Fiorelli

THE CINCINNATI GAS & ELECTRIC COMPANY

CINCINNATI, OHIO 45201

E. A. BORGMANN
VICE PRESIDENT

Note: Traveler attached.

August 21, 1980
QA-1332

U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Attention: Mr. Gaston Fiorelli, Chief
Reactor Construction and
Engineering Support Branch

RE: WM. H. ZIMMER NUCLEAR POWER STATION UNIT I
NRC INSPECTION REPORT NO. 80-15, DOCKET NO. 50-358, CONSTRUCTION PERMIT NO. CPPR-88, W.O. #57300-957, JOB E-5590

Gentlemen:

This letter constitutes our formal reply to the subject inspection report. It is our opinion that nothing in the report or in this reply is of a proprietary nature.

Our response to the item of noncompliance cited in Appendix "A" of the report is as follows:

1. Corrective Action Taken and Results Achieved

   Henry J. Kaiser Company has issued a revision to Field Construction Procedure 2.6 covering Design Document Changes. This revision incorporates additional requirements for field monitoring and verification of DDC work by Field Engineers in the electrical, mechanical, and structural disciplines.

   Henry J. Kaiser Company Quality Assurance will issue a procedure establishing a method whereby QA inspectors will verify and document the implementation and acceptance of field activities identified on Design Document Changes.

2. Corrective Action To Be Taken To Avoid Further Noncompliance

   The new Field Construction Procedure outlined above will assure that the status of DDC work in progress is monitored and that Construction Engineering verifies completeness and correctness of installation before

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releasing the work for QA inspection.

The new QA procedure outlined above will be implemented with appropriate QA personnel trained to the new procedure.

3. Date When Full Compliance Will Be Achieved

Full compliance will be achieved by September 30, 1980.

We trust that the above will constitute an acceptable response to the subject inspection report.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By [signature]

E. A. BORGMANN
SENIOR VICE PRESIDENT

JFW:ec

References for Part A, Landslides

1. Bretz, J. H., 1969, The Lake Missoula floods and the Channeled Scabland: Jour. Geology, V. 77, No. 5, p. 505-543.

2. Palmer, L., 1977, Large Landslides of the Columbia River Gorge, Oregon and Washington, Geological Society of America, Reviews in Engineering Geology, Volume III, pp. 69-83.

3. Peterson, R. A., J. E. White & R. K. Dodds, 1972, Geophysical Survey Report Trojan Nuclear Power Plant Site; Prepared by the Trojan Geophysical Advisory Board for the U. S. Atomic Energy Commission, August, 1972.

4. Piteau, D. R., 1977 Regional Slope - stability Controls and Engineering Geology of the Frazer Canyon, British Columbia; Geological Society of America Reviews in Engineering Geology, Volume III 1977.

5. Portland General Electric Company, 1973, Final Safety Analysis Report, Volume 1.

6. Portland General Electric Company, 1969, Preliminary Safety Analysis Report, Trojan Nuclear Plant, Volume 1.

7. State of Oregon Department of Geology and Mineral Industries, 1978, Geologic Hazards Review Trojan Nuclear Power Plant Site Columbia County, Oregon, Open File Report 78- , March 14, 1978.

8. U. S. Atomic Energy Commission, 1974, Safety Evaluation Report Trojan Nuclear Plant, Docket No. 50-344, October 7, 1974.

9. U. S. Atomic Energy Commission, 1970, Safety Evaluation Report by the Division of Reactor Licensing, US AEC, In the Matter of Portland General Electric Company, City of Eugene, Oregon, Pacific Power and Light Co., Trojan Nuclear Plant, Docket No. 50-344, October 19, 1970.

B. Volcanism

1 Staff Position After CP and OL Reviews and Current NRC Position

In its Safety Evaluation Report dated October 14, 1970, following the Construction Permit review, the staff concluded that: "The applicant has evaluated potential lava flows, mud flows, and volcanic ash falls and determined that they would not adversely affect the safe operation of the Trojan reactor. We and our consultants, USGS, have reviewed the applicant's evaluations. We conclude that the assumptions and evaluation techniques used by the applicant were reasonable and we agree with the applicant's conclusion."

In the Safety Evaluation Report (October 7, 1974), after reviewing the Final Safety Analysis Report, in support of the application for an operating license, the staff concluded that: "based on this review, we conclude that investigations conducted since the issuance of our Safety Evaluation Report dated October 19, 1970, have disclosed nothing that would alter our original conclusion regarding the suitability of the Trojan Plant Site." Since publication of the SER, new information has become available. We have reviewed these data and we see no reason to change our original conclusion.

2. Basis for the Staff's Conclusions Following the CP and OL Review

During the review for the Trojan site the following potential volcanic hazards were evaluated as to their significance to the Trojan site: ashfall, mudflows, pyroclastic flow, flooding, and lava. Crandell and

Waldron (1969) indicate that if one of the Cascade volcanoes erupts, "we believe that ash eruptions and mudflows are the two greatest hazards."

a. Volcanic Ash. Ash is made up of fine volcanic particles that have been blown high into the air by explosions in a volcano. The extent and thickness of ash fallout is influenced by the altitude to which it has been erupted, sizes of the particles, the directions and velocities of the winds, and other meteorologic conditions. Mount St. Helens is the closest (33 miles east northeast) and most likely source of ash that could affect the site. The applicant stated in the PSAR that even if the ash fall from the Crater Lake eruption were superimposed over Mount St. Helens, the resulting ash fall would not have damaged the plant, nor caused interruption of the cooling water supply. Crater Lake is located in the Cascade Mountains in southern Oregon and was formed by violent eruptions of a volcano (Mt. Mazama) about 7000 years B.C. The staff agreed with that conclusion on the bases that : (1) the site lies near the maximum extent of ashfall when the contours showing the distribution of ash from the Mt. Mazama eruptions according to Williams (1942) are superimposed on Mount St. Helens and other nearby volcanoes (PSAR Figure 2.8-16); (2) the prevailing winds blow away from the plant toward the volcano most of the time and apparently have done so for thousands of years; and (3) the source of emergency cooling water is the Columbia River.

b. Mudflows. "Mudflows are masses of water saturated rock debris which move downslope in a manner resembling the flow e of wet concrete." (Crandell, 1976). Mudflows have been known to move many tens of kilometers down valley floors at speeds of 35 km/hr or more (Crandell, 1976). The possibility of a mudflow from Mount St. Helens endangering the site was considered during the CP stage. The applicant concluded that, "A large mudflow on Mount St. Helens would likely move either down the Kalama River Valley or the Lewis River Valley. The mouth of the Kalama River is close to the Trojan site, but on the opposite side of the Columbia River. It does not seem credible that a debris flow down the Kalama would even reach the Columbia River, let alone that it could block it. If it reached the Columbia River, its probable worst effect would be to muddy the river downstream as the Columbia removed and diluted the flow of debris emptying into it. The slopes are so flat at the point where the Kalama discharges into the Columbia that a mudflow extending that far would be moving very slowly." The staff also concluded that mudflows did not constitute a hazard to the plant.

c. Floods. Floods can be caused by melting of snow on the flanks of a volcano. These floodwaters can carry large amounts of rock debris which can be deposited many kilometers from the volcano. An analysis of the flooding potential due to volcano eruption was made by PGE during the CP stage of the licensing process. The worst case situation was failure of dams and reservoirs along the Lewis River. It was concluded that flooding from the Lewis River reservoirs would not raise the Columbia River enough to inundate the plant.

A similar analysis was not done by the staff; however, the staff's hydrological engineering analysis showed that the plant was safe from flooding even assuming the failure of upstream dams including Grand Coulee Dam. Any flooding caused by volcanic activity would be less severe than the failure of upstream dams on the Columbia River.

d. Pyroclastic flow. As defined by Crandell (1976), pyroclastic flow is a mass of hot, dry rock debris that moves rapidly down the flanks of volcanoes. Because of the distance that Trojan lies from the nearest volcano, and the topography, pyroclastic flow was not regarded as a hazard to the site.

e. Lava Flows. According to Crandell (1976) lava flows generally erupt quitely, but can be proceeded by explosive activity. Lava flows are usually confined to the immediate slopes and toe of the volcano. In order for lava to reach the site it must be highly fluid and of great volume. This is not characteristic of Mount St. Helens and there is no evidence that lava from this volcano reached the

Columbia River. For these reasons lava flows were considered not to present a hazard to the Trojan site.

3. Variation of Volcanic Activity in the Pacific Northwest

The staff finds no evidence indicating that there has been a recent increase in activity of Cascade volcanoes. Evidence is that future activity will continue much as it has in the past 10,000 years. The volcanoes nearest to the Trojan site: Mt. St. Helens, Mt. Rainier, and Mt. Hood are considered active volcanoes. The available evidence indicates that activity has been essentially constant though episodic for at least the last 10,000 years. Historic data show that Mount St. Helens was substantially more active during the 19th Century than during the 20th Century. The enclosed figure is a compilation of known activity of several Cascade volcanoes including those most significant to the Trojan site. The illustration is based on data published by several investigators, which was presented in Portland General Electric's report entitled "Volcanic Hazard Study, Potential for Volcanic Ash Fall, Pebble Springs Nuclear Site, Gilliam County, Oregon." It can be seen from this illustration that Mt. Rainier and Mt. Hood have undergone sporadic activity for at least the last 10,000 years and Mount St. Helens for 4,000 years. This type of activity is expected to continue in the future.

Worldwide data on plate tectonic activity support this interpretation. The volcanic activity is related to processes at the plate boundary in this region. Data indicate that plate tectonic activity in the United States Pacific Northwest is either continuing at a relatively slow rate as compared to most tectonically active regions around the world, or has stopped completely. This would explain the relative inactivity of the Cascade volcanoes, when compared to world wide data. For example, in the vicinity of the Aleutian Trench, where the Pacific Plate is actively subducting beneath the Alaskan Plate, volcanoes have erupted far more frequently historically and with greater violence than in the U. S. Pacific Northwest.

It is not possible to absolutely rule out that Mt. Hood, Mt. Rainier, or Mt. St. Helens could experience similar eruptions like those that formed Crater Lake. Crater Lake was created after violent eruptions of Mt. Mazama about 7000 years B.C. However, such an occurrence is considered to be very unlikely within the next few centuries (Crandell and Mullineaux, 1975). It would represent a complete change in activity from that demonstrated during the last 10,000 years for Mt. Hood and Mt. Rainier and 4000 years for Mount St. Helens. Such an eruption at one of these volcanoes occurring simultaneously with the wind blowing toward the site is extremely remote. Therefore it is reasonable to assume that the worst events that have occurred in the geologic past at a specific volcano could occur there again.

It is the staff's position that any increase in volcanic activity that is postulated, based on a study of the activity of the Cascade volcanoes for the past 10,000 years is not likely to present a hazard to the Trojan site. We believe that there will be no increase in activity based on the experience of the past 10,000 years. Evidence from the plate tectonic theory supports this position.

4. Data Subsequent to the SER's

Considerable additional studies have been made of the volcanic hazards of the Pacific Northwest since publication of the Safety Evaluation Reports. Many of these studies have been conducted in regard to the siting of nuclear power plants, such as the Washington Public Power Supply System (WPPSS) Nuclear Project 3 and 5, the Puget Power Skagit site, and the Portland General Electric Pebble Springs site. The data included in the reports supporting license applications for these sites are compilations of data from many investigators. The USGS has published studies of volcanoes in the Pacific Northwest, among which are volcanic hazard assessment maps (Crandell, 1976 and Mullineaux, 1976).

The analysis of volcanic hazard for the WPPSS 3 and 5 site, which is 80 miles from the nearest volcano (Mt. Rainier and Mount St. Helens) indicated that only ash could affect the site. It further showed that less than 2 inches of ash would fall at the site even if the assumption is made that a Mt. Mazama type eruption occurred at Mt. Rainier or Mount St. Helens.

Based on a recommendation from the USGS, Puget Power postulated that a mudflow similar to the Osceola mudflow from Mt. Rainier could occur at Mt. Baker, which is about 22 miles east of the Skagit site. The analysis showed that such a mudflow would not adversely affect the site. Ashfall is believed to be the only form of eruption that poses a direct hazard to the Skagit site (USGS, 1977). The Skagit site is located about 56 miles from Glacier Peak, the nearest volcano with an explosive history. Based on the superposition of the 1912 Katmai Alaska eruption on Glacier Peak, about 2 inches of ash would fall at the site. The Applicant assumed a maximum ash accumulation of 6". The staff and the USGS concluded that this was a conservative approach.

Unlike the WPPSS 3 and 5, Skagit and Trojan sites, the Pebble Springs site is located east and downwind of the Cascade volcanoes. During the review of the volcanic hazard for the Pebble Springs site, it was our position, and that of the U. S. Geological Survey, that a conservative and reasonable estimate of a maximum potential ash fall at the site should be modeled after the Yn ash layer which was erupted from Mt. St. Helens between 3,000 and 4,000 B.C. This analysis resulted in the assumption of a thickness of 8 1/2 inches of uncompacted ash at the site, which is located 80 miles and 105 miles east of Mt. Hood and Mount St. Helens respectively. Since publication of the SER's the USGS has published 2 Volcanic Hazards Maps (Crandell, 1976 and Mullineaux, 1977). The former designates zones in the state of Washington within which specific volcanic hazards are possible. The latter shows volcanic hazard zones in the western United States. The USGS also open filed a report entitled Potential Hazards from Future Eruptions of Mount St. Helens Volcano, Washington (Crandell and Mullineaux, 1976).

5. Impact of Subsequent Data on Original Conclusions

Based on the data that the staff is aware of, which has come to light since the CP & OL proceedings, the only form of volcanic eruption that could directly affect the Trojan site is ash fall. However, new information has become available regarding several of the other potential hazards. These will be addressed first, followed by a discussion of ashfall.

Crandell (1976) and Figure 2.5.18 of the WPPSS Nuclear Project No. 3 Preliminary Safety Analysis Report, which is based on data presented by Crandell (1973), shows mud flow deposits just north of Longview, Washington in the Cowlitz River Valley. During its evaluation of this phenomenon PGE concluded that because of the distance from the volcano, and consideration that the intersection of the Cowlitz and Columbia Rivers was located downstream from the plant there was no potential hazard to the Trojan plant. Crandell (1976) also shows a potential mudflow hazard within the Kalama River Valley extending to about 8 miles from its intersection with the Columbia River. This does not present a threat to the Trojan site. Much larger mudflows have occurred in the region such as the Osceola mudflow from Mt. Rainier, which was used as a model for the maximum possible mudflow during the Skagit site review. However, since Mount St. Helens is a relatively young and unaltered volcano, one would not expect such large quantities of potential mudflow material to be available on its flanks as on those of the older altered volcanoes like Mt. Rainier and Mt. Baker. According to Crandell and Mullineaux (1976), "The absence of an appreciable amount of clay in mudflows from Mount St. Helens suggests that large areas of hydrothermally altered rock did not exist on the volcano in the past; nor are they present today. For this reason, mudflows as large as the largest from Mount Rainier volcano (Crandell, 1971) are not likely to occur in the foreseeable future at Mount St. Helens." Because of the distance from the Trojan site to the volcano, the nature of the intervening topography, the site being outside of the mudflow hazard zone specified by Crandell (1976), and the youthfulness of Mount St. Helens, we consider our earlier conclusion that mudflows do not constitute a threat to the Trojan site, as being still valid.

Crandell (1976) shows the potential for volcano induced flooding at the Kalama and Lewis Rivers. As stated earlier, flooding from these sources would be less than the assumption of failure of upstream dams on the Columbia River. The site is considered to be safe from such events.

The distribution and thickness of ash deposits east of the Cascade volcanoes are relatively well documented, at least those that originated within the last 10,000 years. The distribution of ash to the west of the volcanoes is not well documented, partly because the prevailing winds blow mostly toward the east, therefore, most ash has been transported in that direction; and partly because investigations have not been conducted west of the volcanoes to the extent that they have to the east. According to Crandell (1976) "No significant amount of tephra has fallen in the western sector beyond the base of the source volcano during the last 4,000 years at Mt. St. Helens, or during the last 10,000 years at the other large volcanoes in Washington." Crandell (1976) and Mullineaux (1976) selected the respective tephra hazard zones west of each volcano to be 25% as great as those in the eastern sector, although the few ash beds known to exist west of their source vents are less than 10% of the distance that similar beds extend east of the source vents (Mullineaux 1976). This number is not completely arbitrary as it is based on the knowledge that not only do the prevailing winds blow to the east most of the time, but on the rare occasions when they are blowing to the west, velocities are significantly less. This is demonstrated by attached tables 3 and 4 from Crandell and Mullineaux (1976).

The Trojan site is near the outer boundary designated as zone B by Mullineaux (1976), and described as an area subject to 5 cms or more of ash from a "large" eruption similar to the Mount St. Helens eruption about 3,400 years ago. The site is located in an area designated by Crandell (1976) as one of very low to low potential hazard to known human life and health, and one of probable maximum tephra thickness of less than 5 cms. With regard to the spent fuel building, the weight of 5 cm of uncompacted ash on the fuel building roof would impose loads well within the design limits of the roof. (FSAR Table 3.8-2 gives live load design limits for facility roofs.)

The staff concludes that information that has become available since publication of the SER's does not cause us to alter our original conclusions that the site is suitable from a volcanic hazards standpoint including the spent fuel pool.

6. Conclusions

a. It is the staff's position that there is no present increase in volcanic activity in the Cascade volcanoes. Available evidence indicates that activity has been relatively consistent over the past 10,000 years. The historic record shows that Mount St. Helens was far more active during the 19th Century than during the 20th Century. Future activity is expected to be similar to that which has occurred during the past 10,000 years. A very large eruption, like the Crater Lake eruptions, of one of the larger Cascade volcanoes cannot be completely ruled out. However, such an occurrence simultaneous with high altitude winds blowing toward the site is considered to be extremely remote. Any increase in volcanic activity that is postulated, based on the activity of the Cascade volcanoes for the past 10,000 years is not likely to present a hazard to the site.

b. Because the Trojan site was shown to be safe from a more severe hydrologic event (failure of upstream dams on the Columbia River, including Grand Coulee Dam), floods caused by volcanic activity will not present a hazard to the site.

c. Due to the distance of the Trojan site from the Cascade volcanoes and the topography, pyroclastic and lava flows do not pose a threat to the site.

d. Mount St. Helens is a young, unaltered volcano; therefore, large quantities of potential mudflow material are not likely to be available on its flanks. We conclude that mudflows are not likely to threaten the site.

e. Ashfall is considered to represent the greatest potential hazard in this part of the Northwest. It is unlikely that any ash will fall on the Trojan Plant because the prevailing winds blow away from the plant and toward the volcano; and even during those rare times when they blow toward the plant, velocities are significantly lower. Superposition of the ash distribution from the Mt. Mazama eruptions at Mount St. Helens would not adversely affect the safe shutdown capability of the site.

f. In its March 18, 1978 report to the State Department of Energy entitled "Geologic Hazards Review Trojan Nuclear Power Plant Site, Columbia County, Oregon," the State of Oregon Department of Geology and Mineral Industries concluded that "no new evidence has come to light to require modification of conclusions regarding volcanic hazards as they are presented in the FSAR."

g. The Applicant committed in the SAR's to take the necessary steps to mitigate the effects of a volcanic eruption including shutting down the plant.

References in items (a) through (e) to the "site" include the spent fuel pool.

Based on the above, the staff reaffirms its conclusion following the licensing reviews, that the Trojan site, including the spent fuel pool, is suitable from the volcanic hazards point of view.

REFERENCES
FOR PART B - VOLCANISM

1. Crandell, D.R., 1971, Postglacial lahars from Mount Rainier volcano, Washington U. S. Geological Survey Professional Paper 677, 75 pages.

2. Crandell, D. R., 1976, Preliminary Assessment of Potential Hazards from Future Volcanic Eruptions in Washington, U. S. Geological Survey Misc. Field Studies Map MF-774.

3. Crandell, D. R., 1973, Map Showing Potential Hazards from Future Eruptions of Mount Rainier, Washington, USGS Map I-836.

4. Crandell, D. R., and H. H. Waldron, 1969, "Volcanic Hazards and the Cascade Range," Office of Emergency Preparedness, Region Seven, Geologic Hazards and Public Problems Conference Proceeding, Santa Rose, Calif. (May 27-28, 1969).

5. Crandell, D. R., and D. R. Mullineaux, 1976, Potential Hazards from Future Eruptions of Mount St. Helens, Volcano, Washington, U. S. Geological Survey Open File Report 76-491.

6. Mullineaux, D. R., 1976, Preliminary Map of Volcanic Hazards in the 48 conterminous United States, MF-786.

7. Portland General Electric Company, 1973, Final Safety Analysis Report, Volume 1.

8. Portland General Electric Company, 1969, Preliminary Safety Analysis Report, Trojan Nuclear Plant, Volume 1.

9. Puget Sound Power and Light Company, 1973, Preliminary Safety Analysis Report Skagit Nuclear Power Project, Volume No. 4.

10. Shannon & Wilson, Inc., 1976, Volcanic Hazard Study Potential for Volcanic Ash Fall Pebble Springs Nuclear Plant Site, Gilliam County, Oregon, Revision 1, May 17, 1976, Report to Portland General Electric Company.

11. U. S. Atomic Energy Commission, 1970, Safety Evaluation Report by the Division of Reactor Licensing, US AEC, In the Matter of Portland General Electric Co., City of Eugene, Oregon. Pacific Power & Light Co. Trojan Nuclear Plant, Docket No. 50-344, October 19, 1970.

12. U. S. Atomic Energy Commission, 1974, Safety Evaluation Report Trojan Nuclear Plant, Docket No. 50-344 October 7, 1974.

13. U. S. Geological Survey, 1977, Status of Review Puget Sound Power and Light Company, Skagit Nuclear Power Project, Units 1 & 2 Project No. 514, Skagit County, Washington, NRC Docket Nos. 50-522 and 50-523.

14. State of Oregon Department of Geology and Mineral Industries, 1978, "Geologic Hazards Review Trojan Nuclear Power Plant Site Columbia County, Oregon," Open File Report 78-1, March 14, 1978.

15. U. S. Nuclear Regulatory Commission, 1973 Supplement No. 3 Safety Evaluation Report related to construction of Pebble Springs Nuclear Plants Units 1 and 2, Docket Nos. 50-514 and 50-516.

16. Washington Public Power Supply System, 1974, Preliminary Safety Analysis Report WPPSS Nuclear Project No. 3, Volume 3.

17. Williams, H. A., 1942, "The Geology of Crater Lake National Park, Oregon," Carnegie Institution of Washington Publication 540, 1942.

Table 3.--Mean wind speeds, in knots (1 knot = 1.15 mi/h or 1.85 km/h), at various altitudes. Based on 20-year record (1950-1970) at Quillayute, Wash. (Winds Aloft Summary of the Air Weather Service, U.S. Air Force, available from the National Climatic Center, Asheville, N.C.)

FROM-----	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
TOWARD---	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
Approx. alt. (m)																
3,000	18.6	16.3	14.8	11.5	11.6	12.4	13.8	18.1	24.2	25.7	25.4	24.2	23.5	21.8	22.4	21.2
4,300	26.7	21.7	18.7	15.1	13.7	15.5	18.2	21.5	27.2	30.7	31.3	31.1	31.0	29.4	29.6	28.5
5,500	33.2	27.8	27.9	18.5	17.6	16.8	20.8	22.9	32.2	36.6	38.6	38.3	38.4	37.3	35.7	36.9
9,100	48.6	43.8	36.5	29.9	30.2	26.4	32.2	38.0	46.8	52.5	55.9	55.4	56.2	50.8	51.6	53.9
12,200	40.9	31.5	30.3	14.9	19.7	16.9	18.8	28.0	35.8	43.8	48.5	50.3	50.9	46.2	46.3	45.4
16,200	20.1	12.4	11.3	6.3	6.4	9.0	9.7	13.8	15.5	21.1	23.7	25.8	26.2	25.1	23.7	21.4
Average--	31.4	25.6	23.2	16.0	16.5	16.1	18.9	23.7	30.3	35.1	37.2	37.5	37.7	35.1	34.9	34.6

From: Crandell, D.R. and D.R. Mullineaux, 1976, Potential Hazards from Future Eruptions of Mount St. Helens Volcano, Washington, US Geological Survey Open File Report 76-491.

REVISED ________ DATE ________ APPROVED ________ DATE ____

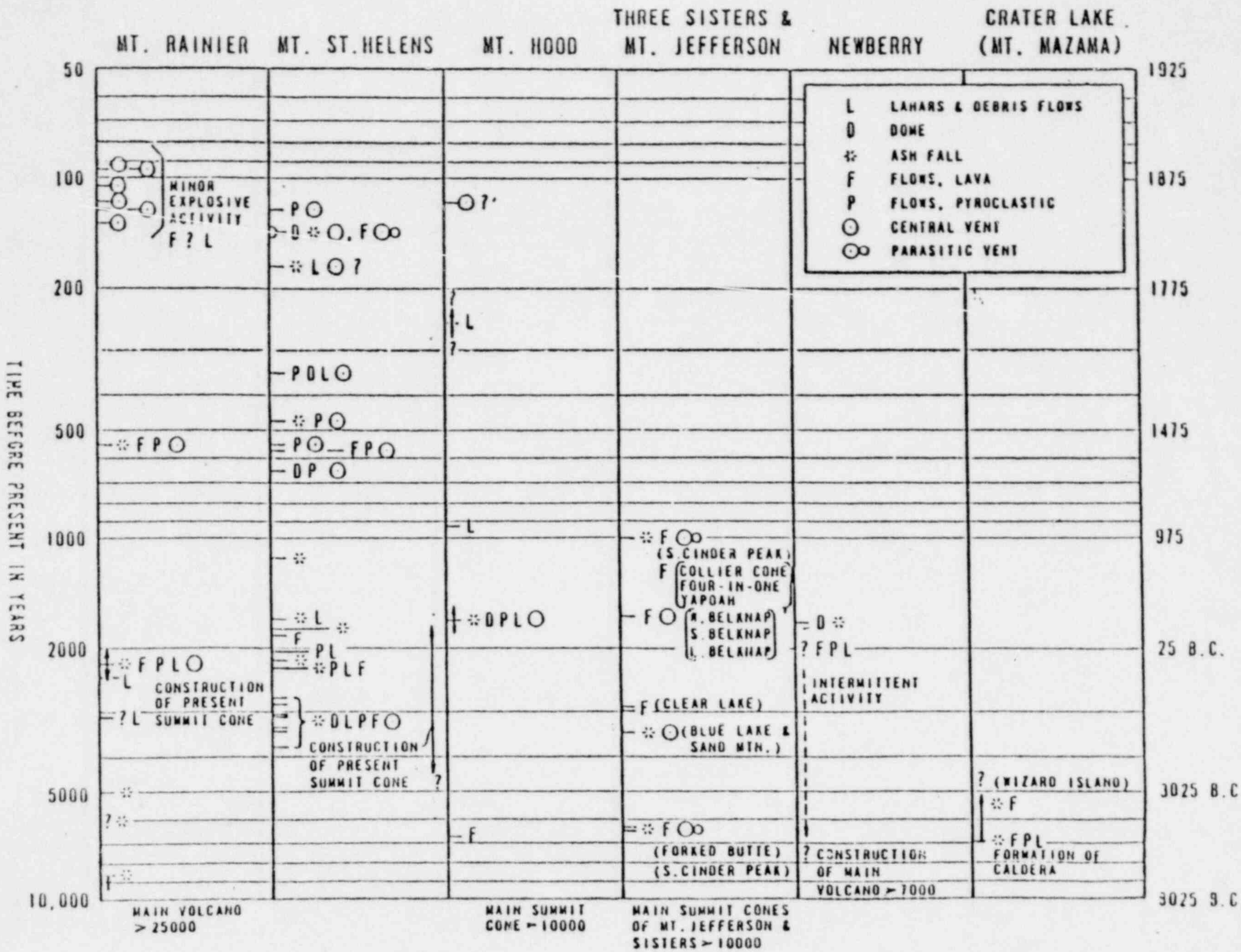

FIG. 6 SUMMARY OF POSTGLACIAL VOLCANIC ACTIVITY

From: Shannon and Wilson, Inc., 1976, Volcanic Hazard Study Potential for Volcanic Ash Fall

REVISED ________ DATE ________ APPROVED ________ DATE ____

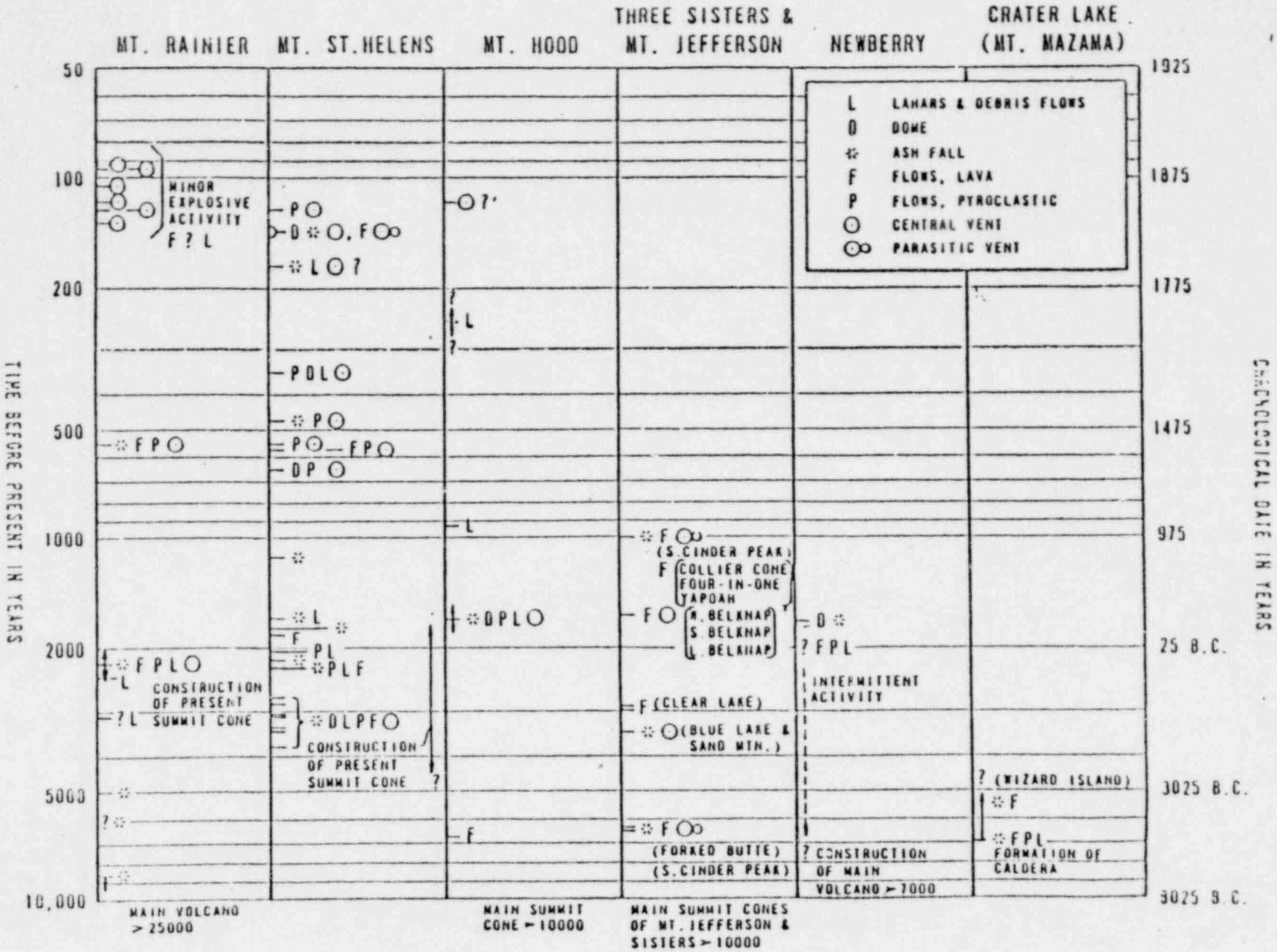

FIG. 6 SUMMARY OF POSTGLACIAL VOLCANIC ACTIVITY

From: Shannon and Wilson, Inc., 1976, Volcanic Hazard Study Potential for Volcanic Ash Fall
Pebble Springs Nuclear Plant Site, Gilliam Co. Oregon

AUG 13 1980

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	ORB#3 Rdg	JHeltemes, AEOD	BGrimes	JDiCamillo
	EDO Rdg	RAClark	RVollmer	EHughes
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		CStephens, SECY (W/incoming)*		
		LBickwit, GC*		
		JMurray, ELD *		
		ARosenthal, ASLAB		
		ASLBP		

Docket No. 50-344

Mr. Eugene Rosolie
Trojan Decommissioning Alliance
3926 Northeast 12th Street
Portland, Oregon 97212

Dear Mr. Rosolie:

This is written in response to your request on behalf of the Trojan Decommissioning Alliance that operation of the Trojan Nuclear Plant be suspended on the basis of recent volcanic activity at Mount St. Helens in Washington State. Your request has been treated under 10 CFR 2.206 of the Commission's regulations. For the reasons stated in the attached decision, your request is denied.

A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). Copies will also be filed in the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555, and in the local public document room at the Columbia County Courthouse, Law Library, Circuit Courtroom, St. Helens, Oregon 97501. As provided in 10 CFR 2.206(c), this decision will become the final action of the Commission 20 days after issuance unless the Commission elects on its own motion to review this decision.

Sincerely,

Original Signed By
E. G. Case

Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation

Enclosure:
Director's Decision
Under 10 CFR 2.206

cc w/enclosure:
See next page

(with recognition that emergency planning group agree to next to last paragraph)

*To Be Blue Bagged

SSB	EP	DE	DE	DD:NRR	D:NRR
RJackson	BGrimes	JPKnight	RHVollmer	EGCase	HRDenton
7/15/80	7/28/80	7/23/80	7/28/80	8/1/80	8/1/80

OFFICE	ORB#3:DL	ORB#3:DL	BC:ORB#3:DL	AD:OR:DL	OELD	D:DL
SURNAME	PMKreutzer	CTrammell/jdc	RAClark	TNovak		DEisenhut
DATE	7/9/80	7/22/80	7/25/80	8/1/80	8/6/80	8/6/80

DD-80-26

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of PORTLAND GENERAL ELECTRIC COMPANY (Trojan Nuclear Plant)	))))	Docket No. 50-344 (10 CFR 2.206)

DIRECTOR'S DECISION UNDER 10 CFR 2.206

By telegram dated May 29, 1980, the Trojan Decommissioning Alliance of Portland, Oregon, requested that the Commission suspend operation of the Trojan Nuclear Plant on the basis of potential dangers posed by recent volcanic activity at Mount St. Helens in Washington State. On June 3, 1980, the Commission referred this request for action to the NRC Staff for consideration under 10 CFR 2.206 of the Commission's regulations. For the reasons stated in this decision, the Alliance's request is denied.

The potential impact of volcanic activity on the safety of the Trojan facility was investigated thoroughly by government geologists (Atomic Energy Commission and the U. S. Geological Survey) before the plant was allowed to be constructed and again before the operating license was issued. This investigation and reassessment of volcanic-related hazards has continued as attested by the enclosed affidavit which was filed with the Atomic Safety and Licensing Board in the Trojan spent fuel pool expansion proceeding in April, 1978.

Although this report was filed prior to the recent volcanic activity, it is with few exceptions considered an accurate assessment today. Exceptions to the report include (1) the underestimation of the volume of debris associated with a potential mudflow, (2) exclusion of a discussion of volcano-induced earthquakes, and (3) the statement that historic data indicates that the volcano has been substantially more active in the 19th century than the 20th century. Notwithstanding the above exceptions, the report's conclusion that the Trojan site is suitable from a volcanic hazards point of view remains accurate.

The recent massive eruption of May 18, 1980 exceeded that envisioned by the Nuclear Regulatory Commission and by our advisors, the U. S. Geological Survey. Nevertheless, the effects of the recent volcanism (mudflows, earthquakes and ashfall) at the Trojan site have been minimal. Mudflows in the Toutle, Kalama, and Lewis River valleys have not compromised the safety of the Trojan plant. Volcanic-induced earthquakes have been small and have neither been felt nor recorded instrumentally at the site. Ashfall at the Trojan plant resulting from the May 25, 1980 eruption has been slight (not exceeding 1/8 of an inch) and fell at the site in the form of a muddy rain or mist. The only other indication of ash occurred on April 29, 1980 when a thin coating of the ash was noted at the Trojan site.

According to University of Washington seismologists, the volcanic-induced earthquakes mentioned previously have not exceeded Richter Magnitude 5.1 and have been concentrated in an area roughly coincidental with the volcano crater which is 35 miles northeast of the Trojan plant. None of the larger events (Magnitude 5.0 and above) have occurred closer than 35 miles to the plant. For the most part, the volcanic earthquakes have occurred at shallow depths and have consequently been felt only in the immediate vicinity of the seismic event. However, there have been unconfirmed reports of volcanic-related earthquakes (originating at

Mount St. Helens) being felt in the Longview-Kelso, Washington area, roughly five miles north of the Trojan plant. Apparently those feeling the tremors were located in areas where soil overlies bedrock. The plant is designed to safely withstand seismic levels of 0.25g peak ground acceleration. This corresponds to earthquake levels many times greater than those generated by the volcano-induced earthquakes.

We have been in constant contact with numerous state, governmental agency, and university scientists since initiation of earthquake activity and subsequent volcanic activity in the vicinity of Mount St. Helens on March 20, 1980. This surveillance, accumulation of information, and assessment will continue as long as the volcano remains active. In addition, representatives of the NRC staff visited the Trojan site and environs on June 18, 1980 for the specific purpose of assessing the safety of Trojan in light of the recent volcanic activity.

Our conclusion, based upon an evaluation of volcanic phenomena prior to construction, coupled with an assessment of the effects of the activity beginning March 20, 1980, is that the Trojan site remains suitable from a volcanic hazards viewpoint.

As to evacuation under severe ashfall conditions, this can cause transportation problems somewhat similar to those produced by road icing or heavy snowfall. The first protective action to be taken following a radiological emergency at a nuclear facility is to alert the public to take shelter and await further instructions. Seeking shelter in homes is an effective protective measure under most circumstances. A decision to evacuate is based on an assessment of the potential injury to the public from the accident and must be balanced against the risk to the public from the evacuation itself and against the conditions that prevail at the time. Seeking shelter would have to be given greater weight under ashfall conditions, depending on its severity.

Beyond about five miles, sheltering followed by relocation within several hours is essentially as effective as immediate evacuation. Within five miles, sheltering is still an effective protective measure. Under ashfall conditions, consideration would have to be given to limiting the evacuation area, depending on the exact circumstances. This would reduce the difficulty of evacuating those persons exposed to the greatest risk.

Therefore, if an accident occurred in combination with transportation difficulties due to severe volcanic ashfall, effective protecting measures can still be implemented, albeit with greater difficulty. The probability of these two events occurring simultaneously is, however, extremely low.

Based on the foregoing, your request on behalf of the Trojan Decommissioning Alliance that operation of the Trojan Nuclear Plant be suspended on the basis of the recent volcanic activity at Mount St. Helens is denied.

Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation

Enclosure: Affidavit of
Richard B. McMullen

Dated at Bethesda, Maryland
this 13th day of August, 1980

with block type insulation since construction thereby limiting them from view. The studs on two pumps were ultrasonically inspected in place in accordance with the applicable ASME Section XI code rules. These ultrasonic examinations were intended to locate cracks in bolting and were not effective in revealing wastage of the studs.

The three affected pumps will be disassembled for further cleaning and inspection of the studs and mating surfaces. Prior to reassembly, all studs exhibiting significant corrosion will be replaced. All new, or acceptable used studs, will be subjected to ultrasonic, visual and magnetic particle examinations. Installation of instrumentation for actively monitoring the leak-off lines between the flexitallic gaskets is being performed. Future inservice inspections, presently limited to ultrasonic examination, will be supplemented with visual examination of the studs installed in the reactor coolant pumps. Replacement insulation will be in the form of a removable blanket to facilitate visual examination.

The condition of the studs discovered at Ft. Calhoun raises concerns that such severe corrosion, if undetected, could lead to stud failures which could result in loss of integrity of the reactor coolant pressure boundary. The lack of effectiveness of current ultrasonic examinations in revealing wastage emphasizes the need for supplemental visual inspections and use of instrumented leak detection systems to preclude unacceptable stud degradation going undetected. Licensees should consider that the potential for undetected wastage of carbon steel bolting by a similar mechanism could exist in other components such as valves.

This IE Information Notice is provided as an early notification of a significant matter that is still under review by the NRC staff. It is expected that recipients will review the information for possible applicability to their facilities.

No specific action or written response to this IE Information Notice is required. If NRC evaluations so indicate, further licensee actions may be required.

Enclosure

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date Issued	Issued To
80-26	Evaluation of Contractor QA Programs	6/10/80	All Part 50 Licensees
80-25	Transportation of Pyrophoric Uranium	5/30/80	Material Licensee in Priority/Categories II-A, II-D, III-I and IV-DI; Agreement State Licensees in equivalent categories
80-24	Low Level Radioactive Waste Burial Criteria	5/30/80	All NRC and Agreement State Licensees
80-23	Loss of Suction to to Emergency Feedwater Pumps	5/29/80	All power reactor facilities with an OL or CP
80-22	Breakdown In Contamination Control Programs	5/28/80	All power reactor OLs and near term CPs
80-21	Anchorage and Support of Safety-Related Electrical Equipment	5/16/80	All power reactor facilities with an OL or CP
80-20	Loss of Decay Heat Removal Capability at Davis-Besse Unit 1 While in a Refueling Mode	5/8/80	All light water reactor facilities holding power reactor OLs or CPs
80-19	NIOSH Recall of Recirculating-Mode (Closed-Circuit) Self-Contained Breathing Apparatus (Rebreathers)	5/6/80	All holders of a power reactor OL, Research Reactor License, Fuel Cycle Facility License and Priority I Material License
80-18	Possible Weapons Smuggling Pouch	5/5/80	All power reactor facilities with an OL, fuel fabrication and processing facilities and Materials Priority I licensees (processors and distributors)