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MEMORANDUM FOR: CHIEF OF RESEARCH AND DEVELOPMENT
ASSISTANT SECRETARY OF THE ARMY (R&D)
IN TURN

20 SEP 1968

SUBJECT: Final Report of the ASAP Ad Hoc Study Group on Army Nuclear
Effects Research Center

1. Transmitted herewith is the final report of the ASAP Ad Hoc Study Group on the Army Nuclear Effects Research Center.
2. I believe that the report adequately meets the objectives of the original terms of reference. For your convenience, the report has been divided into two parts. The first part is an Executive Summary which includes a summary of our findings, conclusions, and recommendations. Part II provides more detailed discussion to substantiate our findings. Additional backup data (trip reports, briefing scripts, correspondence between members, and the interim report of 3 May 1968) are available in the OCRD files.
3. I hope that our recommendations prove useful to you. I know I speak for all the study group members in saying that it was an honor and a pleasure to participate with the Army in this very important and complex problem.

1 Incl
as



E. ARTHUR TRABANT
Chairman, Ad Hoc Study Group
Nuclear Weapons Effects Research

c.c. Study Group Members

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FINAL REPORT
OF
ARMY SCIENTIFIC ADVISORY PANEL
(ASAP)

AD HOC GROUP
ON

ARMY NUCLEAR EFFECTS
RESEARCH CENTER (U)

12 SEPTEMBER 1968

GROUP 3
Downgraded at 12-year intervals; not
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PART I - EXECUTIVE SUMMARY

A. Objectives

1. Evaluate the present nuclear research program to determine whether there is a need for a single nuclear effects research center.
2. If it is determined that such a center is desirable, what should be its characteristics.
3. If appropriate, determine desirable locations for such a center.

B. Summary of Findings

The Ad Hoc group decided that reorganization and consolidation of the laboratories must be examined with regard to the long range mission of the NWER/ET program. The committee, therefore, set out to discover and understand this mission in order that proposed solutions would be consistent with the objectives of the Army. This effort, which involved extensive briefings held at the Pentagon as well as site visitations by committee members produced the following information:

1. The NWER/ET program appears to be of critical importance to national security and, therefore, should have a high priority. It appeared to the Committee that this Army research program carried no special priority at the present time.
2. A clear definition of the mission and objectives of the NWER/ET program does not exist. No satisfactory expression of purpose was found in any document. The briefings were equally frustrating in this regard.
3. The organizational structure for managing the NWER/ET work is inadequate.

4. The present NWER/ET activity is not sufficiently responsive to System Project Managers, the Commodity Commands, and the Combat Developments Command (CDC). There seems to be little sense of urgency with respect to the requirements of these agencies, and they are not getting the necessary NWER/ET information.

5. There is little evidence of suitable long range planning.

6. There is an excessive dependence upon DASA for funding of the Army NWER/ET program, leading to subrogation of Army needs by DASA requirements.

7. The NWER/ET program personnel, facilities, and funds are fragmented at twelve or more laboratories and locations.

8. The technical competence of the staff at the NWER/ET laboratories is generally acceptable.

9. The present work includes two sets of technical disciplines: those associated with electronics and electromagnetic phenomena, and those associated with thermal, shock and blast phenomena.

C. Conclusions

1. It would be highly desirable to consolidate the majority of the NWER/ET program into a single research center. However, the planning for consolidation should not occur until after:

a) The establishment of a mission for the program.

b) The establishment of effective, responsible, high level management for the program.

- c) The establishment of a long range program plan. This plan would form the basis for the consolidation.
2. Efficiency could be enhanced in the interim if those laboratories involving closely related technical disciplines were consolidated as soon as possible.

D. Recommendations

The committee addressed the objective as stated. It considered the question of a central research facility as a means rather than an end in itself. With no discernible mission from which to depart or person identified with the responsibility of accomplishing the mission, the following recommendations are submitted for consideration:

1. Establish a Program Manager responsible for the NWER/ET program, who reports directly to the Commanding General, United States Army Materiel Command (CG, USAMC), and advises Project Managers and agency heads, as appropriate, on NWER/ET including nuclear vulnerability and hardening. The Program Manager should be responsible for:
 - a) Defining the NWER/ET mission and objectives in coordination with the CDC, Commodity Commands, and System Project Managers.
 - b) Preparing and executing a plan for interim and long range consolidation of Army NWER/ET effort and facilities based upon the mission and objectives.
 - c) Defining the role of each laboratory or facility in NWER/ET.
 - d) Determining the priorities of NWER/ET effort based upon the Army mission and requirements.

- e) Preparing a program document in which he assigns specific tasks to each laboratory or facility based on the Army priorities.
 - f) Preparing long range plans which establish hardness goals, new hardness approaches and techniques, and theoretical limits of hardening.
 - g) Coordinating with the DASA in the performance of the NWER/ET program to insure that Army priority requirements are being satisfied.
 - h) Programming, justifying, and allocating research funds to Army laboratories and facilities performing NWER/ET work.
2. As a long range objective, consolidate to the greatest extent possible the nuclear effects research related to radiation, electronics, and electromagnetic phenomena. This would include the EMP effort at MERDC, NDL (except the Van de Graaff), the electronics and EMP work of the Commodity Commands and the TREE work at Harry Diamond Laboratories. The best location for this consolidated Laboratory appears to be White Oak, Maryland where the site would be shared with HDL. As an interim step within the next few years, we recommend completing the merger of BRL and NDL as well as moving the MERDC EMP activity to White Oak. The latter group should be combined with HDL TREE personnel and established as an organization separate from HDL but at the same White Oak site.

A contract arrangement with a university for operation of the Tandem Van de Graaff facility should be considered. For the time

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being we would recommend retaining the shock research at WES and the blast work at BRL.

3. Establish a separate program element in the Army RDT&E Program 6 for NWER/ET.

PART II - DISCUSSION

A. Priority and Funding of NWER/ET

The Vietnam conflict, and the decision to deploy the SENTINEL ABM system has relegated nuclear research programs to a low level of priority in research and development spending. The Ad Hoc Group was concerned that the NWER/ET program was viewed as just another program in the portfolio of R&D. Certainly, no evidence to the contrary was obtained in any of the briefings or visits.

The committee is somewhat perplexed by this seeming low priority, since the ultimate survivability of the United States is involved. The question of establishment of a single research center at times seemed out of context in view of the relative ease with which this program has been curtailed. The committee concluded that consolidation of effort at a central research laboratory should be undertaken as only one part of a stable, long term NWER/ET program operated with a sense of urgency to meet well-defined objectives.

Presently NWER/ET funds are not identified by separate projects under the Nuclear Investigations program element in the Army Research, Development, Test, and Evaluation (RDT&E) Program 6. The NWER/ET funds are included in several of nine projects. A separate program element should be established with a minimum level of funding which will insure that the research teams essential to program continuity remain intact. The base level of support cannot

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be determined until the long range objectives of the program are defined. This program element should be of high enough priority to be funded generously in good years, and not drop below the minimum in lean years. In the past the Army funded NWER/ET work has fluctuated greatly, having been dependent on the designated research and development priorities for each particular year. Currently all research and development programs related to the Vietnam conflict and strategic weapon systems (SENTINEL) have top priority. Therefore, the Army is heavily dependent on DASA funds in order to accomplish vital NWER/ET work. The only other important source of funds is the Project Managers who occasionally sponsor research at these laboratories with their allocated funds. The PERSHING Project Officer and SENTINEL Systems Manager are current examples. However, it should be emphasized that these funds vary greatly from year to year.

B. Fragmentation of NWER/ET

Historically, the Army NWER/ET work has been conducted at as many as 14 laboratories or facilities. This does not include contracted research which would substantially increase this figure. Currently the Army has approximately 450 personnel engaged in NWER/ET work at 12 separate locations. These laboratories or facilities are located throughout the country, but most are located along the East Coast. Only one of these laboratories, the Nuclear Defense Laboratory (NDL), is devoted entirely to nuclear weapons effects research. Others, such as the Ballistic Research Laboratory (BRL), Harry Diamond Laboratories (HDL), and Waterways Experiment Station (WES), conduct NWER/ET

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programs which represent but a small part of their total effort.

This fragmentation of effort at many locations was observed in individual visits to the facilities and laboratories by the Ad Hoc Group.

The level of Army funding at any one of these laboratories has varied from $1\frac{1}{2}$ million dollars to zero in any given year. Not all laboratories or facilities are funded each year, and the amount is dependent upon such factors as DASA allocated funds, level of demonstrated expertise, competence, and available equipment. It is clear that fragmentation is both geographical and fiscal.

C. Definition of Mission and Requirements for NWER/ET

The Ad Hoc Group received briefings from nearly all of the current participants in the NWER/ET program. These briefings were given by laboratory management and staff. Discussions were also held with key members of General Besson's staff in AMC. Matters associated with technical detail generally were well prepared and presented. On the other hand, questions from the committee regarding over-all mission objectives and the setting of priorities for NWER/ET in the Army laboratories were not answered in a reassuring way. This is not a reflection on any individual but, in the opinion of the Ad Hoc Group, is a criticism of the overall management system which should be directing the program and providing answers to these questions. Some guidance for nuclear effects research was evident in a variety of regulations and documents published by CDC, AMC, and Department

of the Army agencies. There is, however, no single document that provides a specific mission with objectives and priorities.

The Army laboratories involved in NWER/ET can be described as a collection of technical groups working in areas more or less germane to nuclear weapons effects under the broad umbrella of a document called the QRR. The scope, depth, degree, and priority of the work are not properly associated with an Army NWER/ET stated, understood, documented and managed mission.

The QRR is published annually by the Institute of Nuclear Studies (INS), part of the CDC. This document contains the broad requirements for nuclear effects research broken down into 13 effects categories. The published requirements vary with time due to technological advances in the state-of-the-art and the introduction of new nuclear weapons systems. Even if substantial funds were available for the NWER/ET work, several years would be required to satisfy those existing requirements which could be met within the limits imposed by the ban on atmospheric testing. The Ad Hoc Group feels that utility of the document is somewhat hindered by its size, the statement of requirements in exceedingly broad terms, and the large number of priority 1 items. These characteristics provide the laboratories with excessive latitude in the selection of work proposals. There have also been proposals that have not addressed specific Army requirements or have addressed other than priority 1 requirements.

INS has a very limited staff (6 personnel) that publishes the QRR in addition to many other duties. There appears to be insufficient feedback to INS from the various agencies, laboratories and commands. As a result, INS has difficulty in determining what requirements have been met. The feedback which exists results from personal visits by INS staff and review of published reports. This is an overwhelming job for such a small staff. They are further hindered because published reports of NWER/ET work do not, in all cases, include INS in the distribution.

An essential step linking the requirements document to the formulation of laboratory work proposals appears to be missing. We refer to an annual program document that states specific missions, objectives, and tasks for each laboratory and facility doing work in NWER/ET. The program document would establish the work program based on the priorities of the requirements and the capabilities of the personnel and equipment of the laboratories.

In addition to a program document, a long range (5-10 years) planning document is essential. This document should be responsive to the long range needs of the people in the Army who are responsible for end items. It should also be based upon long range systems needs. A good planning document can be an excellent guide to the laboratories conducting nuclear effects research and designing hardened systems and components. It should concern itself with future technical challenges

and constraints as defined by Army system programs. Perhaps hardened electronics will not suffice in the future, and an entirely new technological solution will be required.

D. Organizational Structure

A research program requires a mission, a person in charge of an organization responsible for the achievement of the mission objectives, and a long range plan. The Ad Hoc Group contends that the NWER/ET program should be provided with these essentials. The establishment of a single research center might be one means by which the person in charge achieves the objectives more efficiently as a part of an integrated long range plan. It is felt that consolidation of laboratories into a central facility is appropriate and ultimately highly desirable, but it does not seem prudent to recommend proceeding blindly without the essentials previously cited.

As noted in section C above, the committee could not uncover the man in charge of the NWER/ET program. The laboratory and field work is conducted at various locations described in section B. The administration and management of the program apparently are equally fragmented. These functions are accomplished at the Office of The Surgeon General (OTSG), the Office of the Chief of Engineers (OCE) and Headquarters, U. S. Army Material Command (USAMC) level. The Surgeon General's (TSG) portion of NWER/ET concerns biomedical

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effects resulting from nuclear detonations, and falls under the supervision and administration of this Army agency due to its medical aspects. It is more difficult to find a well defined dividing line between those portions of the program under AMC and OCE. Guidance is provided by AR 705-5 (Army Research and Development), Appendix A, which states that OCE is responsible for protective construction, to include protection of shore and navigation facilities, from underwater bursts, ground response from nuclear demolitions, nuclear excavations for construction purposes, and underwater programs. AMC has the remaining areas of responsibility in NWER/ET. The Office of the Chief of Research and Development (OCRD) has the task of coordinating those efforts as outlined in AR 705-5.

The Nuclear Branch (4 personnel) of the Nuclear, Chemical-Biological Division, OCRD, allocates funds and supervises the entire Army NWER/ET program with the exception of TSG portion, which is funded and supervised by the Life Sciences Division, OCRD. OCRD is not physically able to accomplish all tasks specified in AR 705-5 which include establishing Department of Army requirements for nuclear weapons effects information and planning, coordinating and supervising Department of Army participation in NWER/ET, formulating policy guidance to insure that proposals from all Department of Army agencies and commands form a comprehensive program, and

approving all NWER/ET proposals forwarded through TSG, OCE, and Headquarters, AMC. These functions are either not being satisfactorily accomplished or are being accomplished at TSG, OCE, and AMC level.

Since by far the greatest portion of the program is managed by AMC, OCRD must rely on AMC to effectively coordinate the entire program. Headquarters, AMC, lacks sufficient personnel and the necessary expertise in all NWER/ET technical areas to effectively manage the program, and depends on appointed committees of competent personnel from the laboratories to review work proposals and recommend approval or disapproval. The proposals are reviewed by the committees and the agency headquarters (TSG, OCE, AMC) prior to final approval or disapproval or forwarding to DASA. This entire process can cause delays of from one to three years in initiation of research that is required by the end item commands. AMC has designated a lead laboratory in each major nuclear effects category, and the chairman of each effects committee is selected from this lead laboratory.

Presently disagreements among AMC, OCE, and TSG must be resolved by mutual consent or at the next higher level in the Department of Army Staff, the Office of the Chief of Research and Development (OCRD). The Nuclear Branch of the Nuclear, Chemical-Biological Division, OCRD, has general staff supervision of the AMC and OCE

CONFIDENTIAL

portion while the Life Sciences Division has general staff supervision of the TSG portion. This supervision lacks the depth that management, by definition, entails. The Ad Hoc Group feels that this program is of sufficient importance to justify placing all NWER/ET management functions in the hands of a single agency. Since the majority of the program and the greatest number of laboratories belong to AMC, the logical agency is AMC. Also, a single man in charge and responsible for the NWER/ET program should be designated organizationally subordinate to the Commanding General, USAMC. This Program Manager would be the focal point for all Army NWER/ET work. The Program Manager would be responsible for:

- a) Defining the NWER/ET mission and objectives in coordination with the CDC, Commodity Commands, and System Project Managers.
- b) Preparing and executing a plan for interim and long range consolidation of Army NWER/ET effort and facilities based upon the mission and objectives.
- c) Defining the role of each laboratory or facility in NWER/ET.
- d) Determining the priorities of NWER/ET effort based upon the Army mission and requirements.
- e) Preparing a program document in which he assigns specific tasks to each laboratory or facility based on the Army priorities.
- f) Preparing long range plans which establish hardness goals, new hardness approaches and techniques, and theoretical limits of hardening.
- g) Coordinating with the DASA in the performance of the NWER/ET

program to insure that Army priority requirements are being satisfied.

- h) Programming, justifying, and allocating research funds to Army laboratories and facilities performing NWER/ET work.

The Program Manager, responsible directly to the Commanding General, USAMC, would have to be given the power in writing to infringe on TSG and OCE in order to manage those portions of NWER/ET program conducted within their organizations. Since the Manager would allocate funds for these programs, this would not be unusual. However, he would have to use tact and diplomacy in dealing with TSG and the Chief of Engineers along with their subordinates.

Although the Ad Hoc Group was concerned only with nuclear weapons effects, it does recognize that more visibility would be achieved for all nuclear programs by designating an overall Army Nuclear Program Manager with commensurate management responsibilities and assets. He alone would be responsible for the Army's basic and applied research in all nuclear programs of which the NWER/ET program is but one. Since this matter goes beyond the scope of the current study, it is merely noted for possible future consideration.

E. Influence of DASA

The purpose of the Army NWER/ET work is to provide information essential to the fulfillment of the Army's mission and requirements. Funding for the total Department of Defense (DOD) NWER/ET program is divided approximately equally between DASA and the Services (Army, Navy and Air Force). Thus, the Army funded work represents one-sixth or less

of the total DOD program. Only one nuclear research laboratory in the DOD is managed and administered by DASA. Therefore, DASA is dependent upon the Service laboratories and facilities for almost all of its in-house research.

Funds allocated to DASA and the Army are used for both in-house and contractual research. It is normal to find more funds allocated to Army NWER/ET laboratories by DASA than by the Army. Thus DASA has an extremely significant influence on the Army laboratories. The Ad Hoc Group observed that in many cases the Army nuclear effects research work is captive to DASA requirements at the expense of Army requirements. An example will perhaps best serve to describe the concern of the Ad Hoc Group.

DASA is chiefly concerned with NWER/ET as it relates to strategic systems. In order to develop the competence that will attract DASA money, Army research also has become heavily concerned with strategic systems. It seems that this has been done to the virtual exclusion of the requirements of tactical systems. ECOM now finds itself with a need to establish requirements for hardening MALLARD, TACFIRE, radars and communication systems, but with no significant background of technology from which to draw.

F. Interim Consolidation

The Ad Hoc Group was formed to determine the advisability of establishing an Army Nuclear Effects Research Center. As previously discussed, the Group concluded early that this issue could not be faced directly because of uncertainties concerning the NWER/ET program mission,

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long range planning and management responsibilities. These matters were studied and recommendations are, herewith submitted.

In the course of its review, the Ad Hoc Group did reach conclusions concerning consolidation and has made suggestions which are discussed below. However, the members wish to stress again that when effective management for Army NWER/ET has been set up and long range plans developed, these recommendations should be reconsidered. We believe that interim consolidation over a 3 year period can result in a more effective and efficient NWER/ET program. In the long run, we feel it is more important to implement our recommendations concerning management and planning than to carry out our recommendation that a single Nuclear Effects Research Center be established by AMC. If the former recommendations are implemented, the Ad Hoc Group is confident that a wise decision concerning ultimate consolidation will result.

The first recommendation concerning consolidation is for immediate organizational consolidation of NWER/ET (see section D).

Secondly, a degree of physical consolidation should be undertaken as soon as possible with the idea of completing this initial phase within 3 years. The Group observed that the NWER/ET program was fragmented (see section B) with regard to personnel and equipment. Consolidation is expected to result in a more economically efficient operation. More importantly, there should be tangible technical benefits as a result of bringing together small groups of scientists and engineers with shared interests. These larger pools of technical manpower will have greater capability than would the existing individual organizations attempting

to work together while separated geographically and administratively. Also, the time it takes for effective response to complex problems will be reduced.

Consolidation of the BRL and NDL NWER/ET efforts can be achieved with little difficulty due to their close proximity. This would be a logical first step in any consolidation program. HDL's NWER/ET work is concerned mainly with transient radiation effects on electronics (TREE) and is closely coupled with fuze development and other hardware-oriented programs. The NWER/ET program (both DASA and Army) represents a small portion (10%) of the total funded programs at HDL. At MERDC the EMP work is not closely coupled with other programs. At both WES and BRL the nuclear research effort is very closely coupled to other non-nuclear programs, and separation of this nuclear segment may prove to be undesirable.

MERDC and HDL have demonstrated outstanding competence in the complex effects of EMP and TREE, respectively. This competence is due largely to a few key personnel who must be retained in any proposed consolidation. Since both EMP and TREE concern the vulnerability of electronic systems, it would be advantageous if they could be consolidated at one location. It is planned that HDL will move to a new site adjacent to the Naval Ordnance Laboratory at White Oak, Maryland within the next two years. At about the same time it would be desirable to move the MERDC EMP effort to this location which has ample space. DASA has planned to build a major TREE facility at White Oak which would be operated by HDL. This is one reason it would be more appropriate to move

the MERDC EMP activity to HDL's new location than vice versa. This coupling of BRL-NDL and HDL-MERDC would be the first step in a consolidation program and would reduce the number of significant Army NWER laboratories to three: BRL-NDL, HDL-MERDC, and WES. Related work at Commodity Commands would not be affected.

Even this initial consolidation would create problems including loss of personnel who do not wish to relocate, cost of relocating families and equipment, and the space requirements at the new site. The Ad Hoc Group has not overlooked these problems but believes that consolidation should begin in spite of them. Ultimately, this is in the best interests of the Army NWER/ET program.

It was apparent to the Group that it will not be practical to relocate certain major facilities, such as the Tandem Van de Graaff (NDL) and the Army Pulse Reactor Facility (BRL), at any stage of a consolidation program. Such facilities must remain at their present locations and should be staffed with essential scientific, operations, and maintenance personnel. However, the technical staff should be kept to the minimum consistent with productive operation. Professional personnel not needed at the facility on a day-to-day basis should be assigned to a consolidated laboratory and eventually to the single nuclear effects center. The committee believes that an attractive solution for the Tandem Van de Graaff would be to have a university assume responsibility for it under contract to the Army.

The administrative consolidation of NDL and BRL which already has begun appears to be consistent with our recommendations and should con-

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tinue. However, the man in charge of the consolidated BRL-NDL effort in NWER/ET should be made responsible to the Program Manager for all Army NWER/ET. A somewhat different course is suggested at HDL-MERDC. Here the nuclear activity should be separated organizationally and administratively from HDL and separately identified, perhaps as the Army Nuclear Effects Research Center. The director of the Center would report to the NWER/ET Program Manager. The idea would be to set up a separate organization which, through future, long range consolidation, would grow into the Army center for nuclear weapons effects work. In other words, even at this early stage, the NWER/ET center would be colocated with HDL at White Oak, rather than being a part of HDL.

G. Long Range Consolidation

Interim consolidation completed during the next 3 years would reduce the number of nuclear effects research laboratories to three: BRL-NDL, HDL-MERDC, and WES (not including Commodity Commands). The next logical step in creating one nuclear effects research center would require major movement of personnel and equipment to the site of the center. This ultimate consolidation would simplify management, programming, and funding. Travel time between many present facilities would be eliminated. Major equipment such as the Tandem Van de Graaff would not be relocated but would continue to operate at their present sites.

Two of the three complexes for nuclear effects research would be logical candidates as the site for a research center. These are the present BRL-NDL area and the new HDL White Oak location. There are advantages and disadvantages to both locations. Merger of the nuclear

activities of HDL and MERDC will create a technically strong group in the critical effects areas of TREE and EMP. If the recommendation for interim consolidation is followed, this colocated organization at HDL can serve as a nucleus for establishing a centralized management group in NWER/ET. At BRL and NDL the expertise in blast, thermal, and initial and residual nuclear radiation could provide the basis for establishing a management group. The current Army requirements have emphasized the TREE and EMP areas as compared to other effects. In view of this and probable future requirements, White Oak would be the better location for establishment of the management group and research center. The construction of the TREE facility at White Oak will provide a major simulation facility. However, the blast generators and Army Pulse Reactor Facility at BRL and Tandem Van de Graaff at NDL are existing major facilities for nuclear effects research. The location of major equipment would thus favor selection of the Aberdeen area as the site of the proposed research center.

From the standpoint of physical space there is no problem at either the BRL-NDL or new HDL locations. There are other additional reasons for selecting White Oak. One is that it is closer to established universities that could attract top personnel. Another is that personnel would be more inclined to move to the greater Washington area than the Aberdeen-Edgewood area. And lastly, there are many more nuclear oriented agencies, laboratories, and major contractors in the Washington area than there are in the Aberdeen-Edgewood area. After careful consideration of all factors the future HDL site at White Oak, Maryland seems to us to be the better of the two candidates.

It is the Ad Hoc Group's present thinking that long range consolidation would result in a single Army Nuclear Effects Research Center at White Oak. This laboratory would serve as the focal point for the entire Army NWER/ET program. However, work would continue in specialized areas at other sites, especially where those sites offered extensive supporting services not available at White Oak. The shock research at WES is an excellent example. Similarly, the blast research at BRL should continue at that site although much of the NWER/ET work at BRL should be relocated.

Existing small scale NWER/ET programs such as that at MICOM should be phased out and no new ones initiated, except for extremely compelling reasons, at any location except that of the Center. During the course of the consolidation program, the work of the Commodity Commands should be carefully reviewed and as much as feasible transferred to the Center. These information users must retain sufficient staff capability to provide liaison between the Center and the hardware designers. On the other hand, research and development in nuclear effects will be done more effectively at the Center. One of the major incentives to consolidate the Army efforts is to avoid duplication.

STUDY PROPOSAL SUBMITTED BY

COLONEL JOEL E. KUFFNER, CHIEF, NOB DIVISION

Proposed Name - ASAP Ad Hoc Group on The Army Nuclear Effects Research Center.

Problem. To determine the need for a nuclear effects research center, its research program, and the most effective location.

Considerations.

The purpose of the Army nuclear effects research program is to complement that of the Defense Atomic Support Agency (DASA) by investigating those areas in which the Army has sole interest or those not being funded by DASA. The present program is conducted in 12 different field installations according to the scientific discipline involved. In most instances, these installations are separated by large geographical distances. The present program, both DASA and Army funded, is approximately \$40 million per year. It employs about 550 persons of whom roughly 70% have scientific or engineering backgrounds with a minimum educational level of a baccalaureate degree.

The major problem in the nuclear effects research program is that the present organizational structure does not provide the most effective utilization of technical personnel and facilities. This structure has the following deficiencies:

1. Large number of different installations engaged in the accomplishment of the mission.
2. Widely scattered locations.
3. Duplication of research tools.
4. Lack of staffing in depth.
5. Duplication of administrative and support activities.

Proposed Terms of Reference. In its study of the problem, the group should:

1. Evaluate the present nuclear research program to determine whether there is a need for a single nuclear effects research center.

2. If it is determined that such a center is desirable, what should be its characteristics.

3. If appropriate, determine desirable locations for such a center.

Proposed Membership

Chairman - Dr. E. Arthur Trabant

Members - Dr. Ali B. Cambel

Dr. Charles N. Kimball

Dr. William D. Murray

Special Consultant - Dr. Carlyle J. Roberts

Military Staff Assistant - LTC Stanley J. Kuick