**DEPARTMENT OF ENERGY
WEAPONS COMPLEX SIZING STUDY**

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

RECEIVED
AUG 05 1993
OSTI

MASTER

November 2, 1987

12/6/88:cy to N. Simpson, ADDRA, A110

~~DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED~~

DOE SIZING STUDY

Background and Assumptions

Contained in the National Defense Authorization Act for FY 1988-89 (H.R. 1748, Section 3133), is a requirement for the President to conduct a study "on the nuclear weapons complex for the purpose of determining the overall size and productive capacity necessary to meet national security objectives."

Based on the study, the President is directed to "formulate a plan....to modernize the nuclear weapons complex" including actions necessary to ensure operation of facilities....in a safe and environmentally acceptable manner; a schedule for implementation of the plan; and the estimated costs of implementation of the plan." The Act calls for submission of a report to the appropriate committees of the Congress including recommendations resulting from the study and a description of the plan. The report is to be submitted by February 15, 1988.

In contrast to the Bill, the Committee report on H.R. 1748, Section 3133, calls for both a study and a plan for the modernization of the nuclear weapons complex to be submitted by the President to the Armed Services and Appropriations Committees of the Senate and House one year later than the aforementioned report, i.e., February 15, 1989. Compared to the Bill's emphasis on recommendations concerning "the overall size and productive capacity" of the complex, the Committee report puts much greater stress on recommendations concerning the capability of the weapons complex to be operated in a "safe and environmentally acceptable manner."

Both the House Committee report and H.R. 1748 call for consultation with government and private sector experts in the course of carrying out the required activities.

The discussion which follows is based on the assumption that three distinct documents described in both H.R. 1748 and the Committee report are to be submitted by the President: (1) a study and (2) a plan to be submitted by February 1989; and (3) a report on a study and plan to be submitted by February 1988. It is further assumed that the actual FY89 budgets will ultimately reflect the priorities of two presidential administrations; further, the FY1990 budget will be the first completely new budget to be submitted by the new administration. Stated somewhat differently, the February 15, 1988 "Report" will be submitted by President Reagan, and the February 15, 1989 "Study and Plan" will be submitted by a new president.

Implications

These assumptions have several important implications for the work to be done. First, to achieve maximum influence in FY89 and FY90 policy and budget debates, greatest stress should be placed on the use of a bipartisan group of outside experts in carrying out activities required by H.R. 1748. Otherwise, the effort will add little to what has already been presented by the Administration in support of its programs, and will therefore be of little additional value in shaping the future size and character of the weapons complex.

Second, it is extremely unlikely that a bipartisan group of outside experts could be assembled if primary focus is on February 1988 rather than February 1989. If the focus is on February 1988, experts with different perspectives than those supporting the President's program are likely to view the entire effort, perhaps legitimately, as a rubber stamp exercise designed to help tip the scales in favor of the President's program (i.e. SDI/NDEW, testing, etc.) They, therefore, will refuse to be recruited for the effort. Thus, if a group of experts with a balanced bipartisan perspective is to be assembled to examine the desired size and character of the weapons complex, the primary emphasis in terms of obtaining substantive recommendations should be on February 1989 rather than February 1988.

Third, one must conclude that no new President, regardless of party and persuasion, is likely to transmit anything early in his Administration (i.e. in February 1989) which is so vitally important as the recommendations which might flow from this effort without first ensuring that his imprimatur is everywhere visible. This means that to maximize its potential contribution to future policy debates and program direction, the composition of such an expert group should primarily reflect a "mainstream" perspective which sees the complex and resulting nuclear deterrent as essential components of national security.

Finally, it is equally unlikely that an incumbent President is going to agree to appoint a bipartisan group of experts who might make substantive recommendations at variance with his own program during the remainder of his term-- if he agrees to the formation of such a group in the first place. This means that, at best, the report called for in February 1988 must steer clear of very specific conclusions about policies and programs impacting the nuclear weapons complex.

Plan of Action

In summary, the foregoing suggests the following plan of action for DOE:

1. Obtain White House approval to appoint a bipartisan but mainstream group of outside experts to carry out an examination of the overall size and productive capacity of the nuclear weapons complex necessary to support national security objectives.
2. Establish, under a designated DOE chairperson, a dedicated group of DOE, laboratory and contractor personnel to support the bipartisan group.
3. Establish a two-phase schedule for the bipartisan group which provides for an interim report in February 1988 and a final report in February 1989.

4. Define the terms of reference for the Phase 1 interim report to include a description of the existing complex and program, major uncertainties affecting future program directions, a provisional list of issues to be addressed by the group, and the format and process for issue papers to be produced for consideration by the group.

5. Define the terms of reference for the final report to include substantive recommendations on the size and productive capacity of the nuclear weapons complex including:

- o Priorities for the FY89 - FY90 Budget
- o A Proposed Legislative Package
- o Major Administrative and Management Actions

6. It is important for WRD&T to note that H.R. 1748 defines the "nuclear weapons complex" and therefore the scope of the study as "facilities for nuclear weapons research development and testing, nuclear materials production, nuclear weapons component manufacture and assembly of of nuclear weapons." Internal DP planning documentation suggests that the scope of the study be limited to WRD&T. Given the significant facility and programmatic interrelationships which exist between WRD&T and the remainder of the DP program (see points 1, 2, 3, 4, 7, 9, and 10 below) careful thought should be given to the implications of segregating WRD&T for the purposes of conducting the study. In addition, there are other Armed Services Committee and Energy and Water Committee mandated studies (e.g., New Production Reactor, Special and Laser Isotope Separation and Testing) which could lead to conflict and overlap if each is done in isolation.

A Summary of Possible Deliverables

As described above, Phase I of the study (to be completed in February 1988) should be descriptive and attempt to inventory and baseline the nuclear weapon complex as it exists today, along with all planned modifications up to and including those in the President's FY89 budget submission to the Congress. The descriptive definition should include all facets of

the complex including personnel, facilities, and other infrastructure along with attendant problems, issues, and possible events external to DOE control which could materially affect the performance and viability of the complex.

Phase 2 of the study would analyze and make recommendations on a variety of issues which are interwoven and complex. Some of these issues are discussed in summary form below:

1. Predictable Planning Baseline - No single factor is more detrimental to the overall productivity, technical, and environmental performance of the complex than the "ratcheting" which takes place as a result of rapidly and constantly changing budgetary and planning baselines. Phase 2 of the study should define specific elements and projects which should go forward against a wide range of budgetary and external conditions. At a minimum, the technology base drivers, enumerated in the FY 87 WRD&T Program Plan along with the technical disciplines required for their execution (e.g., Pu metallurgy, HE technologies, theoretical physics, hydrodynamics, materials sciences, etc.), would seem to fit in this category. These items would be sheltered from near or intermediate policy decisions regarding, for example, SDI pace and deployment, UGT limitations and arms control initiatives. The proposed approach would be a constructive departure from previous efforts which attempted to "size" the complex in response to evolving national security scenarios. Instead, a baseline program would be defined for planning purposes which is largely insensitive to the selection of such scenarios and the macro issues they raise. Proceeding this way would have the corollary benefit of not making resolution of the macro issues a requirement of this study. Every effort should be made to solicit OMB and Congressional input into the derivation of these elements.

2. Environment, Safety and Health (ES&H) - An overriding reason behind Congressional initiation of the study is concern over future ES&H performance of the weapons complex. A cleanup/preservation/restoration program plan should be defined and included as part of the baseline set forth in number 1 above. State and Federal regulatory authorities should

be included in the definition of this program and should participate in its periodic evaluation. Incremental initiatives above the baseline should parallel programmatic initiatives.

3. Special Nuclear Material (SNM) Availability - Every DP study from the Starbird Study to the FY 1990 FYPA defines SNM availability as an issue of major concern, yet Departmental plans in this area remain unclear. This is an especially crucial issue given the long lead times involved and the substantial effort which must be undertaken pursuant to NEPA before new capacity can be brought on line. It is important to tie this requirement to the baseline program in number 1 or to pending initiatives which would trigger an SNM deployment decision if such initiatives went forward. It is crucial that a clear and unambiguous interrelationship be shown between C, K, P and R reactors, the N reactor, Special Isotope Separation and the Plutonium Recovery Modification Project. In addition, recent arms control initiatives would affect weapon retirements and this also should be considered.

4. Non-Defense Programs (Non-DP) Work - Laboratory institutional plans now contemplate that Non-DP work could exceed 50% of the total funding base in the near term. Although existing institutional arrangements, both internal and external to the Department, governing the use of the laboratories are working well, it is clear that as this number grows, the difficulty in maintaining the baseline program referred to in number 1 and the ES&H effort in 2 will increase. Existing agreements with Non-DP entities should be reviewed in light of this situation and an assessment made of the strengths of the laboratories in areas other than DP programs.

5. Content vs. Pace - With respect to the DOE SDR program, it has been argued that the programmatic content would proceed without the President's SDI program and that only the pace of these efforts has been affected. In the derivation of number 1 above, it is crucial to carefully define what is in the baseline because of program content and what, if

anything, is there because of program pace. The difference is that activities driven by pace rather than content will be more subject to "ratcheting" as the budgets of DOE and DOD move up and down. In addition, activities within the complex which are geared to meeting the schedule of a particular program (e.g., SDR) can and have led to core technology programs (item 1 issue) being funded below the minimum acceptable levels (as would be defined in item 1).

6. Testing - The Department has expended considerable effort in tying the necessity of testing to the continued viability of the Stockpile, the SIP, the WDEC program and the execution of the base technology efforts. In addition, it has supported efforts to maintain some level of capability in this area, should treaty or other arrangements preclude the continuance of UGT. It is important to continue to tie the necessity of testing to more than just the production and deployment of nuclear weapons (e.g. research and development and other advanced technologies like SDR) and/or reliability of the existing stockpile, so that a moratorium in response to one concern would not limit or eliminate testing in response to others. This is especially critical in the development of surrogates for testing where their basis, in addition to energy R&D, could be support to new WRD&T technologies and the existing stockpile.

7. WRD&T vs. Production and SIP vs. New Builds - An integral part in the derivation of recommendations on issue number 1 should be the establishment of a clear Departmental policy of what is in the base for WRD&T and what is in the base for SIPs and that funds allocated for these purposes are not available, over the planning horizon, for reallocation to weapons production. While it is clear that there are events which will make it difficult to precisely sustain any particular allocation, DP should argue that such a significant event should trigger a supplemental and/or amendment. It should be noted that many other DOE programs (e.g., High Energy Physics) and institutions (e.g., SERI and Energy Technology Centers) have been able to implement and maintain such a policy over time.

8. Integration With DOD Programming Cycle - Many attempts have been made over the years to better align the DOE and DOD programming and budgeting cycles. While some success has been realized, much remains to

be done. The fundamental problem stems from vastly different deployment times from system conceptualization to IOC, and that DOD, for the most part, operates far less encumbered from ES&H restrictions than does DOE. At a minimum, the baseline program established in number 1 should reflect DOD deployment decisions which are virtually irreversible over the planning horizon. In addition, any go-ahead on a DOD system not in the base should immediately trigger a similar go-ahead for the DOE part of the program, at least in terms of budgetary approval.

9. Duality in Research and Development - Consideration of this issue might better be a part of a separate study. No issue is more sensitive or potentially more disruptive to the conduct of the overall study. In addition, fiscal and institutional considerations over the planning horizon make it unlikely that any substantive change could be made irrespective of the outcome of the analysis. It should also be noted that ES&H and other "overhead" expenses such as S&S are consuming a higher fraction of the overall DP budget. To the extent that competitive development was extended past the core technology areas, where it has demonstrated success, technical capability would, of necessity, be retarded against a wide range of budgetary scenarios.

10. Program Packaging - The WRD&T and P&S programs are characterized by technical complexity, large size in terms of dollars and facilities and varying levels of classification. Collectively these factors make it difficult to package the program in such a way that their natural constituency can be effective program advocates. Substantial advances were made with the development and issuance of the FY87 Program Plans for WRD&T and SDR where diverse programmatic elements were aggregated into the generic functions they were supporting, such as:

- o Weapons Safety
- o Weapon Control
- o Weapon Packaging
- o Tailored Outputs
- o Directed Energy
- o Weapon Understanding
- o Basic Research, and
- o Inertial Confinement Fusion

Additional effort should be expended in furthering this display mechanism, particularly in the area of facilities where often they are represented in a manner unrelated to these, or any other, specific programmatic functions.

Next Steps

As soon as possible, WRD&T should make the necessary arrangements to prepare the Phase I interim report described above. These arrangements should include:

1. Formation of an internal DOE working group to oversee and coordinate the Phase I effort, including the designation of a working group chairperson;
2. Establishing a timetable and terms of reference for the Phase I study;
3. Establishing a modus operandi for coordinating the work with DOE principals in Headquarters and field offices;
4. Designating DOE and contractor personnel to support the effort.

END

**DATE
FILMED
9/29/93**