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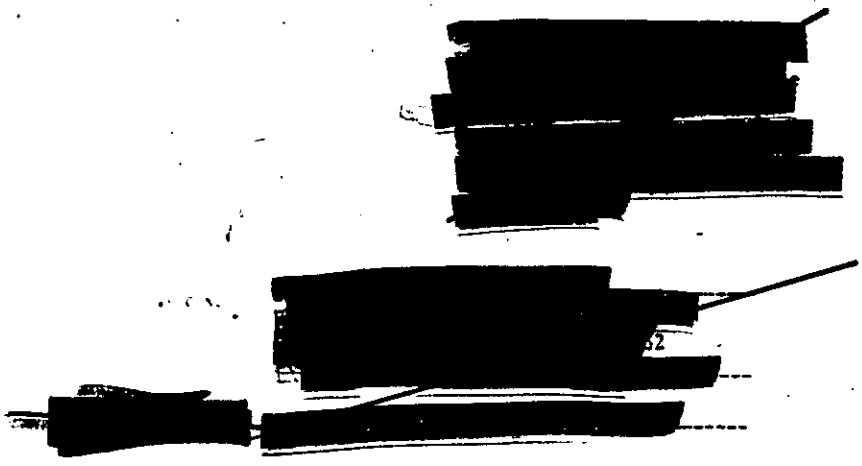
PONAST II

VOLUME I

SUMMARY

53

23 May 1973



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COMMENTS OF THE JOINT CHIEFS OF STAFF REGARDING
POST NUCLEAR ATTACK STUDY II (U)

1. (U) The Joint Chiefs of Staff have noted the subject study and consider it to be a source of useful information, subject to the cautions listed herein.

2. (NF) The study focuses on major problem areas involved in national recovery which are likely to confront national political and military leaders following a strategic nuclear exchange. In order to provide a basis for study of these areas, three hypothetical nuclear exchanges, [redacted] simulation results, were used. It is emphasized that the hypothetical exchanges and [redacted] simulation results are not themselves the focus of the study; they only provide the basis from which study of major problem areas involved in national recovery can proceed.

3. (TS) There are, consequently, important cautions which must be observed in order to avoid erroneous conclusions when using the study. For proper understanding, the study's principal observations and response to objectives, as summarized in Volume I, must be viewed in context with the assumptions and analyses contained in the detail portions of the study, Volumes II-V. The following are specific cautions:

a. To the extent that any scenario used approaches "worst case" simulation results, it is useful in sharpening the focus of problem areas involved in national recovery.

[redacted]

[redacted]

c. It was not intended that the study wargame theater wars or the tactical war at sea, assess the ultimate outcome of conflict under any scenario utilized, nor constitute a definitive statement of the damage-inflicting capabilities of the United States/USSR. The study is not a net assessment.

4. (U) The study results are useful under the 1971 scenarios specified and for the assumptions and methodology employed.

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of target systems. These factors, together with the qualitative differences (political, economic, institutional, monetary, and sociological) between the United States/USSR, determine the context within which PONAST II results can be properly considered. Care should be exercised that study findings are not employed out of this context, and access should be limited to those persons having a genuine need to know.

ENCLOSURE

OJCS DISTRIBUTION "B"

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(U) Although this JCS study involved the participation of OSD, OEP, CIA, DCPA, DIA, DCA, and State Department, with contributions from 24 other departments and agencies, it does not necessarily represent the views of the Secretary of Defense or the heads of the other participating or contributing departments and agencies.

VOLUME I

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PONAST II

EXECUTIVE SUMMARY

1. (U) Objectives. The objectives of PONAST II, which examined the effects of simulated strategic nuclear exchanges between the United States and the Soviet Union assumed to have taken place in January 1971, were: (a) to assess the capability of the US and USSR to survive, continue the conflict, and recover; (b) to provide a basis for improved US planning to enhance survivability, reconstitution, and rehabilitation in the event of nuclear war; and (c) to continue the development of the analytical procedures for this kind of study. The response to these objectives follows:

a. Capability to Survive, Continue the Conflict, and Recover. In all three scenarios considered, each country

[redacted]

National recovery would require the will to do so, and the absence of constraints such as a breakdown of government or other critical institution, or constraints due to external factors such as continuing major combat operations. Granting these conditions, recovery to preattack

[redacted]

[redacted] The times required for recovery, which are presented below, were dependent on the specific scenarios and recovery goals used in the study.

b. Improved US Planning. Significant improvements in US postattack posture following a massive nuclear exchange could be realized in the following areas:

[redacted]

(2) New Dimension Achieved in Assessing the Effects of a Nuclear Attack. Both PONAST studies exemplify the application of a new dimension in the methodology by which an in-depth analysis of the general consequences of a hypothetical nuclear exchange may be obtained. With the appropriate projection of the postattack economic activities and other long-term effects, which are possible with the applicable utilization of this new dimension of attack assessment, the resulting analysis affords a more meaningful understanding of the impact implications of a nuclear attack. This contrasts with the mere summation of the immediate postattack status of casualties and fatalities and of the physical damage to critical resources which generally has sufficed in the past. This new methodology provides a systematic analysis of the surviving capability for achieving recovery which in turn becomes

a new and meaningful assessment of the effectiveness of the attack itself.

2. (U) Utilization of Study Results. PONAST II is a comprehensive case study which involved the participation of some 31 US government departments and agencies.

A

full analysis was made of Scenario A and partial analyses, for sensitivity purposes, were made for Scenarios B and C. This case study should provide information which will be useful for improved US planning in the areas of survivability, reconstitution, and rehabilitation in the event of a nuclear attack. However, the precise numerical results, e.g. time of US and Soviet recovery, based on data inputs, must be tempered by the realities of the qualitative differences between our nation and the Soviet Union. These qualitative factors include the political, economic, institutional, monetary and psychological asymmetries existant between these two societies. The point to bear in mind is that while the results of the study accurately reflect the numerical inputs for damage and recovery, in actuality these numerical outcomes cannot be used to accurately predict the actual rate and time of recovery in the event of a nuclear war because of the great uncertainties that the qualitative factors noted above contribute to each side's capacity and will to survive, continue the conflict, and recover. Thus there may be distinct constraints on the uses of the study for other than the stated objectives. As examples: conclusions are not appropriate regarding the US/USSR strategic force balance, or regarding comparative outcomes of strategic nuclear exchanges in general. Additionally, comparison constraints arise from the following:

a. Scenario Limitations. The scenarios employed two key assumptions--first, that the [redacted] target plans (see page 2) were implemented, and second that the respective civil protection plans were carried out. The impact of these assumptions on study results were:

(2) Soviet cities were evacuated in accordance with their civil defense plans for evacuation and shelter (which the US did not have) which reduced the percent of Soviet population fatalities compared to those of the US.

b. Difficulties in Recovery Comparisons.

(1) The recovery times are a function of the recovery goals selected. Those used in the study--replacement of all military losses on a priority basis and the restoration of preattack per capita standard of living--were selected to provide a basis for testing the relative producing power of the surviving economies. They were not developed from a full-scale analysis of what the postattack military situation would require, which was beyond the scope of the study. Furthermore, although the civil recovery is stated in terms of recovery to the preattack per capita standard of living for each country, its achievement does not provide a direct measure of national economic strength, rather it reflects only that part of relative

national economic strength which the standard of living constitutes. Also, this criterion does not reflect the preattack differences in standards of living or the differences in number of survivors.

(2) As stated earlier, economic comparisons between the US and USSR are difficult because of the fundamental differences in the economic levels and in the socio-economic structures of the two countries and lack of comparability in the monetary values. Prior to the attack Soviet GNP was estimated to be about one-half that of the US, per capita consumption was about one-third that of the US, and Soviet manufacturing capacity

[redacted]

4. (U) Qualifying Comments. As in any case study, the above results are necessarily conditioned by the characteristics of the scenarios and the limitations of the assumptions. Therefore, direct comparisons of the indicated impacts on the two countries are not appropriate outside of the context of the scenario limitations. The difficulties in recovery comparisons were discussed above in paragraph 2. While keeping within these qualifications, the following comments derived from the three scenarios studied seem warranted.

a. Population and Manufacturing Residuals. The survival rates for both population and manufacturing, in all cases where they were assessed, were ____ for the Soviet Union than for the US. There was relatively less total nuclear weapon yield on Soviet urban/industrial areas and population is more widely dispersed in the USSR. Additionally, the more advanced Soviet plans for evacuation and sheltering of their population were assumed to be carried out.

c. Recovery Times. The differences in recovery times between the US and USSR reflect not only differences in manufacturing losses but also some differences in estimated lead times used for war-industry construction.

As examples, the recovery definition used does not necessarily require restoration of preattack population or GNP. Although the methodologies and data available for the determination of economic results are not sufficiently precise to provide firm quantitative comparisons between the two countries, the data and methodologies do represent the best information available and a substantial improvement over previous efforts.

[redacted]

MAJORITY POSITION

1. (U) The PONAST participants are aware of the shortcomings, large and small, inherent in inter-country comparisons made in the study. It is difficult to reconcile the basic geographic, demographic, cultural, governmental and economic asymmetries between the two societies. This dilemma is further aggravated by differences in intelligence information and data bases. Every effort has been made to enumerate factors which qualify the results and comparisons in this case study. Differences have been considered and discussed, and excursions widely made, with the findings presented fully in the report. Except for Systems Analysis, all members of the Planning Board believe the presentation of information has been properly explained and adequately safeguarded to forestall misinterpretation.

2. (U) With regard to the attacks used, these were stipulated as inputs to the study. The effort and detail which would be involved in generating major modifications to the SIOP and to the RISOP in order to conduct further excursions in addition to the interactive dynamic simulations, were beyond the scope of the study. Further, [redacted] are the most detailed and authoritative general war plans available, which were established by the Terms of Reference as a valid and reasonable point of departure for a study of this type. Also, the assumptions used in examining the effects of the evacuation and shelter programs were based on the carrying out of Soviet civil defense plans which exist, while the US had no such plans.

3. (U) The variance in standards and availability of economic information on the US and the USSR, and the other differences, which preclude full and balanced analysis, rendered

comparable measures of recovery in terms of absolute national economic strength unattainable. Fully accepted terms of absolute economic comparison between the two systems elude scholarly search even in the peacetime environment of an era of detente. Meaningful indications of general economic capability amenable to contrast, such as manufacturing capacity, were examined and set forth in order to provide whatever insights possible.

4. (U) The use of case studies for comparing the impact of a nuclear exchange on the United States and the Soviet Union was started in the 1950s, at the behest of President Eisenhower, by the Net Evaluation Subcommittee of the National Security Council chaired by ADM Radford. The necessity to improve comparability of the analytical procedures was recognized then, and in that same tradition has been the subject of great concern and effort in the conduct of both PONAST projects. Those agencies which have participated in all of these studies are fully cognizant both of the limitation of the case study approach and of the improved comparability of the results achieved.

5. (U) The analytical discipline imposed by the effort to achieve meaningful comparability has been a major contributing factor in the improvement of the case study techniques used on both sides of the analysis. Also the omission of comparative results from the study would leave the reader of the report the laborious task of collecting and sorting data from differing sections of the study in order to make his own comparisons. This could be highly frustrating and well might result in compilations of comparative data containing significant amounts of error. Furthermore, such comparisons by persons unfamiliar with the study would be unlikely to contain the proper caveats and qualifications.

6. (U) It is the majority position that continued improvement of military and economic science in this area and the search for sound public policy is best served by publication of the comparisons, despite their recognized limitations.

7. (U) In addition, the CIA emphasizes that the conclusions are misleading if represented as reflecting relative capabilities for inflicting economic damage. Both the US and the USSR are capable of inflicting more economic damage with a different target plan. Also, they stress that while the imbalance in the information available on the US and USSR preclude full analytical symmetry, the majority of participants do not believe that these shortcomings vitiate the conclusions of the study or render the international comparison meaningless.

[redacted]

VOLUME I

FOREWORD

(U) SYNOPSIS

PONAST II is the second Post Nuclear Attack Study prepared by an interagency study group in response to requests by the Joint Chiefs of Staff. PONAST II, like PONAST I (October 1968), examines both the survival and the recovery prospects of the United States and of the Soviet Union. The analyses include the potential for continued military operations following a nuclear exchange in a hypothetical general war between the US and its Allies, and the Warsaw Pact nations. The PONAST I and PONAST II wars were assumed to have taken place in the 1966 and 1971 time frames, respectively. The hypothetical nuclear exchanges used in the studies (two in PONAST I and three in PONAST II) were based on the then current [redacted] vs the [redacted]

The principle differences between the two studies grew out of two major changes: first, a substantial increase in the USSR nuclear striking power; and second, an increased US recognition of the potential of the Soviet civil protection programs. [redacted]

(U) ORGANIZATION OF THE REPORT

PONAST II is presented in five volumes, each with observations, appendices, and annexes as appropriate.

Volume I is a summary of the entire study. It also includes direct comparisons of the attack impact on the two nations and the principal observations from the study.

[redacted]

Volume II, Preattack Measures, describes the hypothetical preattack buildup, based primarily on the Joint Chiefs of Staff Exercise HIGH HEELS 1971, that was used in the two scenarios which involved a crisis escalation. This provided a rationale for identifying the location and state of readiness of military and civil personnel and resources at the time of the nuclear exchange. The scenarios were not intended to be predictive, but only to depict not-unreasonable sequences of events which could have preceded a nuclear exchange. A third case, which involved a surprise attack on the US, did not require a preattack scenario.

Volume III, National Survival, presents the results of the attacks and the survival prospects for both the US and the USSR. It covers the time period up to about six months postattack. This volume uses the past tense in presenting those attack results which are based exclusively, or primarily, on damage assessment. The subjunctive mood is used for those discussions which are deduced, or are primarily conjectural, or which clearly would occur after the survival period.

Volume IV, National Recovery, covers the analysis of the prospects for recovery for both nations and presents a "recovery plan" for each. Recovery, as defined, has two components; one relates to military strength, the other to the standard of living of the surviving civilian populations. It covers a time period from about six months postattack until recovery is achieved.

Volume V, Methodology, describes the sources, models, and analytical techniques used in this study. Emphasis is given to those innovations and substantial improvements in methodology developed and used in both the US and USSR civil analyses for this study. This volume is intended for those who may be involved in follow-on studies, and those who need specific details as to how this study was conducted.

VOLUME I

SUMMARY

PART I. INTRODUCTION

A. (U) BACKGROUND

The second Post Nuclear Attack Study (PONAST II) was initiated in April 1970 by directive* of the Joint Chiefs of Staff as a successor to PONAST I, which had been completed in 1968. The Chief of the Studies, Analysis, and Gaming Agency (SAGA) was designated as the Chairman of the PONAST Planning Board and the senior representative from the Organization of the Joint Chiefs of Staff. At the invitation of the Joint Chiefs of Staff, the Office of the Secretary of Defense (OSD); Office of Emergency Preparedness (OEP); Defense Civil Preparedness Agency (DCPA), formerly Office of Civil Defense; Defense Intelligence Agency (DIA); Central Intelligence Agency (CIA); Defense Communication Agency (DCA); and Department of State constituted the Planning Board membership. The study was produced under the general direction of the Planning Board by a Production Committee with representation from OEP, DCPA, DIA, CIA, DCA (NMCSSC), the Military Services, and the Organization of the Joint Chiefs of Staff (J-3, J-4, and J-5). The Production Committee was also chaired by SAGA. Additional contributions to the study were made, through established OEP channels, by some 24 other departments and agencies of the Federal government. Several supportive analyses were made by DCPA research contractors.

B. (U) OBJECTIVES

The objectives of PONAST II as stated in the Terms of Reference** were as follows:

• Assess the capability following a strategic nuclear exchange of the US and the USSR to survive, continue the conflict, and recover.

• Provide a basis for determining what actions could be taken to enhance survivability, reconstitution and rehabilitation of the US in the trans-attack/postattack period, placing major emphasis upon US civil/industrial reconstitution and the associated military requirements.

• Continue the development of the analytical procedures for post-nuclear attack study.

C. KEY STUDY INPUTS

1. (U) Attack Plans and Scenarios. An effort was made to model the probable course and outcome of a strategic nuclear exchange in a general war between the US and USSR, should one have occurred early in 1971. Preattack actions, including the deployment of military forces and movement of civil populations, were based on existing doctrines and capabilities of the two nations, as best they were known.

It does not represent a judgment as to the likely courses of action the USSR might select. Weapon yields and ground zeros used for damage assessment in FONAST II

were those resulting from the [redacted] simulations, which, for the Soviets, were determined by using the maximum of a range of estimated weapon yields. These damage assessments took into account the latest information on US and USSR plans and capabilities for protective measures, such as the Army Survival Measures Program and the civilian population protection capabilities, including both shelter protection and Soviet strategic evacuation. Thus, PONAST II results are considered to represent a reasonable approximation of what might well have happened had there been a nuclear war between the US and the USSR in early 1971.

b. It is axiomatic that improvements in the analytical state-of-the-art and better intelligence information would increase the confidence in the characterization of the comparative impact of a nuclear exchange. Also, had the conditions in early 1971 been significantly different, the results of the exchange would have been affected. For example, altered national policies on US strategic attack objectives would have resulted in a different [redacted] which might have directed the available US weapons to other target systems. This, in turn, could have increased the resulting damage in some target categories, at a "cost" of decreased damage to other categories. Similarly, if the Soviets were not able to evacuate much of their urban population according to their plans, their population losses would have been greater.

c. Excursions regarding alternative population evacuation and shelter conditions in the US and USSR were conducted and results reported in the study. Attack excursions using alternative targeting philosophies were not made since this was considered beyond the terms of reference for PONAST II.

d. It was assumed that after the initial nuclear exchange, no further strategic strikes on either the US or USSR occurred. However, it was not assumed that theater wars necessarily terminated with the cessation of the nuclear exchange. Although these theater wars were not simulated as a part of the study, their implications are used as appropriate in the assessment of military residuals as needed to specify the magnitude of the military and economic recovery requirements.

e. Three differing conditions of war initiation were examined in RONAST II. The principal examination was Scenario

2. (U) Preattack Conditions. The key assumptions used for Scenario A are:

c. Worldwide US military deployments, including the mobilized Reserves, were adopted from the Joint Chiefs of Staff Exercise HIGH HEELS 1971.

[redacted]

PONAST II

VOLUME I

SUMMARY

APPENDIX A

TERMS OF REFERENCE FOR PONAST II

[redacted]

VOLUME I

APPENDIX A

TERMS OF REFERENCE FOR PONAST II

A. (U) PURPOSE

To conduct a Post Nuclear Attack Study (PONAST II).

B. OBJECTIVES

1. (U) Assess the capability, following a strategic nuclear exchange, of the US and the USSR to: (1) survive; (2) continue the conflict; and (3) recover.*

2. (U) Provide a basis for determining what actions could be taken to enhance survivability, reconstitution and rehabilitation of the US in the trans-attack/postattack period, placing major emphasis upon US civil/industrial reconstitution and the associated military requirements.

3. (U) To continue the development of the analytical procedures for post-nuclear attack study.

C. GENERAL ASSUMPTIONS AND GUIDELINES

1. (U) The study will draw from PONAST I as appropriate. Where specific changes in assumptions or approach are used, or made, they will be so identified.

2. ~~(C)~~ The following specific assumption differs from PONAST I: The analysis of postattack conditions in PONAST II is limited to US/USSR, but will take into account as appropriate assumed levels of support from, and demands by, their allies.

D. (U) SCOPE

The study will address the following broad areas:

1. (U) Attack Phase. One basic game case will be played using the appropriate. This case will be a

*For definitions, see Annex A. For guideposts in assessing these terms, see Annex B.

[redacted]

The study will cover only the US/USSR civil/industrial reconstitution, survivability and rehabilitation efforts and the military requirements relating thereto.

2. ~~(C)~~ Residuals. Residuals must be examined in order to assess civil/industrial agencies insofar as population, government continuity (both municipal and national), local civil viability, production capacity and institutional capability. An analysis of non-military activities in order to determine those actions and areas requiring military support is necessary. This also will furnish a judgment for the size and effort required by the military assistance forces. Included in this analysis will be the assessment of items such as requirements and effectiveness of various civil defense measures, military support of civil authority, construction, transportation, medical services, the Command, Control, and Communication (C^3) system, reconnaissance, logistical reconstitution, population survival and will, military/industrial residuals, and national resources available.

3. ~~(C)~~ Rehabilitation. The immediate task facing a nation after a nuclear exchange becomes national survival, reconstitution and rehabilitation, while continuing any military operations essential to national survival.

In the areas of production, manpower and construction, determination will be made as to the degree to which military forces can be augmented by surviving military reserves and population. The support that reasonably can be expected from the residual and reconstituted industrial capability will be a prime consideration. Socio-economic variables such as the psychological impact of a nuclear attack must come under close scrutiny.

[redacted]

Some variants, which should be examined, are ecological and biological factors from fallout and other attack effects, population warning and shelter utilization and improvements of planning factors.

4. ~~(C)~~ Survival Enhancement. Based on the results of the study, the final report shall include comments and identify possibilities to enhance survivability, reconstitution and rehabilitation of the US in the trans-attack and postattack period and the military requirements related thereto.

ANNEX A TO

APPENDIX A

DEFINITIONS OF PONAST II OBJECTIVES

A. (U) SURVIVAL

Definition: An ability to maintain the basic physical, biological, social and economic needs so that the remaining society is able to function as a cohesive entity upon which recovery can be based and improved.

B. (U) CONTINUE THE CONFLICT

Definition: An ability to defend the US/USSR or, if required, to conduct military operations essential to national survival.

C. (U) RECOVER

Definition: The remaining society has the capability to grow toward a stable social, economic and technological state compatible with preattack values.

[redacted]

ANNEX B TO

APPENDIX A

PONAST II GUIDEPOSTS

~~(C)~~ The following guideposts will be used in order to assess the capability, following a strategic nuclear exchange, of the US and USSR to: (1) survive, (2) continue the conflict, and (3) recover:

1. Revive, redirect, and maintain production and service capabilities as necessary.

2. Provide a standard of living that is adequate for survival, perhaps austere, but, where essential requirements do not conflict furnishes goods and services which provide incentives and facilitate stabilization.

3. Maintain or expand essential government services and other institutional capabilities.

4. Support the residual military forces through the post-campaign phase.

5. Rebuild military forces and weapons systems and reconstitute the capability to support them.*

6. Expand or convert industrial capacity as required.**

*The initial test for this guidepost is the feasibility and the time required to rebuild the military to pre-war levels and composition.

**Evaluate, as feasible, reasonable tradeoffs among competitive demands.

[redacted]

[redacted]

d. A 10 percent spontaneous evacuation had occurred from US cities of over 100,000 by 5 January 1971.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

B. RECOVERY

1. (U) Approach. The analysis of US recovery is intended to ascertain whether the US could recover from a nuclear attack of this type and magnitude and, if so, how rapidly. The problem of US economic recovery is so complex that the variety of possible, even plausible, recovery plans is virtually unlimited. The question of whether the US could recover is answered by the development of a feasible plan which, when applied, is found to bring recovery. Its application also establishes an outside limit on the time required for recovery. Significant shortening of the time requirement by means of an alternative feasible plan would be unlikely because any differences would probably be within the limits of the uncertainties covered by assumptions in the recovery plan solution.

B. ON POST-NUCLEAR ATTACK ANALYSIS

1. (U) Introduction. In order to respond to the third study objective "to continue the development of the analytical procedures for post-nuclear attack study" the purpose of such analysis must first be established. This indicates the

direction that the pattern of analysis must take and provides the frame of reference for identifying progress in its development. The common purpose of the two PONASTs has been to illuminate the postattack implications of the hypothetical execution of the then current _____ attack plans. For this purpose, a pattern of analysis has emerged, improvements in analytical techniques have been developed, and the areas are identified where improvements are needed. The foregoing, together with the need for continuity of effort, are discussed in greater detail in Chapter V of Volume V, and are summarized as follows:

2. (U) Pattern of Analysis. The following discussions of the approach, scope, and participation shows how the surviving national strengths are assessed. It also sheds light on the possible role of such analysis in nuclear contingency policy development.

a. Approach. The basic approach consists of testing the capability of the residual elements of national strength to meet the national objectives. The elements tested include population, government, military forces, local viability, and production capability including manpower, physical resources, institutional fabric, and psychological state of mind. The test consists of a check as to whether any element of national strength was so weakened as to threaten forced termination as defined in PONAST I or to jeopardize the national capability to survive, continue the conflict, and recover as defined in PONAST II. To apply this test through time, it was necessary to make assumptions, especially where human behavioral responses were involved, to permit the application of quantitative test measures. This introduces a conditional and uncertain

element into the detailed prognosis of survival and recovery.

b. Scope. The significance and applicability of the findings of a study of post-nuclear attack capabilities depend in part on the scope of the analysis included. Because of the limitations of the technique employed in the post-nuclear exchange theater war gaming in PONAST I, and the omission of it altogether in PONAST II, there was little or no test of the residual opposing military capabilities beyond their comparative size. Also because of the limited exploration of the reconstituted nuclear strike capabilities in PONAST I and because the examination of follow-on strikes in PONAST II was not feasible, the residual capability following a second strike were assessed only partially or not at all. The second study added the assessment of some long term damage not directly affecting survival or recovery as defined in the study. It was not presumed, however, that this constituted the systematic assessment of those types of damage to population and resources that would contribute to a comprehensive base for evaluating any reduction in damage attributable to an armament or disarmament measure. PONAST I gave some limited attention to the attack effects on the allies of both the US and USSR, while PONAST II was confined to the analysis of the two principal powers. This left untested their postattack status relative to the other world powers. (Further, the small number of nuclear exchanges examined meant that the study results did not reflect the range of possible attack designs necessary either to support an evaluation of the targeting represented or to reflect the range of attack hazards associated with the estimated current weapon composition. Nor are they sufficient to provide an evaluation of the weapon composition.)

c. Participation. The scope and balance of topic treatment in such an extensive study as this is significantly affected by the relative participation of the various agencies involved. For example, the impact of the exchange on the relative power positions was addressed only in the first study. On the other hand, the inclusion in the second study of the examination of alternative civil protection programs and of the long range medical effects of radiation were made possible by the increased effort by DCPA in PONAST II. Also, in certain of the areas, the topical treatment was relatively more comprehensive due primarily to the greater time and effort devoted to them by experienced analysts from the contributing departments and agencies. Any move toward uniformity of treatment should be directed toward strengthening the understressed aspects of the entire effort.

3. (U) Analytical Development Achieved. There were numerous areas in which the analytical techniques used in PONAST II were more perceptive or more intensive, in ways that amounted to improvement in techniques, over those used in PONAST I. They included the following.

a. Preattack Events State of Affairs. Concepts from the _____ and, where applicable, from the preattack scenario for HIGH HEELS-71 were used to fix both the preattack location (for assessment purposes) and the state of readiness (which condition the effectiveness) of: (1) the military forces, including its command structure; (2) the President, his successors, and other primary elements of government; and (3) the population.

b. Population Impact. Increased sensitivity to the local availability and use of blast and fallout protection

was achieved on both sides, particularly for the USSR. This markedly improved the basis for comparing of results.

c. Secondary and Delayed Health Impacts. An improved technique was used to assess the threat of epidemics among survivors in sample US States and SMSAs. Also, the assessment of long-term consequences of the less-than-lethal radiation exposures to US survivors was added to the heretofor standard which was merely an assessment of the numbers of radiation casualties and fatalities.

d. Agriculture Impact. New criteria were introduced to improve the assessments of radiation effects on livestock, crops, and agricultural activity in the US.

e. Local Viability. A procedure was developed on the US side for systematically establishing a date for each SMSA when production from surviving industrial capacity therein reasonably could be assumed to become available for the national economy.

f. Facility Damage. The technique for assessing the impact on the various facility categories was improved on the US side by using "expected" values as against "cookie-cutter" values. This improvement also increased comparability with the USSR summaries.

g. Self-Generated Production. A tentative estimate was developed on the US side of the total production by sector that could be expected during the first three months postattack on the assumption of a self-direction by the plant managers.

h. Service and Control Institutions. On the US side, survival assessment, though in many cases provisional, was used for the first time for many service and economic control institutions.

i. Psychological Impact. First use was made of a modified Delphi technique to obtain consensus views of scientists and civil and military authorities concerned with nuclear attack problems on the force of various basic psychological considerations on the US side.

j. Military Recovery Requirements. For both sides, more comprehensive and systematically constructed statements were developed of the military reconstruction requirements, as defined for the study, and of the requirements for current military support throughout the recovery period.

k. Economic Capacity. For the first time, an input/output model of the Soviet economy was used in assessing its postattack production capability. Also the Soviet data base was improved.

l. Recovery Plan Formulation. A principal improvement in technique on both sides was the full structuring of plans in sector detail for meeting the explicit recovery requirements from surviving operable capacity plus that repaired or newly constructed as a part of the plan. This improved technique afforded this study a sharper contrast between the alternative scenarios examined.

m. Scenario Comparisons. Instead of generating a full analytical treatment of all alternative scenarios considered, particular subject areas pertinent to key differences among two or more scenarios were selected for comparison in terms of their implications for national survival or recovery. This avoided the necessity for a full scale treatment of any but the prime scenario.

4. (U) Preparation and Development Required. Experience from production of the two PONASTs and capabilities developed by the participants in connection with their respective nuclear

contingency preparedness obligations, suggest ways to significantly improve or expedite this line of analysis. The ones described below are divided between those which could be implemented at any time that such an analysis might be scheduled and those that would first require new developments in the state of the art, including some for which basic concepts remain to be established.

a. Presently Achievable Measures

(1) Study Ground Rules. Detailed ground rules for any future post-nuclear attack study should be developed in advance, covering at least the following: (1) delineation of the objectives, scope, and approach of the study, (2) selection of the preattack scenarios and weapon laydowns and the extent to which these can be drawn from current exercises and war simulations, (3) an adequately assessed and agreed summary of the nature, implications, and prospective execution of civil preparedness plans for the protection of the populations, and (4) the assumptions not implicit in the foregoing sources necessary to fix the location and state of readiness of the armed forces, the government, and the population at the time of the nuclear exchange.

(2) Sensitivity Analysis. Subject areas should be identified within the study for which sensitivity analysis beyond that provided by the cases selected for study could provide valuable insights. As feasible, provide for inclusion of such sensitivity analyses in the study.

(3) Current and Convenient Data Base. The following measures should be taken to assure the adequacy of the available data base.

(a) Maintain currentness of the US civil data base, including the geographical coding, all of which is now programmed except for surface transportation. The latter should be updated.

(b) Maintain in the established FORSA files more exact information for crisis management scenarios on location of US military forces and equipment, permitting an automated selection of data for any particular attack problem.

(c) Develop a procedure for rapidly preparing a sector capacity file for damage assessment reflecting DITT statements of total output for the sectors of the I-O table to be used.

(d) Develop an automated Soviet order-of-battle data base that can be processed without delay for any particular attack pattern.

(e) Develop an improved Soviet industrial data base, particularly with respect to: plant location, capacity estimates, and product identification, particularly with reference to I-O sectors.

(4) Assessment of Blast and Radiation Effects. Review, and select for use on both sides, the best substantiated and most realistic procedures and data bases for the assessment of the numbers and prognosis of blast and radiation casualties and fatalities. To the extent practicable, uniformity in analytical procedures, effects criteria, and protection characterization should be used for the adversaries, except as real differences exist or as greater and more meaningful detail is available on the US side.

(5) Local Viability Dates. Review and improve the analytical procedures on the US side for establishing local viability dates. This should include consideration for ruling out use of the hardest hit areas unless the cost of reconstruction is included in the Recovery Plan. The possibility of taking into account the impact of local viability constraints on Soviet production should be considered.

(6) Input-Output Tables. Develop the capability to use the most recent US I-O table disaggregated to a level substantially beyond that of the 1958 table used in PONAST II. Incorporate into the procedure the use of manpower skill constraints in testing the feasibility of the elements of the recovery plan.

(7) Operating Assumptions. Review and agree to the myriad assumptions involved in the construction of the recovery production plans. Particular care is required in selecting the assumptions about the definition of recovery and lead time requirements for repair and new construction in various sectors.

(8) Expedited Production Measures. In order to assure completion of any future study with substantially less time and effort than required for either PONAST, but without loss of vital analytical sensitivity, various changes in the analytical effort should be worked out in advance, including: (1) development of a precise agreed upon line of analysis, (2) Limitation of the report to a level of detail approximating that of Volume I of PONAST II, except for points of crucial difference, and (3) confining case example comparisons to the topic areas where differences are expected to be significant.

b. Long Range Development in the State of the Art

(1) Improvements are needed in the reliability and sensitivity of nuclear weapon damage functions for resources to include such factors as EMP and firespread.

(2) Development is needed for increased sensitivity in the determination of measures required for community survival in the early postattack period.

(3) Continued development of the Department of Defense Industrial Mobilization Production Planning Program, instituted to support limited war production impact analyses, would also greatly facilitate and improve the sensitivity of post-nuclear attack studies.

(4) Systematic engineering studies of the lead times appropriate for repair and new construction in both the US and USSR economies would be most useful in continuing any possible short range improvements.

(5) Successful adaptation of multi-regional input-output tables as constraints in postattack recovery analysis would improve the reliability of such analysis and provide direct insights into postattack transportation requirements.

5. (U) Continuation Effort. Any future study of post-nuclear attack impact should further improve the procedures of all contributing agencies for survival and recovery analysis and, hence, would aid those agencies in performing their functions. Also, their continued joint participation should enhance further the usefulness of the results to all concerned, as it has in the past. These responsibilities for dealing with the contingency of a nuclear exchange will continue so long as the military capability for waging nuclear war exists.