



Dartmouth College HANOVER · NEW HAMPSHIRE · 03753

Department of Earth Sciences · TEL. (603) 646-2373

October 24, 1979

Chairman Joseph M. Hendrie
United States Nuclear Regulatory Commission
Washington, DC

Dear Chairman Hendrie:

I am a Ph.D. candidate in geology (volcanology) and have had the opportunity to review the volcanologic portion of the safety reports relating to the Philippine Nuclear Power Plant #1. The original request for this review was from the Center for Development Policy (letter attached), but three considerations have brought me to write to you directly rather than provide my review to the Center for Development Policy, namely:

1. I believe there is a critical need for development of volcanic hazard guidelines analogous to the seismic hazard guidelines, before we can begin to properly evaluate volcanic risk of a specific site.

2. There are substantial scientific shortcomings in the volcanologic reports for PNPP#1, which as a scientist I have a moral obligation to call to your attention.

3. I work part-time for the U.S. Geological Survey (on general volcanic problems, not on the specific case of nuclear power plant siting). In view of your formal working agreements with the U.S.G.S., I feel it would be inappropriate for me to participate through any public interest group.

As a concerned volcanologist, I am anxious to assist in bringing us to a better understanding of volcanic risks for both the specific Philippine site and for any sites in volcanic terrain. In the first instance I would like to share with you my review of the volcanologic portion of the PNPP#1 safety documents; the establishment of general guidelines will clearly require the concerted and coordinated efforts of a number of volcanologists and engineers, but I would be pleased to assist that process in any way that I can.

I look forward to hearing from you.

Sincerely yours,

CPH No. 111

Christopher Newhall
Graduate Student

Enclosure

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October 24, 1979

Mr. Lindsay Mattison
Center for Development Policy
225 4th Street, NE
Washington, DC 20002

Dear Mr. Mattison:

Thank you for your call of September 20 and for the opportunity to examine the volcanologic portions of the PSAR and other documents relating to the Philippine Nuclear Power Plant #1. As I indicated to you over the phone, I am familiar with Philippine volcanic terrain and am very interested in the Mt. Natib case, in the general case of nuclear plant siting in volcanic terrain and in the value of such studies in the understanding of volcanic hazards in general. However, because I work part-time for the U.S. Geological Survey and because they already have an excellent formal working agreement with the N.R.C. for evaluating geologic hazards, it would be inappropriate for me to provide the review which you requested.

This is, as you know, one of the few proposed or established nuclear sites in the world which lie on a recently-active volcano. With rapidly growing populations and/or power needs in many volcanic areas of the world (most notably but not restricted to the circum-Pacific, Caribbean and Mediterranean areas), I think it is unlikely that this will be the last such proposal. The questions of volcanic risk at such sites are critical, tough questions; some important advances are being made in the field of volcanic hazard assessment, but much remains to be done. I believe that the best approach to these questions is to encourage the N.R.C. to initiate the process at once to establish volcanic guidelines analogous to the seismic guidelines. Before the seismic guidelines were established, geologists found it virtually impossible to agree on what constituted an "active" fault and how much risk each fault presented; now I am sure that similar disagreements will arise with respect to "active" volcanoes, and there will be many other questions of how to quantify or otherwise evaluate specific risks. The worst volcanic disasters in recorded history have been truly devastating, and the recent geologic record contains evidence of eruptions (eg. Toba, Sumatra) as much as 2 orders of magnitude (100 times) larger than the big Krakatau eruption. The questions boil down to the probabilities

of specific kinds of activity, what engineering measure can protect against the milder volcanic hazards, and what hazards are essentially beyond the engineers' art.

I strongly hope that the N.R.C. will address these general questions before it attempts to evaluate the specific questions of the Philippine site. For the immediate purpose of the preliminary hearings on the Philippine site, I am enclosing the names and phone numbers of several volcanologists who might be able to help you. I have not discussed this matter with any of the people on the list.

Sincerely yours,

Christopher Newhall
Graduate Student

Enclosure

CN/gm