorological assumptions are not explicitly defined, the analysis of the impact of the natural dam failure was based on normal precipitation and the 100 year inflow into the Spirit Lake drainage basin. The effect of greater than normal precipitation, changes in the inflow rates to the Lake as a result of severe winter storms, and changed topographic features due to the Mt. St. Helens eruptions, have not been considered. However, because of the small drainage area feeding Spirit Lake, it appears that such considerations would have little effect on either the probability of failure or the severity of its consequences. For example, the runoff from a probable maximum precipitation event would be insignificant relative to seasonal variation in runoff.

Original signed by
Daniel R. Muller

Daniel R. Muller, Assistant Director
for Radiation Protection
Division of Systems Integration

cc: R. Mattson
W. Gammill
J. Stolz
R. Clark
C. Trammell
M. Fliegel
R. Gonzalez
I. Spickler
J. Levine

*SEE PREVIOUS WHITE FOR CONCURRENCES.

A/D

OFFICE	DSI:RP:METB	DSI:RP:METB	DSI:RP:METB	DSI:RP		
SURNAME	JRLevine:dj	ISpickler	WPGammill	DRMuller	8508080325 850618 PDR FOIA BELL85-353 PDR	
DATE	03/11/83*	03/11/83*	03/14/83*	03/17/83		

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981-335-960

R Gonzales

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 17, 1984

MEMORANDUM FOR: James R. Miller, Chief
Operating Reactors Branch #3, DL

FROM: Charles M. Trammell, Project Manager
Operating Reactors Branch #3, DL

SUBJECT: FORTHCOMING MEETING WITH
PORTLAND GENERAL ELECTRIC
TROJAN NUCLEAR PLANT
SPIRIT LAKE BLOCKAGE

Date and Time: Thursday, February 23, 1984
9:15 A.m.

Location: Phillips Building
Room P-422

Purpose: To discuss licensee's and consultant's analyses of the flood potential at Trojan of a breakout of Spirit Lake on Mount St. Helens. See attached agenda.

Participants:

NRC

W. Johnston
R. Ballard
M. Fliegel
R. Gonzales
G. Lainas
J. Miller
C. Trammell

USGS

Chuck Swift
Les Laird

PGE

G. Zimmerman
T. Bushnell

Simons, Li & Associates

Dr. Li

Charles M. Trammell, Project Manager
Operating Reactors Branch #3, DL

Attachment:
Agenda

8402280622 PDR

8pp

MEETING NOTICE DISTRIBUTION

cc: Docket File
NRC PDR
Local PDR
NSIC
ORB#3 Rdg
G. C. Lainas
G. Holahan, ORAB
H. Denton
B. Grimes
Project Manager
OELD
I&E
Receptionist
ACRS-10
Resident Inspector
Regional Administrator
M. Schaaf
NRC Participants
Licensee

February 14, 1984

Preliminary Agenda for Meeting

Trojan - Spirit Lake - Mount St. Helens

February 23, 1984

I. USGS Presentation

1. USGS Report 82-4125 "Mudflow Hazards Along the Toutle and Cowlitz Rivers from a Hypothetical Failure of Spirit Lake Blockage", as it relates to study done for NRC

2. Study done for NRC

   a) Bases for assumptions

      1) which assumptions are reasonable

      2) which assumptions are conservative

   b) Conclusions regarding potential impacts on Trojan

3. Status of USGS's long term FEMA study for the Columbia River.

II. PGE Presentation

1. Simons, Li Report

III. Group Discussion

1. USGS views on Simons, Li Report & NRC's comments on the Simons, Li Report

2. Discussion between NRC, PGE and consultant, and USGS on differences between PGE's Simons, Li Report and USGS's NRC report

3. Need for further analyses and evaluations

NRC - PG&E - SLA meeting on Trojan - Mount St Helens
Feb 23, 1984

Attendance

SPIRIT LAKE MTG

Name	Affiliation
Charles Trammell	NRC
Myron Fliegel	NRC
Leslie Laird	USGS
Gary A. Zimmerman	PGE
Theodore E. Bushman	PGE
Ruh-Ming Li	Simons, Li & Associates, Inc
Michael Donenica	Simons, Li & Asso. Bethesda
Ray Gonzales	NRC
Ed Pentegost	NRC
Ron Ballard	NRC
Bill Sikonia	USGS
Chuck Swift	USGS
Jim Miller	NRC

UPDATE 1:30 pm Feb 15, 1984

TROJAN - SPIRIT LAKE - MOUNT ST HELENS

"NOTE TO J. MILLER

The Corps of Engineers resumed pumping from Spirit Lake last Saturday February 11th. The crew manning the pumps had been evacuated on February 5th, so there was no pumping for about a week. During this time, the lake level rose about 0.3 ft. to elevation 3461.0. This level is 14 feet lower than the level considered safe by the Corps.

Latest forcast from the National Weather Service is that the flow in the Columbia River is not expected to increase through tomorrow - Thursday Feb 16.

LAR 2-5117

copies sent to 1) Ballard 2) Fliegel 3) Trammell

MAR 14 1984

RECORD OF TELEPHONE CONVERSATION

DATE: MARCH 14, 1984 PROJECT: TROJAN/COLUMBIA RIVER

RECORDED BY: Raymond Gonzales

TALKED WITH: Chuck Swift OF USGS, Tacoma, Wash.

MAIN SUBJECT OF CALL: At the Feb. 23, 1984 meeting with USGS, PG&E and consultants, USGS had promised to send NRC copies of the view-graphs that they showed on Feb 23. C. Trammell had called Ron Ballard to check on the status of the viewgraphs and also the USGS letter report on the Feb 23rd meeting. Ron asked HES to find out when we can expect this information.

I called Chuck Swift at 2:15 pm on March 14. He informed me that the view-graphs are ready to be sent out to us but there had been some delay in typing. He expects these to be in the mail this week. He also informed me that the letter report is ready for Mr. Laird's signature but would not speculate as to when Mr. Laird would sent it out.

I also asked him about the May 1 date for their submittal of an engineering report to FEMA concerning the study being done. He said that if the May 1st date is to be met, the whole Tuttle River will not be modeled because the sediment date won't be available by May 1st. (At the Feb 23 meeting there had been some misunderstanding between Mr. Laird and Mr. Sjoreia, who is developing the model; as to what will be in the May 1 report.) Mr Swift said that the letter report will discuss this.

I also told Mr. Swift that we received their proposal for attending the Feb 23 meeting and furnishing a letter report, on March 9. I explained that paperwork on their proposal is underway at NRC and the contract should go out to USGS in a week or so.

Ray

cc:
Fliegel
Ballard
Trammell
Miller

May 3, 1984

I called Bill Sikonia of the USGS - Tacoma, Wash., to find out ~~if~~ when the Columbia River / Mt St Helens report which was scheduled to be completed this month, will be completed. Bill told me that his ~~son~~ report is complete and is now being reviewed. The report should be available before the end of May and he will send NRC a copy.

Lay 2811 7

RECORD OF TELEPHONE CONVERSATION

DATE: May 8, 1984 - 11:35 a.m. PROJECT: Trojan / Mt. St. Helens

RECORDED BY: Raymond Gonzales

TALKED WITH: Bill Sikonia OF the USGS-Tacoma, Wash.
FTS 8-390-6510

MAIN SUBJECT OF CALL: To ask if the USGS-FEMA report, on the effects of a failure of Spirit Lake (due this month), shows significant differences from the USGS study done for NRC.

I told Mr. Sikonia that we were in the process of proposing some new operating procedures for Trojan to address the potential breakout of Spirit Lake and had decided to use the study they did for us as a basis instead of the applicant's Simon & Li report. However, I told him that if the results of his new report show significant differences, we may want to hold up on our decision until we see their new report.

Mr. Sikonia did not want to give me any numbers because the report is now being reviewed by his management. All he would say is that we may want to wait until we get their report because there have been some changes in the assumptions. I asked him if the flow discharge into the Columbia River had changed but he did not want to release such information prematurely.

He said that their report will hopefully be out by the end of this month.

Ray

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUL 25 1983

Docket No. 50-344

Mr. Bart D. Withers
Vice President Nuclear
Portland General Electric Company
121 S. W. Salmon Street
Portland, Oregon 97204

Dear Mr. Withers:

In conducting our review of your letter of July 1, 1983 relating to Spirit Lake, we have determined that we will need the additional information identified in the enclosure to continue our review.

In order for us to maintain our review schedule, your response is requested within 30 days of your receipt of this letter.

Following receipt of your response, we request that a meeting be held in Bethesda with you and your consultant to discuss this matter in more detail. We plan to also have our consultant (USGS) attend. For planning purposes, the meeting should be held about two weeks after we receive your response. Please contact your NRC Project Manager who can make detailed arrangements.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Please contact us if you have any questions concerning this request.

Sincerely,

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosure: Request for
Additional Information

cc w/enclosure:
See next page

8308050015 ADR
4PP

A/32

cc: Michael Malmros, Resident Inspector
U. S. Nuclear Regulatory Commission
Trojan Nuclear Plant
P. O. Box O
Rainier, Oregon 97048

Robert M. Hunt, Chairman
Board of County Commissioners
Columbia County
St. Helens, Oregon 97501

Donald W. Godard, Supervisor
Siting and Regulation
Oregon Department of Energy
Labor and Industries Building
Room 111
Salem, Oregon 97310

Regional Administrator
Nuclear Regulatory Commission, Region V
Office of Executive Director for Operations
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

HYDROLOGIC ENGINEERING SECTION

Additional Questions "Potential Mudflow from a Hypothetical Failure of Spirit Lake Blockage" (July 1, 1983 response from PGE)

1. The report appears to be a summary of a more detailed analysis and report. As such, however, it does not contain the information necessary to enable us to evaluate it. If you have a more complete report please provide it.

2. The important case of a mudflow during a low Columbia River flowrate, with consequent high sedimentation in the Columbia River, followed by a large flowrate has been neglected. Records have shown that high flowrates (1,000,000 CFS) have followed periods of low flow by only a few days. Analyse the potential for flooding of the site by this scenario, or justify why this case was not considered.

3. Item 1.3 The procedure used to reduce the sediment concentrations from 39, 52, and 65 percent to 20, 30, and 45 percent respectively, as summarized in Table 1 should be discussed and all assumptions should be justified. For example, what is the basis for reducing the volume of material into the Cowlitz by 40% (column 2)? What is the basis for the ratio of sand to finer material of 2 to 1 (columns 3 and 4)? Etc.

4. Item 1.4 Please explain the basis for the 30 percent moisture assumption. Is this figure based on available pore volume or on total volume of dry solid? What porosity was used and what is its basis?

5. Item 1.6 What is the basis for assuming a Columbia River sediment concentration of 500 ppm? What effect would varying this concentration have on your results?

6. Several references are used in the text, but are not documented. For example, the "Colby method" in item 2.4. Provide the references.

7. Item 2.5 Define the term "bulking factor".

8. Item 2.6 Give basis for your assumption that the shape of the mudflow sediment deposit at the confluence of the Cowlitz and Columbia rivers can be ratioed from the configuration of the deposition following the May 18, 1980 mudflow. That mudflow deposition was rather flat compared to other known mudflow slopes. What is the sensitivity of your results to variations in the slope of deposited sediments?

9. Item 3.4 Give basis for calculations of sediment load. Were formulas employed derived from relationships for sediment transport in rivers? If so, justify that these formulas are acceptable for the very-high sediment loads of the present case.

10. Item 3.8 Why is 400,000 CFS the "most reasonable Columbia River flow to evaluate"? Is there a probabilistic basis for this conclusion?

11. Table 1

(a) Column 8 is unclear. Arithmetically, it appears that the expression should be (col 6 + col 4)/1.4. Explain the meaning of the value 1.4, and why it is used here.

(b) - Explain the difference between column 1 and 2. Also, why is "material" used in column 1 and "sand, silt and clay" used in column 2?

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 27 1983

A Gonzales

Docket No. 50-344

Mr. Bart D. Withers
Vice President Nuclear
Portland General Electric Company
121 S.W. Salmon Street
Portland, Oregon 97204

Dear Mr. Withers:

In conducting our review of your letter of April 12, 1983 relating to potential mudflows from a postulated failure of the Spirit Lake blockage, we have determined that we will need the additional information identified in the enclosure to continue our review. As you are aware, we are also presently discussing this matter with the United States Geological Survey.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Please respond to this request within 30 days of your receipt of this letter. We intend to review your response and complete our independent review of this matter in order to ensure that a breakout of the Spirit Lake blockage would create no safety problem before plant operation is resumed in July.

Please contact us if you have any questions concerning this request.

Sincerely,

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosure: Request for
Additional Information

cc w/enclosure:
See next page

~~8306080332 PDR~~

3pp

Portland General Electric Company

cc: Michael Malmros, Resident Inspector
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REQUEST FOR ADDITIONAL INFORMATION

In referring to USGS Report 82-4125, you state that the Trojan Plant is protected against conditions that might be expected from a failure of the Spirit Lake debris blockage. You apparently base this statement on the fact that the design basis flood for Trojan, 4,400,000 cfs, is substantially more than the 1,090,000 cfs postulated by the USGS in their report. We would agree with this reasoning if the Spirit Lake breakout flood was a clear-water flood. However, since it would be a mudflow, the forces considered in analyzing fluid flow, particularly pressure, inertia and viscosity would be significantly different. We would expect that the more viscous mudflow would result in reduced channel efficiency and higher flood levels for a given flow. In addition, the mudflow would be capable of depositing a tremendous amount of sediment in the Columbia River thus resulting in even higher flood levels.

The staff position is that you have not provided sufficient information to show that a breakout of Spirit Lake and the ensuing mudflow would not affect the safety of the Trojan Plant. You should therefore provide the following information for staff review.

1. Taking the scenario in the USGS report as a "given", discuss the likelihood of water levels exceeding plant grade elevation of 45 feet msl at Trojan.

2. Discuss the effect of water levels higher than elevation 45 feet msl on the safety of the Trojan Plant assuming various durations and levels of flooding.