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

JUL 2 1980

The Honorable Joel Deckard
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Deckard:

This is in reply to your letter dated May 15, 1980, concerning the Nuclear Regulatory Commission meeting on the considerations associated with resumption of safety-related construction work at the Marble Hill site. We are always interested in new and relevant information which might have a bearing on the safety of a facility.

To respond to your questions, we have identified five main topics.

I. Verification of the adequacy of previously placed concrete:

One of the requirements of the NRC's August 15, 1979 Order to Public Service of Indiana was to provide an evaluation of existing construction work. For concrete work, this evaluation includes three main facets.

1. Volumetric testing: The interior of the concrete was tested by a nondestructive ("microseismic") technique. The testing locations were selected on a statistical sampling basis. A sample of the nondestructive test results was further examined and verified by destructive testing. The destructive testing involved removal of concrete cores for direct examination.

2. Surface examination: All accessible concrete surfaces are being examined for defects. These examinations are still in progress.

3. Records examination: Previous testing results for the existing concrete, as well as handling and placement records, are being examined. Previous NRC inspection findings are also being reviewed.

The evaluation of all three facets of this program will determine the adequacy of all previously placed safety-related concrete. To date only the volumetric testing program has been completed.

The results of the volumetric testing, as discussed by Mr. Cordell Williams of our Region III office at the Commission meeting, have not shown any "rejectable conditions," such as evidence of significant voiding or other interior defects which could have safety implications.

These test results are not necessarily inconsistent with the honeycombing observed at the surface. Due to the inherent design configuration of the

reinforcing steel and the location of concrete discharge during placement as in most concrete construction, it is more likely that imperfections (i.e, honeycombing, excessive entrapped air, voids, sand streaking, etc.,) will occur adjacent to the form surfaces resulting in defects at or near the surface of the concrete. Existence of significant honeycombing at the surface does not by itself indicate "serious voiding" internally.

Voids are generally considered to be air pockets containing no concrete constituents; honeycomb contains substandard concrete -- aggregate without enough fines and cement paste to fill the spaces between the large aggregate.

To date, the significant surface defects found at Marble Hill would be characterized as honeycomb.

We have reviewed the transcript of the Commission meeting and have been unable to find any statement by Commissioner Hendrie concluding that "the seismic findings would indicate a remarkably good and consistent aggregate in the concrete." We did find Commissioner Hendrie's statement that, "One point I will make about the sensitivity of this stuff, if indeed you are consistently picking up small voids, a quarter, half-inch voids, and then on the occasions when you have picked one up and cored are able to verify that indeed you are finding things like that, it suggests a pretty decent continuity of the bulk concrete product." It is not at all unexpected that voids, or more correctly honeycombing, occur in general only near the surface located in the cover concrete. Such honeycombing is not serious from the standpoint of structural integrity. Your letter also seemed to indicate that somehow there was a need for "an evaluation of aggregate" to resolve the question of internal voids. We are unaware of any technical reason for your concern and there is no evidence to link honeycombing to the aggregate.

The microseismic testing method was implemented using "statistical scientific sampling," which is normally used for many types of evaluations where the possible number of samples is large. In this case, the possible number of samples was considered to be infinite, and the sampling criterion established was 95 per cent confidence with 95 per cent reliability. Based on the statistical concepts, a sample group of 59 areas was required with no defects before an inference could be made with 95% confidence regarding the total population or volume. The licensee utilized 60 sample areas. This portion of the overall evaluation and its statistical basis was thoroughly evaluated by NRC inspectors and found to be acceptable before the testing was done.

II. Availability of the Microseismic Testing Report:

The report, prepared by Sargent & Lundy, architect-engineers, is of the type normally reviewed by inspectors and many times is only available at the site due to the amount of detail contained in such reports. The

report consists of many pages of photographs and large drawings which were not easily reproduced by the NRC. After requests from persons near the site to make the report available a copy of the report was placed in the Local Public Document Room at the Madison-Jefferson County Public Library in Madison, Indiana. A copy was sent at the same time (April 1, 1980), to the Washington, D.C., Public Document Room at 1717 H Street NW, but it was subsequently transmitted, through an administrative oversight, to the NRC's internal Central Files at another location. Another copy has now been obtained and placed in the Public Document Room in Washington, D.C.

III. Request of Save the Valley that no work resume before concrete work is evaluated by an outside consultant

At the suggestion of Mr. Dattilo, attorney for Save the Valley, the NRC staff plans to retain an outside consultant for an independent evaluation of deficiencies in concrete construction and the subsequent repairs. While the NRC believes that the evaluation efforts of the NRC staff and Public Service of Indiana will be adequate, an outside consultant should serve to provide added public confidence in the NRC's conclusions when completed.

The NRC is in the process of obtaining the services of the consultant. In the absence of adverse findings by the licensee or the NRC, the staff is of the opinion that the consultant's evaluations do not have to be fully completed prior to resumption of safety related civil construction activities. Notwithstanding, before permitting further concrete placement work the staff will factor into its independent assessment the ongoing evaluation of the consultant to assure that there are no findings that should preclude resumption of concrete work.

We also believe that the basic management problems have been identified and commitments made for properly implementing corrective measures. Our plan to permit resumption of construction in a step-wise fashion with NRC check points and hold points is designed to assure that construction does in fact proceed in an acceptable manner. Resumption of construction will not compromise the NRC's ability to take appropriate measures to assure construction deficiencies are corrected and the Commission's requirements are followed.

IV. Ratios and numbers of QA/QC staff members

As stated in NRC Inspection Report 50-546/79-11, which you refer to, the ratios and numbers of QA/QC staff members listed "do not indicate that there is some ideal percentage. Its use here indicates only that reliance on contractor's QC forces was increasing and PSI's QC staff's surveillance capability was decreasing as the construction activities increased." The number of personnel alone is not an adequate criterion. The qualifications of the personnel and the organization and management of the work activities are considered a more important measure of effectiveness.

With this background, it is clear that there has been a significant change in the QA/QC organization at Marble Hill. The work assignments and programs have been reorganized, personnel qualifications have been upgraded, and the numbers have increased.

In the "numbers" consideration, the ratios have changed. The PSI QA/QC personnel comprised 31 per cent of the total QA/QC personnel on site in August 1979; on May 28, 1980, they comprised 52 per cent. The total professional staff of PSI QA/QC personnel has increased from 40 in June 1979 to 88 in May 1980. The ratios and numbers present when work resumes will change as work load and organization varies.

The ratio itself is not necessarily important. What will be assured is that there is a properly qualified staff of adequate size and an adequately managed QA/QC organization to cover all safety-related work activities.

V. Allegations on concrete sampling practices

The two concerns referred to in your letter as having a "high degree of similarity" we consider to be completely dissimilar, although both allegations were made by the same individual.

The first allegation dealt with a U.S. Testing employee being instructed by his UST supervisor to sample only trucks which contained concrete of acceptable quality. This practice, if one could visually judge what concrete was acceptable without testing, would obviously bias the "random" sampling technique. To date the NRC is not aware of any evidence to support that there was any bias in the sampling methods. When the NRC is able to speak with the alleger, new information might be obtained that would be relevant. Follow-up action might then be needed.

The second allegation deals with Newburg-Marble Hill quality control and production personnel violating specification requirements during "tightened" concrete sampling.

The NRC inspection staff has made an exhaustive but unsuccessful effort to obtain further information from this alleger to assist in conducting its investigation. Nearly 3 months passed before the NRC was able to obtain the information package of statements and documents concerning the allegations. Nearly 7 months passed before the NRC was able to talk directly to the alleger and then we were not able to discuss the allegations.

The alleger was interviewed by the Federal Bureau of Investigation, and the inspection staff has reviewed a transcript of that interview. The interview, however, was not conducted by persons familiar with concrete technology or construction practices. The documents provided to the Department of Justice are also too general to be useful in the investigation of the technical considerations of concern to the NRC.

Because the available information was not considered sufficiently detailed for adequate technical investigation a Region III investigation specialist and construction inspector spent three weeks at Marble Hill pursuing the allegations. Some of the information developed during the investigation appears to substantiate some of the concerns, but more specific information is still needed. To that end the NRC exercised all possible avenues to interview the alleger, including a subpoena issued by the Commission.

We then sought an interview with the alleger to obtain necessary information through the authority of the Department of Justice. In order to speak to the alleger, it has been necessary for the Commission to issue a subpoena and seek enforcement of that subpoena in a Federal court. The subpoena could not be served since the alleger had left the Court's jurisdiction. However, the alleger did agree to an interview, conducted on June 17, 1980, the results of which are still being evaluated.

I hope this response has adequately dealt with your areas of concern. If we can be of further assistance, please let us know.

Sincerely,
(Signed) William J. Dircks

William J. Dircks
Acting Executive Director
for Operations

Enclosure:
Summarized Chronology

cc: w/enclosure
Senator Birch Bayh
Senator Wendell Ford
Congressman Lee Hamilton
Congressman Toby Moffett