713381

March 14, 1975

CONF.

COMPANION DOC 713382

Earl K. Hyde
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LBL

Dear Earl:

I have reviewed seven projects (109 forms) proposed by Ralph Thomas. I have also made some inquiries to DOER with respect to their planned support of health physics research. I am told that the following guidelines will apply: 1) Very strong research programs will be supported through the Radiation Physics Division; 2) important projects relating to operational safety standards can also be supported; 3) projects relating to functions of the nuclear regulatory agency can be submitted directly to them; 4) Routine problems in gamma-ray and neutron measurements will be de-emphasized.

I was also told that it is logical for accelerator budgets to support specialized health physics groups. Responsibility for running the accelerator also implies that it will be run under safe conditions, and a certain amount of health physics research to assure these conditions is logical.

The seven different proposals will be discussed briefly in what I believe might be the order of their priority:

1) Heavy Ion Dosimetry Studies: This relates to the current biomedical program at the BEVALAC and is aimed at better absolute measurement of the dose. I think that, of the four techniques mentioned, the Health Physics Division has expertise in two: these are the TLD Dosimetry and activation dosimetry. I believe it would be of some benefit if these activities were to be supported. The Biomedical group, particularly John Lyman, have a great deal of background in work with ionization chambers, and the Radiological Physics group has ongoing projects on track structure and fragmentation parameters. I believe these should remain. Primary responsibility for using and developing these techniques should remain where it is. Since it is planned that a certain amount of dosimetry would be performed from part of the support received from the Biomedical Division and preliminary agreement exists to support several radiological physicists from the BEVALAC budget, it would be logical if, from this budget, some support at least were extended to a designated member of the Health Physics Division, who could carry on research and development comparing his techniques with others. In this case, then, it might not be necessary to ask for separate support from Washington.

2) Measurement of Neutron Yields from Heavy-Ion Interactions: The measurement of neutron yields and of other penetrating radiations in the heavy-ion beam has significance both for biological studies and for protection of personnel. It is important to know the dose that a body exposed to the beam might receive in parts which are not in the primary beam. The group has expertise in neutron measurements.

Walter Schimmerling of the Biomedical Division has earlier extended a proposal through the Laboratory to NASA. This agency has interest in neutron yields from heavy ions, since this problem occurs in the atmosphere during radiations of cosmic-ray intensity and also in spaceships. I anticipate that Schimmerling will receive modest support for five years and perhaps a good amount of instrumentation.

I believe it would be of benefit to both groups if Dr. Schimmerling and Dr. Thomas and his group could agree on a collaborative study with input from both groups. It might be possible again that the BEVALAC budget could make a contribution to this study. If it is not possible, a separate 189 might be written up by Thomas and Schimmerling. I am doubtful, however, that it would receive support from Radiological Physics in ERDA in excess of what we are already receiving.

3/4) Comprehensive Study of Gamma Radiation in the Environment; and Improvement Program for LBL Low-Background Counting Facility: These two projects appear to be part of the same: in both, spark-chamber spectroscopy of gamma radiation is proposed for various materials, and the spectroscopy would be carried out in the low-background facility. With respect to the measurement proposal, the Berkeley group has had a history of measuring gamma-ray backgrounds from various sources. It is my belief that under ERDA this will be much less supported than in the past and that only those aspects will be supported which have direct relevance to the energy problem and/or to man's safety. I suggest, therefore, that this project might be rewritten with specific goals in mind; for example, radioactivity brought to the surface by gases, liquids and solids in geothermal plants, or radioactivity in optical and ophthalmic glasses. The latter problem has presented itself recently; optical and ophthalmic glasses have a certain amount of thorium and uranium contamination. A survey is needed for understanding the possible magnitude of the health hazard involved.

There is great interest in contamination due to plutonium and other heavy isotopes; however, the way the project is written, in a very ambitious and rather diffuse way (since almost the entire surface of the earth could be measured in detail), perhaps a more definite focus could increase agency interest.

Perhaps the Division of Operational Safety and Standards, or, alternatively, the Regulatory Agency, might be interested in these two projects.

The low-background facility in this development in a sense relates to the level of gamma-activity measurements. However, perhaps there need not be a special project on this; the Laboratory could use some "equipment funds" each year to modernize this facility.

5/6) Improvements on the Spark Chamber Neutron and Proton Spectrometer; and Low-Level, Dose-Equivalent Measurements of Accelerator-Produced Neutrons: The development of the spark-chamber spectrometer is an important contribution from Berkeley, and this is a useful instrument. Need for the data arises, however, mostly in relation to safety with accelerators. Since particle research is being discontinued at Berkeley and since the shielding appears to be safe, ERDA might not have very much rationale to continue this work. Maybe, however, some novel reasons could be advanced to increase interest in the work, for example: 1) Studies related to specific design of PEP and the protection of personnel around the PEP facilities; 2) Multiple-prong and nuclear stars initiated by very high-energy neutrons. These stars are known to be present in cosmic rays and have been seen at the Dattavia Accelerator also. They may have biological significance because multiple-prong events act as high-LET particles. Their yield at high energy is not known in detail.

7) Study on the Disposal of High-Energy Accelerators: It appears to me that when accelerators have been decommissioned, the expenses of shutdown should include appropriate decontamination and disposal measures. If this is not the case, as the project would indicate then this program becomes one of high priority, and it should definitely be done on a nationwide basis. If this is the case, it may merit greater expenditure of time and finances than indicated in the project description.

Please let me know if I can be of further help.

Sincerely,

Cornelius A. Tobias
CAT/lw