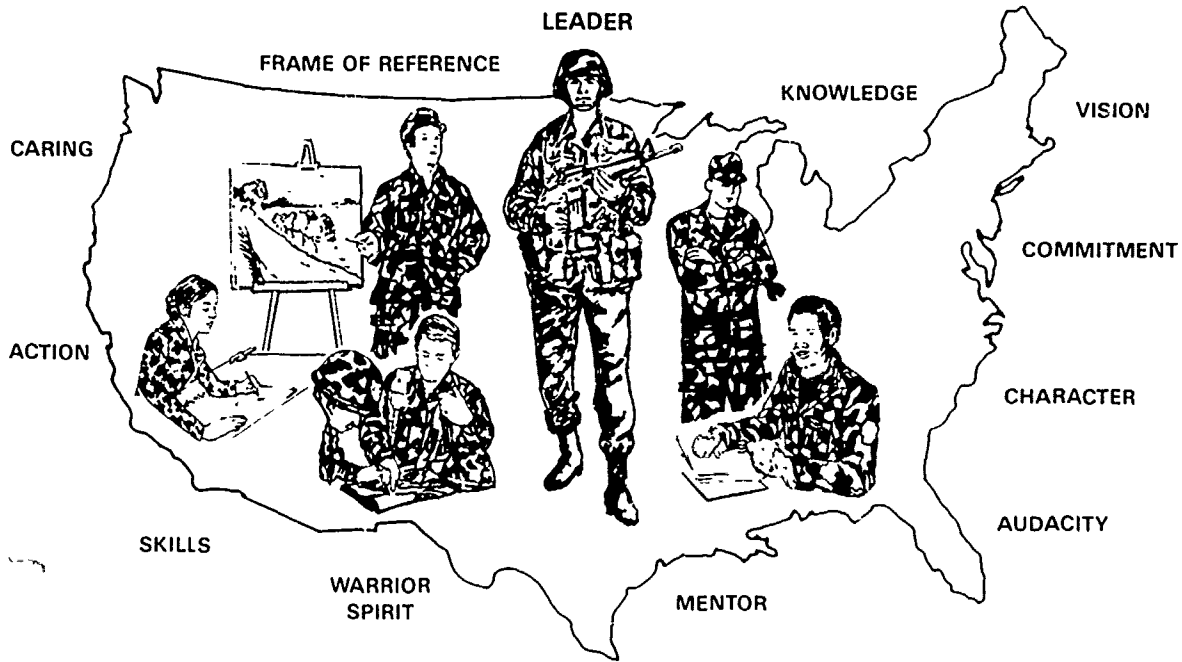


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# PROFESSIONAL DEVELOPMENT OF OFFICERS STUDY

AD-A156 360



## VOLUME V—POLICY IMPACT ANALYSIS

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The views, opinions, and/or findings contained in this report are those of the study group author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.

The words "he," "him," and "men," when used in this report represent both masculine and feminine genders unless specified otherwise.

Professional Development of Officers Study Group Report

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## Annex II

### Policy Impact Analysis For The Professional Development Of Officers Study

#### Section 1. *Futures Team Task.*

1. The Futures Team took as their task, to analyze the impact of the Officer Professional Development System (OPDS) and Professional Development of Officer Study (PDOS)-recommended policies between the years 1984 through 2025.

2. The methods used to accomplish this task included:

- a. A detailed analysis of futures literature.
- b. The creation, administration and analysis of an opinion survey on likely events and trends during the period under analysis.
- c. A detailed review of the PDOS-recommended policies.
- d. The running and analysis of computer simulations of future events and trends and their cross-impacts.

3. The resources available to the Futures Team included:

- a. DOD and Army literature which is of interest in a future tense.
- b. Individuals whose military/civilian duties are in the long-range planning and futures analysis arenas.
- c. The INTERAX computerized cross-impact program/process.

4. The Futures Team task arose from an attempt to answer some questions which principal Army decision makers would ask when conducting an a *priority* analysis of their policies—referred throughout this report as *policy impact analysis*. The questions the Team kept in mind were:

- a. Will this policy make a difference?
- b. Will this policy be useful?

c. How useful?

d. How long will this policy last before it makes no difference or actually gets in the way?

e. How much “policy management” will be required to make the policy work?

f. Will the policy make the decision maker’s responsibilities easier?

5. The analysis of the impact of policy into the future is a difficult process, at best. Typically, this process concerns itself with, only, two to three years with at most a seven year window. The process selected by the Futures Team attempted to provide a deliberate way to determine the crucial variables which would impact on the Army in the future and simulate different possible futures against which the PDOS Study Group could plan for that future and could “test” the robustness of their recommended policies through time.

6. The process which was selected can assist a leader-manager in identifying possible future environments against which his planning can take place. The process can, also, help the leader-manager visualize the effect of his policy on the system he has created—and . . . through time. This particular process (the INTERAX process) helps the decision maker to make connections which he would not ordinarily make as there is an enormous amount of data in the INTERAX model, all of which is manipulated during each computer simulation.

#### Section 2. *Futures Variables and Interactions.*

1. The INTERAX computer program requires the analyst to enter data relative to EVENTS which may/will impact on the system under analysis, the TRENDS and PERFORMANCE MEASURES which the analyst will use to monitor progress of the system through time and the CROSS-IMPACT of each event on all other

events and of each event on all the trends and performance measures. This portion of the report describes how the Futures Team got the data to enter into the INTERAX program.

2. The starting point for the Team was to read extensively in literature associated with Army long-range planning and other literature associated with the impact of the future on the current context of the world. A complete list of those sources is found at Appendix 11 of this Annex. The most significant sources were:

a. *The Army Plan (S)*: The capstone document used by Army planners and long-range planners as the foundation of their planning.

b. *The Extended Planning Annex of the Program Objective Memorandum (S)*: The document which attempts to articulate the direction of Army planning in the "out years"—years three through seven of the planning cycle.

c. *Army 21*: The Army's latest doctrine on "How the Army fights" which is authored and published by TRADOC.

d. *LOG 21*: The Army's latest doctrine on "How the Army logistically supports the battle" which is authored and published by the Logistics Center.

e. *PA 2002*: The Army DCSPER statement as to significant personnel trends which will affect Army personnel policies through the year 2002.

f. *OPMS: Look Into The Future*: The futures analysis conducted by the Officer Personnel Management Study in 1983-84. This is a definitive work on futures analysis and was the real "kick-off" for the PDOS futures study.

g. *Army Long-Range Appraisal (S)*: The guiding document for Army long-range planning authored and published by the Army's DCSOPS.

h. *The Arroyo Center's Issues Underlying Army Policy*: A guiding document for the future policy of the Army Research Institute's Arroyo Center for the foreseeable future. The document is authored and published by the Arroyo Center.

i. Documents concerned with futures analysis authored and published by the Strategic Studies Institute, the Army War College.

j. *Statistical Abstract of the United States, 1984 (104th edition)*: The National data book and guide to sources and published by the Bureau of the Census, Department of Commerce.

k. Selected documents from the Congressional Research Service.

l. *Megatrends: Ten New Directions Transforming Our Lives* by John Naisbitt.

m. The DIALOG telecommunications net which monitors technological innovations and publishes them on the network.

n. Interviews with DOD and Army long-range planners and futurists.

o. The US Air Force's *Alternative Futures Project; June, 1984*: An analysis of alternative futures for the Air Force developed by a group of respected senior Air Force leaders.

p. The report of the Review of Education and Training for Officers (RETO) study conducted in 1978.

3. Although many of the sources were classified, no event, trend, performance measure nor the associated data used during the futures process was in fact classified. Throughout the study, uncleared civilian contractors could have access to what was produced by the Futures Team. Great care was taken by Futures Team analysts to ensure that no classified information was ever used and no attempt was made to "camouflage" any data to make otherwise classified information look unclassified. People who were interviewed were asked at every step if what they were telling Futures Team analysts was classified and all notes were destroyed once unclassified final data was selected for processing.

4. The events and trends were initially divided into six categories to ensure that the data included in the futures model allowed for the creation of alternative futures relevant to the professional development of Army officers (see Appendix 1 for the final list of events and trends, and Appendix 2 for the initial list). The six initial event and trend categories were:

a. *International*: Events and trends which are driven by international forces and may or may not be in the interest of the United States.

b. *Political*: Events and trends which are driven by United States political forces.

c. *Technological*: Events and trends which cause or are the result of changes in the current state of technology throughout the world including the United States.

d. *Social*: Events and trends which cause or are the result of changes in the current state of the social environment within the United States.

e. *DOD*: Events and trends which are the result of changes under the control of the Depart-

ment of Defense, less the Department of the Army.

f. *Army (including Education)*: Events and trends which are the result of changes under the control of the Department of the Army to include training and education changes within the Army.

5. The INTERAX computer program is capable of handling data for 100 events with *cumulative probabilities of occurrence* for the 100 events over 20 intervals of time for each event. The program can, also, handle 85 trends with *trend indexes* over the same 20 intervals of time. The period of analysis was 1984 to 2025—the 20 intervals were every other year starting at January, 1984 and ending January, 2024. The final set of variables is the *cross-impacts of events on events* and of *events on trends*. Potentially, every event could impact all other events and every event could impact on all other trends. The final PDOS INTERAX model had considerably less than this amount. See Appendix 10 of this Annex for a glossary of unfamiliar terms.

6. After selecting a list of events and trends, the Futures Team sought the opinions of several people interested in the futures and long-range planning process—individuals who have duty assignments which cause them to investigate the future in some way. The opinions were gained through the following process:

a. A survey to obtain estimates of event probabilities and trend values was developed by civilian contractors working with the Futures Team and was approved by the Team.

(1) A pilot test was conducted with members of the PDOS. Corrections to the questionnaire were made.

(2) The corrected questionnaire was then administered to the “panel of experts.” A copy of the questionnaire is at Appendix 3.

b. The data from the questionnaire was analyzed by the civilian contractors and data which had the greatest divergence was put before the “panel of experts” a second time so as to attempt to achieve convergence or consensus on as much of the data as possible. At Appendix 4 is an analysis of the significant events and trends in the PDOS INTERAX model. The second iteration was conducted as a conference at which nearly all of the original panelists were present. At Appendix 5 are the final event probabilities and trend levels which were used as the initial (nominal) data in the INTERAX computer program.

7. Throughout the period of the study, Futures Team analysts studied the the data from a variety of points of view. In some cases, data from the opinion surveys were modified to conform to more enlightened information gained later in the study. Events and trends were added, others deleted or modified. If an event or trend was added, Futures Team analysts developed nominal data based on the best available, unclassified information. To be “true” to the data, follow-on work with PDOS INTERAX data should begin with a re-certification of the data by a panel of experts. This process is often referred to as a DELPHI technique.

8. The final data to be a part of the PDOS INTERAX model is the cross-impact model. The creation of this model was accomplished by Futures Team members. A description of the cross-impact model is at Appendix 6.

9. The data in the PDOS INTERAX model is made up totally of human judgment. There is nothing in the model per se which is what is traditionally referred to as objective fact. The following recapitulation of the number of decision/data points in the PDOS INTERAX model shows the extent of the subjective nature of this form of process:

- a. 1300 . . *Nominal Trend Forecasts*—(65 Trends X 20 Indexes).
- b. 1580 . . *Nominal Event Probabilities*—(79 Events X 20 Probabilities).
- c. 6162 . . *Event-on-Event Hit/Miss Determinations*—(79 Events X 78 Events).
- d. 5135 . . *Event-on-Trend Hit/Miss Determinations*—(79 Events X 65 Trends).
- e. 2275 . . *Event-on-Event Cross-Impacts*—(325 Cross-Impacts X 7 Internal Decisions).
- f. 3816 . . *Event-on-Trend Cross-Impacts*—(477 Cross-Impacts X 8 internal Decisions).
- g. 20268 . . *Total Decision Points*.

10. The final PDOS INTERAX model of events is categorized as follows (see Appendix 1 for a full discussion):

- a. *Conflict* related events (6 events).
- b. *Domestic/Internal Control* events (5 events).

c. *Environmental events* (13 events).

d. *External-to-PDOS Policy events* (23 events).

e. *PDOS-Recommended Policy events* (11 events).

f. *Non-PDOS-Recommended Professional Development Policy events* (7 events).

11. The final PDOS INTERAX model of trends is categorized as follows (see Appendix 1 for a full discussion):

a. PDOS System-Wide Issues (8 trends).

b. PDOS Performance Measures (12 trends).

c. PDOS Performance Indicators (12 trends).

d. PDOS Performance Indicators on spreadsheets programs (18 trends).

e. Other trends.

12. A cross-impact of an event on another event or trend has the effect of setting-up, before computer simulations are run, the opportunity for an alteration of the original (also referred to as "nominal") data within the computer. The alteration of the data will occur only if the first event of the pair in a cross-impact actually occurs in a simulation. The first variable of the pair in a cross-impact is referred to as the "impacting event." It is always an event—never a trend. A trend which gives the appearance of impacting on another variable is actually a specific and discrete event which is interpolated from the trend line for a specific point in time. The second variable of the pair in a cross-impact is referred to as the "impacted event or trend." This variable can be either an event or a trend.

13. The cross-impact of an event on another event has the effect of increasing or decreasing the probability of the occurrence of the impacted event should the impacting event actually occur in a computer simulation. The cross-impact of an event on a trend has the effect of increasing or decreasing the level of the trend line should the impacting event actually occur in a computer simulation.

14. It is also possible to build into the model a sense of "expectation" which people hold about the occurrence of some events. As an example, one can visualize that the occurrence of a pay raise (an event) would have a positive affect on Army esprit de corps (a trend). That same event, were it expected to occur but at the last minute did not—the Administration were to freeze all

pay raises—the effect could actually lower esprit de corps. This effect can be "built" into the model, a priori. When the preponderance of cross-impacts are "expected value" cross-impacts, the model is referred to as an "expected value model." Cross-impacting events which do not occur and also do not have this reverse effect on impacted events or trends are "baseline cross-impacts." When the preponderance of cross-impacts are "baseline" cross-impacts, the model is referred to as a "baseline model." The Futures Team experimented with both kinds of models. This experimentation caused the Team to completely rebuild the cross-impact model three times. The final model used was a "baseline model" and it is the best representation of the world which was created by the Team throughout the entire project.

### Section 3. Computer Simulations

1. Computer simulations using INTERAX can produce two distinct types of information for the decision maker. The simulations can create:

a. *Single scenarios* against which a decision maker can conduct detailed long-range planning. A scenario shows the decision maker a possible alternative future which may confront his organization. The terms "scenario" and "alternative future" may be used interchangeably. The Futures Team analyzed ten scenarios, selected three for in depth analysis and provided them to the rest of the PDOS study group (see Appendix 7 for details).

b. *Multiple (or composite) scenarios* against which potential policies can be "tested." These scenarios show the decision maker the maximum, minimum and average effect which his policies may have on his organization. The Futures Team analyzed, in depth, four scenarios across eight trends and provided the data to the PDOS Study Director and to the Vice Chief of Staff, Army.

2. Although this information was detailed and plausible, it should be noted that no policy decisions were rendered by the PDOS Study Group as a result of this analysis. This "none use" can be attributed to three factors:

a. The data which results from the INTERAX process should all have been ready before the PDOS study began. *This project cannot run in parallel with a planning project.* It should precede it. Two of the three contractors assisting the Futures Team suggested, early in the project, that the INTERAX project would not achieve the desired results because of this. In retrospect, the

current version of the PDOS model may offer its greatest utility in providing key decision makers with a decision support system or "navigation" tool which will help the decision maker overtime as the Army proceeds towards the desired system state.

b. Study group members should be educated in detail as to how to use the INTERAX process. This was attempted, however it came at the wrong time—when the study was well underway and the future of the professional development of officers and its attended policies were in a draft stage. Basically, there was a lack of commitment on the part of key members of the Study Group to use the INTERAX process and the results except to comment on the general performance of "policy packages" simulated over time.

c. The decisions in the INTERAX model lacked credibility with its audience. As was pointed out above, there are 20,268 subjective decisions in the PDOS INTERAX model. A decision maker using this process *must* agree with those decisions before he will use the results of the process. Most of those 20,268 subjective decisions were generated or modified by two lieutenant colonels from the best available information and their own personal experiences with how the world is tied together. The Vice Chief of Staff's comments are appropriate, here—"When you compare *my* years of experience with *yours*, who do you think is going to win?" The problem is not the process nor even the decisions made by the two lieutenant colonels. The issue is in the need to determine from the key decision makers on whom they will rely to make the 20,000 subjective decisions—it is unlikely that they will spend the time to make these decisions themselves. To overcome this difficulty, the PDOS group is seeking to turn over the PDOS INTERAX model and its data to the Strategic Studies Institute of the Army War College so that this agency can "mature" the data and set up a policy impact exercise for new brigadier generals. It is felt that this group can pass useful judgments and make worthwhile recommendations to the senior Army leadership on the future implications of professional development policies.

3. Throughout the entire operation, the Futures Team had to experiment with the entire INTERAX process. This work had never been done by any agency of the Department of the Army. Although there were three contractors assisting in the project, none of them was fully knowledgeable in the process nor the kind of data which was finally produced. In some cases, in-

formation among the contractors conflicted. In fact, it was not clear until the final week of the project precisely what was needed to make the process actually model the "reality" which a key Army decision maker would want to use.

This portion of the report addresses the two computer simulation techniques used by the Futures Team.

4. *Single Scenario Computer Simulations:* See Appendix 7 for a complete description of this technique.

5. *Multiple (or composite) scenarios:*

a. Nine multiple scenarios were run for the final data which were presented to the Study Director and the Vice Chief of Staff. As a result of these two meetings, further work was done to improve on the quality of the data in the model and the final product which was prepared for the Chief of Staff's decision briefing. (See Appendix 9 for a copy of the Futures Team briefing. This briefing served as the outline for this Annex.)

b. Each of the nine multiple scenarios was a composite of 25 alternative futures—this was a total of 225 alternative futures. The nine simulations were separate "stories" about the future which a decision maker could encounter. Four of the simulations were "runs" *without* PDOS-recommended policies and four simulations *were* "runs" with PDOS-recommended policies. This was done to show the analyst and the decision maker what would happen to officer professional development when left "unmanaged" and what the effect would be with PDOS-recommended policies. One run was a "statistical run" used to verify the internal consistency of the data in the PDOS INTERAX model. The four scenarios were:

(1) A "World-With-Wars" simulation in which a variety of forms of conflict were permitted to occur at specific times. See below for the forms of conflict and the years of occurrence.

(2) A "Domestic/Internal Control" simulation in which the Army received a variety of "protection" or "police" missions.

(3) An "International/Domestic Tranquility" simulation in which the Army had no war nor domestic control missions.

(4) A "Free-Play" simulation in which all events were allowed to occur at random (except those professional development policies events which were not being considered by the Study Group).

c. The details of each simulation follow:

(1) A "World-With-Wars" simulation: All of the "conflict" events were forced to occur in the years indicated:

- 1986: E-15—US In Low-Intensity Conventional War.
- 1990: E-58—US Protects Foreign Supplier.
- 1995: E-13—US In Mid-/Hi-Intensity Conventional War.

<i>Start Suppress</i>	<i>Lift Suppress</i>	<i>Start Suppress</i>	<i>Lift Suppress</i>	<i>Start Suppress</i>
1984	1995	1998	2015	2018
1984	1995	1998	2015	2018

(b) This scenario included some events which would not occur during a prolonged (2 + years) armed conflict for which there would be "popular" and Congressional support (e.g., reduction in the budget for spare parts and ammunition and a great reduction in the Defense budget). The Futures Team made the assumption that there was "popular" and Congressional sup-

<i>Start Suppress</i>	<i>Lift Suppress</i>	<i>Start Suppress</i>	<i>Lift Suppress</i>
1995	1998	2015	2017
1995	1998	2015	2017
1995	1998	2015	2017

(c) All "Domestic/Internal Control" and "Other Officer Professional Development System Policy" events were suppressed (not allowed to occur) throughout this simulation.

(d) All other events in this simulation were free to occur as the monte carlo technique in the program would permit.

(2) A "Domestic/Internal Control" simulation: All domestic and internal control events were forced to occur in the years indicated:

- 1990: E-9—Army To Control Riots.
- 1990: E-80—Wide-Spread Riots.
- 1992: E-49—Army Patrols Mexico/US Border.
- 1995: E-35—Mexico Turns Communist.
- 1995: E-66—Army Protects Domestic Facilities/Services.

- 1996: E-11—Reserves Mobilized.
- 2015: E-16—US In Bio/Chem War.
- 2015: E-8—Unauthorized Nuclear Launch.

(a) Two events in this scenario would appear only during times when the Army would experience rapid increases in officer personnel due to an armed conflict. These events were forced to not occur ("start suppress") or to occur ("lift suppress") as indicated:

- E-97—Reduction In Expert-Integrator "Grooming" Due To Armed Conflict.
- E-99—Large Increase In Officer Promotions Due To Armed Conflict.

port for the armed conflicts which would develop in the scenarios. Popular and Congressional support for the conflicts has the effect of permitting several other events to occur and causes several trends to shift in directions which would not be possible without that support. Those events which were manipulated in the scenarios were:

- E-87—DOD Budget Greatly Cut.
- E-89—Live Ammunition Use Reduced.
- E-90—Spare Parts Reduced.

(a) All "War Related" and "Other OPDS Related Policy" events were suppressed throughout this simulation.

(b) All other events in this simulation were free to occur as the monte carlo technique in the program would permit.

(3) An "International/Domestic Tranquility" simulation: All conflict related, domestic/internal control and other OPDS related policy events were suppressed throughout this simulation. All other events in this simulation were free to occur as the monte carlo technique in the program would permit.

(4) A "free-play" simulation: Only other OPDS related policy events were suppressed throughout this simulation. All other events in this simulation were free to occur as the monte carlo technique in the program would permit.

d. The PDOS Study Group developed over 100 policies throughout the study. The Futures Team analyzed these policies in order to develop policy events and cross-impacts for computer simulation. The Futures Team aggregated all the policies into 11 broad categories which could be manipulated in the PDOS INTERAX model. Each of these broad categories had a set of cumulative nominal probabilities of occurrence over the next 40 years and were cross-impacted throughout the model. In each of the four "policy" simulations, the policies were forced to occur as follows:

(1) In 1987:

(a) Event-70: ELECTRONIC WARGAMES—Army fields staff-oriented, electronic wargames for training.

(b) Event-82: COMMON CORE SKILLS ESTABLISHED—Army establishes a "road map" of common core skills for each Development Period. The package of common core skills, which is added to the MQS program, includes skills which lead to the mastery of the art and science of war. These skills are:

(1) Theoretical knowledge and practical skills/proficiencies at each level of responsibility throughout the Army.

(2) The knowledge of the human dimension of combat.

(3) An historical perspective of war.

(4) The ability to envision future war.

(c) Event-83: FORMALIZED PROFESSIONAL DEVELOPMENT PROGRAM ESTABLISHED—Army establishes a formalized officer professional development program at all TOE and TDA units and organizations. The execution of the program is decentralized to the units and organizations but includes as a minimum, professional development in the following:

(1) Professional Values.

(2) Warrior Spirit.

(3) Leader-Mentor Roles/Relationships.

(4) Self-Development.

(5) Art and Science of War.

(6) Common Shared Operational Language.

(7) Expert-Integrator Roles/Relationships.

(8) Decision Making and Conceptual Skills.

(d) Event-85: WARRIOR SPIRIT PROGRAM ESTABLISHED—Army establishes a program to instill the warrior spirit throughout the entire Army which includes:

(1) Officer knowledge of the "threat."

(2) More physically and stressfully demanding training.

(3) Annual qualification with a basic weapon (results recorded on the OER).

(4) Officer knowledge of "practical terrain sense."

(5) Officer knowledge of basic tactical doctrine and employment of common individual and crew-served weapons.

(2) In 1988: Event-84: REQUIRED SCHOOL EXPERIENCE—Army establishes policy requiring officers to complete schooling as follows: All lieutenants to attend resident OBC prior to first assignment, all captains to attend resident OAC and resident CAS3 (basic assumption: This policy will add approximately 450 man-years—18% increase—to the CPT THS account in any given year), all majors to attend a CSC (no appreciable increase in THS account is anticipated as completion of CSC-level schooling may be accomplished by correspondence) and all colonels to attend an SSC (no appreciable increase in THS account is anticipated as completion of SSC-level schooling may be accomplished by correspondence).

(3) In 1989:

(a) Event-33: ARMY ESTABLISHES ENTRANCE REQUIREMENTS—Army establishes minimum entrance requirements for officers such that cadets and candidates must achieve a pre-established score on a battery of tests prior to commissioning.

(b) Event-48: SELF-ASSESSMENT TESTING—Army establishes a policy which includes self-assessment testing as part of resident education from captain through general officer.

(c) Event-53: COMPETENCY TESTS ESTABLISHED—Competency tests are established as a prerequisite for schooling at the next Development Period through Development Period 3.

(4) In 1990:

(a) Event-3: MILITARY QUALIFICATION STANDARDS TEST ESTABLISHED—Army officers (O1 to O5) are required to take some form of periodic military qualification standards tests to validate their knowledge of one or a combination of the following: Branch, Functional Area, Area of Concentration and/or Skill. TRADOC has developed and distributed to all

officers (O1 to O5) Military Qualification Standards (MQS) materials.

(b) Event-46: ARMY INSTALLS EXTENSIVE COMPUTER BASED INSTRUCTION PROGRAM—Army installs an extensive computer based instruction (CBI) system using, e.g., MicroTICCIT. A portion (10%) of Army resident and non-resident officer instruction is conducted by CBI which includes the interactive imparting of knowledge and information by computer assisted instruction (CAI) and the management of the administration of training and education for the staff and faculty by computer managed instruction (CMI). (This is the PDOS-recommended policy concerning "Education and Training Methodologies.")

(5) In 1991: Event-47: ARMY ESTABLISHES ASSESSMENT CENTERS—Army establishes assessment centers in conjunction with resident schools or installation-level learning centers designed to assess level of individual officers (O1s through O6s) as to their professional development. The assessment centers evaluate officer: Potential, knowledge, personality traits and attitudes, interests, aptitudes (e.g., integrative skills) motivation and stress adaptation, physical fitness and skills.

e. Computer simulations were "run" against all 65 trends in the PDOS INTERAX model, however the results of only eight trends were analyzed in any detail. The results of these simulations are found in Appendix 8 in graph form. Those trends were what became to be known as "PDOS System-Wide Issues." Each of the eight trends were considered as "index" trends, meaning that they had a nominal value of "1.00" throughout all of the 40 years of the PDOS INTERAX model. An index trend allows the analyst to enter a subjective trend into the model. Were an objective value ever found for the subject trend, the objective value could be multiplied by the value in the INTERAX model giving the analyst a more useful representation of the value through time. Each of the index trends was cross-impacted by events, as appropriate, and were allowed to be impacted throughout all computer simulations. Descriptions of these trends are:

(1) Trend-68: PROFESSIONAL VALUES—Level of officer adherence affectively and behaviorally to the complex set of professional values described in the "PDOS System-Wide Transition Period" literature: briefly—officers accept the responsibility for protecting the Nation; they internalize and display the values of integrity, selflessness, honesty, special trust, loy-

alty, care for soldiers and their families, excellence in performance of all duties; they establish a command climate which produces initiative, trust and mentorship.

(2) Trend-69: WARRIOR SPIRIT—Level of officer adherence to the state-of-mind and preparedness that blends all the physical, mental and moral qualities essential for an officer to successfully lead the Army in its mission of protecting the Nation. Officers accept the responsibility of being entrusted with the protection of the Nation; are prepared physically and mentally to lead units to fight and support in combat; are skilled in the use of weapons, organizations and tactics; inspire confidence and an eagerness to be part of a team; has the ability to analyze and the boldness to take action to accomplish the mission.

(3) Trend-70: LEADER-MENTOR — Level of the amount of time officers have to develop a style of leadership which facilitates the growth and development of subordinates by educating, socializing and training subordinates and by being for those subordinates a role model, a teacher, a coach, an advisor and a guide.

(4) Trend-71: DECISION MAKING SKILLS — Level of officer ability to use analytical and conceptual skills necessary to establish goals and objectives, identify problems, develop alternatives, evaluate alternatives, choose an alternative, implement, control and evaluate decisions.

(5) Trend-75: ART & SCIENCE OF WAR—Level of officer adherence to the principles of and knowledge of the art and science of war which includes:

(a) Theoretical knowledge and practical skills/proficiencies for each Development Period.

(b) Knowledge of the human dimension of combat.

(c) An historical perspective of war.

(d) The ability to envision the future war.

(6) Trend-76: EXPERT - INTEGRATOR—*Expert*: Level of officer in-depth knowledge and capabilities in a single branch, functional area and/or area of concentration the major contribution of which is within a specifically defined area. *Integrator*: Level of officer knowledge and capabilities in one or more branches, functional areas and/or areas of concentration and ability to analyze, synthesize, conceptualize and/or use decision making skills to achieve synergistic results affecting multiple areas.



(7) Trend-80: COMMON SHARED OPERATIONAL LANGUAGE—Level of officer proficiency in the skills associated with using a common military operational language.

(8) Trend-81: SELF-DEVELOPMENT—Level of officer acceptance of primary responsibility to progressively grow and learn, both the profession of arms and his/her functional specialty(ies).

**Section 4. Policy Insights.** As was discussed in Section 3, paragraphs 5 a and b, two multiple scenarios (25 scenarios each) were run against each of the four environments depicted above. One of these scenarios was *without* PDOS-recommended policies and the other was run *with* PDOS-recommended policies. The effects created in these simulations are discussed in this section. A series of graphs which show these effects is in Appendix 8. Graphs from the Final Set of Simulations, and are repeated in Appendix 9. Futures Team Briefing. Figure II-1 is one of these graphs and is presented here to assist the reader in visualizing what an effect looks like and to provide a flavor of the INTERAX product.

1. Art and Science of War: This trend or system-wide issue is the center piece of the entire PDOS study. The data indicate that when Art and Science of War is left to “grow and mature” under current policies and in the absence of PDOS-recommended policies the trend will gradually improve in the “free-play” world, will improve only as a result of war in the “world-with-wars” world and will experience a decline from its present status in the “internal control” and “tranquillity” worlds. When PDOS-recommended policies are added to the computer simulations, the improvements in this trend are dramatic and in all cases experience a steady improvement. Figure II-1 shows the results of the simulations for Art and Science of War. The upper series of graphs shows the four worlds without policies and the lower series shows the four worlds with policies.

a. Along the y-axis of a given graph is the relative level of the trend with “1.00” being the value for 1985.

b. Along the x-axis are the years of the simulation (1985-2025).

c. The upper line is the line of maximum values throughout the simulations (note: no single scenario traces any one of the lines—this is a line of “peaks” for all scenarios).

d. The middle line is the line of average values throughout the simulations.

e. The bottom line is the line of minimum values throughout the simulations.

2. Warrior Spirit: This trend or system-wide issue receives very limited impact in the absence of PDOS-recommended policies. This seems to track correctly with the current state of the nature of the warrior spirit concept. The initiation of the PDOS-recommended policies on warrior spirit sees improvement in all worlds with the greatest impact being felt during times of conflict.

3. Self-Development: This trend sees the institution of a professional value throughout the officer corps. In the absence of PDOS-recommended policies, this “officer corps-wide” value is virtually unknown. With the initiation of PDOS-recommended policies, self-development is allowed to become an “officer corps-wide” value. The effect of this cluster of policies is virtually the same throughout all simulated worlds—immediate and positive.

4. Leader-Mentor: This trend deals with the amount of time available for leaders to develop their subordinates under the philosophy associated with this system-wide issue. In the absence of PDOS-recommended policies, this trend sees little movement from its present state. The only times that this trend fluctuates positively is in the presence of armed conflict—and then, only slightly. In the presence of PDOS-recommended policies, this trend experiences dramatic shifts during times of conflict and only slight improvement during the “internal control” and the “tranquillity” worlds.

5. Expert-Integrator: This system-wide issue is closely associated with “Art and Science of War” in that the policies cross-impacting both are quite similar. The events which cross-impact these two trends are nearly identical, with some exceptions. The results with PDOS-recommended policies are, also, similar.

6. Decision Making Skills: This system-wide issue is dependent, predominantly, on technological advances which are forecast to become available after the year 2000 unless PDOS-recommended policies are instituted. In fact, in the absence of these policies, no improvement worth discussing is evident. With PDOS-recommended policies, dramatic improvement in this trend is “felt” almost immediately.

7. Common Shared Operational Language: This system-wide issue has no current policies which cause it to “improve.” In fact, in the absence of PDOS-recommended policies, this trend sees a steady decline over all simulated “worlds”

# ART AND SCIENCE OF WAR

--Level of officer adherence to the principles of art and science of war which includes:

- a. Theoretical knowledge and practical skills/proficiencies for each Transition Period.
- b. Knowledge of the human dimension of combat.
- c. An historical perspective of war.
- d. The ability to envision the future war.

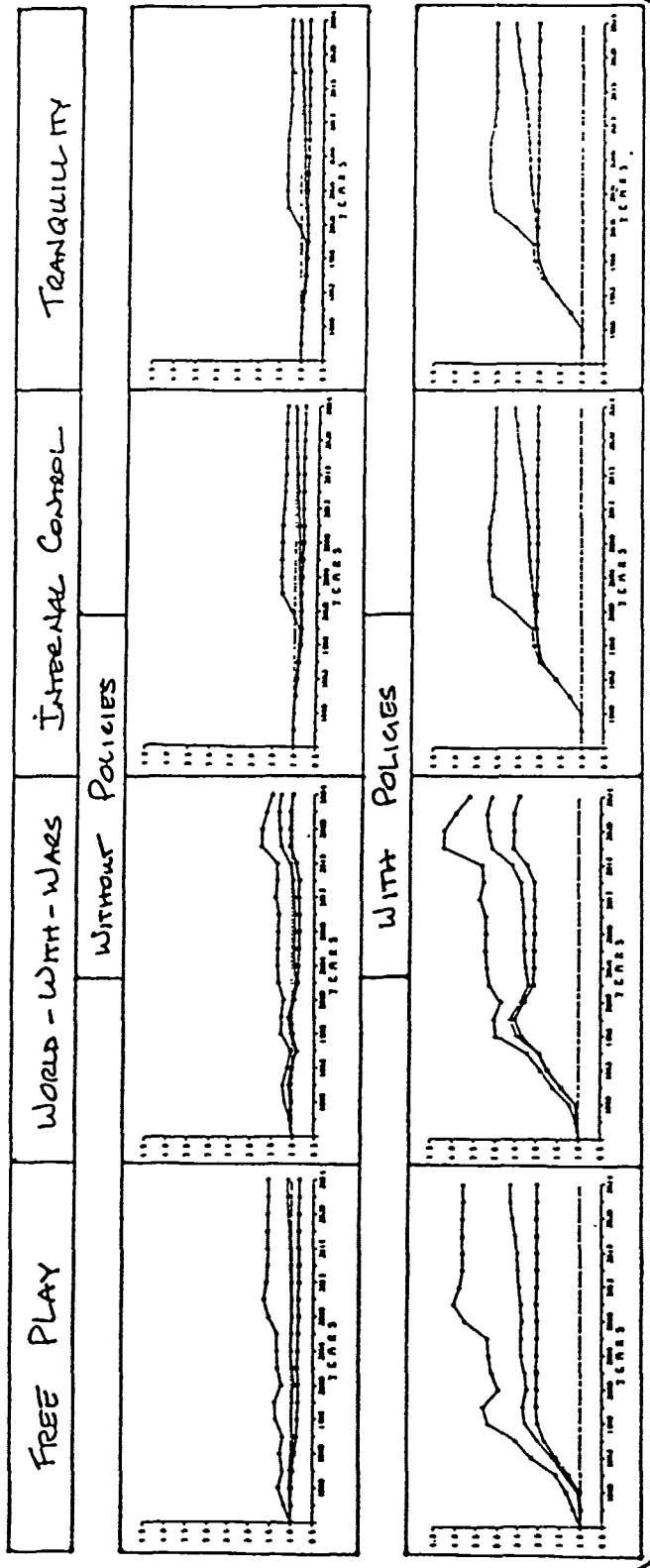


Figure II-1: Art and Science of War.

with only slight improvement during times of conflict. Once conflict is over, the trend returns to its depressed state. In the presence of PDOS-recommended policies, the trend does improve, with significant improvement during armed conflict.

8. Professional Values: This system-wide issue sees virtually no improvement nor decline in any of the "without policy" simulations. With the implementation of PDOS-recommended policies, this trend "experiences" immediate and dramatic improvement.

**Section 5. Policy Recommendations.** After computer simulations were "run," policy recommendations were made by the Futures Team to the Study Director and were also made to the Vice Chief of Staff during an In-Process Review. The recommendations were:

1. Once policies are installed, they need to be continuously monitored by the ARSTAF. Intensive decentralized and "self" management were intentionally built into the model. For the actual or "real world" results to mirror the simulated results, this form of management must be part of any a professional development program.

2. The MQS Testing and CCBI packages of policies seem to be the most powerful and long lasting under varied scenarios. This seems to "track" with "real world" expectations. Individuals tend to do best at things for which they are held accountable and for which they are evaluated. These policies should be executed.

3. The "assessment strategy" is the next most powerful set of policies. Initiatives should be undertaken or continued to see this set of policies installed.

**Section 6. Methodology Insights.**

1. This entire process is in its infancy. It was untried by the Army prior to the PDOS Study. There is little in the futures literature to indicate that it has been successfully used in industry or academe. The Futures Team found no refereed journal articles which have evaluated the INTERAX process.

2. This study was undertaken under the assumption that there exists no way to manage uncertainty nor account for all of the possible variables which may emerge during the 40 years under study.

3. This portion of this report seeks to address the positive and negative aspects of the INTERAX method of cross-impact analysis and policy impact analysis.

a. Positive aspects:

(1) INTERAX provides the analyst with an aid in organizing his thinking. The model holds a large amount of data which could not be handled without the aid of a computer. INTERAX can conceivably hold in its memory and can manipulate the following subjective decisions:

	<i>Subjective Decisions</i>
(a) Probability Estimates of 100 Events Over 20 Periods of Time:	2000
(b) Forecasts of Trend Level of 85 Trends Over 20 Periods of Time:	1700
(c) Event-on-Event Hit/Miss Determinations (100 Events X 99 Events):	9900
(d) Event-on-Trend Hit/Miss Determinations (100 Events X 85 Trends):	8500
(e) Maximum Allowable Cross-Impacts Is 3000 and can be either Event-on-Event or Event-on-Trend. Conceptually, There 9900 Event-on-Event Cross-Impacts (100 Events X 99 Events) and 8500 Event-on-Trend Cross-Impacts (100 Events X 85 Trends). 3000 Allowable Cross-Impacts X 8 Decisions:	<u>24000</u>
(f) Subjective decisions possible:	<u>46100</u>

There were 20268 subjective decisions made to create the PDOS INTERAX model—8971 are retained in the memory of the program and 11297 decisions are retained "off line" of the program. It is also possible to integrate "objective" data with subjective data. Actually, this tends to model the decision making strategies of anyone—one combines objective and subjective data together when making decisions of whatever magnitude.

(2) The print-outs provided from INTER-

AX provide a large amount of data for the analyst. The program can also be run interactively from year to year during a single scenario simulation.

(3) This process helps the decision maker to manage what he can hypothesize about the future, helps him to provide consistency to his decisions and helps him to overcome the human frailty of holding only a small amount of information in the short-term memory of his brain.

b. Negative aspects:

(1) The INTERAX model is somewhat cumbersome. It is difficult to get information into the program. It is difficult to manipulate data once in the program. It is difficult to process the data from the computer print-outs. It is difficult to have decision makers "believe" the analysis (although this is certainly a function of the quality of the analysis performed, the data base placed in the INTERAX model by those analysts and how the decision maker feels about the qualifications of those making the subjective cross-impact decisions).

(2) Information from two of the three consultants who assisted the Futures Team indicated that a futures project in the private sector using INTERAX will take in excess of two years to complete! As a side-light, the cost to the consumer of these projects is approximately \$200,000 to \$300,000!

(3) The analyst has a large amount of start-up time to spend before one piece of alternative future information can be obtained from the model. There are no accurate data on start-up times; however, the Futures Team estimates that approximately six months for a two person analyst cell would be a *conservative* estimate.

(4) The INTERAX process is labor-intensive. There are no short-cuts to creating plausible results. The information that comes from the INTERAX is only as good as the data which goes into it. What would seem to be a simple change to the data can, conceivably, take two weeks of 14 to 16 hour days to modify the data in the model, run scenarios and analyze the results to accommodate the "simple" change. This is *not* an exaggeration.

(5) Decision makers wishing to start a cross-impact/policy impact analysis project using INTERAX are recommended to know precisely what will result from the amount of effort which will be expended and for what purposes they intend to use the output. The cost in labor and capital is too great to proceed blindly.

### Section 7. Methodology Recommendations.

1. The central/strategic short-coming with the PDOS INTERAX model is found in the fact that this model was created virtually by people not involved in making decisions about officer professional development. Of the 20,268 subjective decisions in the model, not one was made by a key decision maker. As a result, the information which the Futures Team generated, although consistent and based on conscientious work by two experienced officers, it lacked credibility and the

results of the analysis were not used in making professional development decisions.

2. This strategic short-coming can be overcome, but at some expense. The decision maker who will rely on the INTERAX data must do one of three things:

- a. Agree that the data in the model is acceptable to use for long range planning
- b. Develop the data himself, or
- c. Have the data developed by those upon whose judgment he will rely.

The PDOS INTERAX model did not have any data in it which came from key Army decision makers. ARSTAF principals, the Vice Chief of Staff and the Chief of Staff should all be part of the "building" of the INTERAX model, if they are the target audience of the results. Not doing this will probably result in a marginal return on the investment.

3. The software in the INTERAX is cumbersome. The computer print-outs are all numbers with no graphs to assist an analyst. This makes processing data very slow and tedious. A graphics package in the main-frame computer where the INTERAX program was stored was used in the final product which was a vast improvement over former ways of doing things. However, even this program was not as responsive as an analyst would want. A set of graphs from a single scenario or statistics run could take in excess of four to eight hours to produce! That equates to one to two weeks to produce graphs for the nine simulations run in the final iteration.

4. The documentation for the INTERAX is deficient in the details needed to conduct good analysis. The PDOS Futures Team is currently improving the user's manual in order to make it available to subsequent military users.

### Appendixes:

- 1—Final List of Events and Trends.
- 2—Initial List of Events and Trends.
- 3—DELPHI Questionnaire.
- 4—Significant Events and Trends in PDOS INTERAX Model.
- 5—Analysis of Events and Trends Entered into the INTERAX.
- 6—Description of the Final PDOS INTERAX Data base.
- 7—Examples of How to Conduct Alternative Futures Analysis and Policy Impact Analysis Using the INTERAX Process.
- 8—Graphs from the Final Set of Simulations.
- 9—Futures Team Briefing.
- 10—Glossary.
- 11—Bibliography.

Authors: LTC Stout/LTC Russell  
Team Chief: COL Dunn

## **Appendix 1 to Annex II**

### **Final List of Events and Trends**

1. **PURPOSE.** To present the final list of events and trends in the PDOS INTERAX model.

2. **Discussion.** Attached as Tab A is the complete list of events and trends along with a recapitulation of the PDOS INTERAX model and the policy impact analysis using computer simulations.

Tab A — Events, Recommended Policies, Trends and PDOS System-Wide Performance Measures in the PDOS-Interax Model

# **Tab A To Appendix 1**

## **Professional Development Of Officers Study (PDOS)**

### **Futures Team**

Office, Chief of Staff, Army  
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Washington, D.C. 20310-0200

**EVENTS, RECOMMENDED POLICIES,  
TRENDS AND PDOS SYSTEM-WIDE  
PERFORMANCE MEASURES  
IN THE PDOS-INTERAX MODEL**

17 December 1984

Recommendations For The Improvement Of This List Are Strongly Encouraged By The Professional Development of Officers Study - Futures Team. Recommendations May Be Forwarded To LTCs Carolyn Russell Or Carl Stout At (AVN) 227-6538/6550/6559 or (CML) (202) 697-6538/6550/6559.

Professional Development Of Officers Study Group Report

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# Events

## In The INTERAX Model

Following each description of the event is a parenthetical comment written as, e.g., "(1 OI)," which means the "order of impact" on the Officer Professional Development System (OPDS). A 1st order impact describes a direct cause-effect relationship (e.g., a measure of performance of OPDS); a 2d order impact describes a cause-effect relationship which must pass through one other actor in the military environment before it reaches the US Army OPDS (e.g., change in force structure implies that there may be a change in who gets trained and in what numbers). This information is provided to the analyst for computing cross-impacts; i.e., provides the analyst with a sensing for the timing and level of impact on other events and trends. Events which are allowed to occur more than once are annotated "(Recurring Event.)"

**2-GI BILL**—Congress reinstates the GI Bill for education. (3 OI)

**3-MIL QUAL STANDARDS TEST**—Army officers (01 to 06) are required to take some form of periodic military qualification standards tests to validate their knowledge of one or a combination of the following: Branch, Functional Area, Area of Concentration and/or Skill. TRADOC has developed and distributed to all officers (01 to 05) Military Qualification Standards (MQS) materials. (1 OI)

**5-MEASURE OFFICER POTENTIAL**—An accurate and credible measure of Army officer potential is developed (i.e., capacity for growth, development or progress). (2 OI)

**6-ABILITIES/REQTS MATCH**—An accurate and credible system for matching Army officer abilities with Army requirements is developed. (1 OI)

**8-UNAUTHORIZED NUCLEAR LAU**—A US Army officer initiates a successful unauthorized launch of a nuclear weapon against the USSR (US and USSR are not in armed conflict).

The missile is diverted to a remote area by the US and little damage results. (3 OI)

**9-ARMY TO CONTROL RIOTS**—Congress authorizes the use of active duty military forces to control riots in the US (the Posse Comitatus Act is modified to permit this to occur). (2 OI)

**10- RETIREMENT CHANGES EXTEND**—Army retirement system is restructured such that the minimum TIS at retirement is extended to 30 years in order to receive 50% retirement benefit. (2 OI)

**11-RESERVES MOBILIZED**—President orders mobilization of less than 100,000 Army reserve component personnel. (2 OI)

**12-AC COMMANDS RC BATTALION**—Active component Army officers are assigned to command at least 25% of the reserve component battalions. (2 OI)

**13-US IN MID/HI CONV WAR**—US is involved in a mid-to-high intensity conventional armed conflict with a major power (war lasts for approximately four years). (2 OI)

**14-WOMEN UNRESTRICTED**—All restrictions on the assignment and utilization of women in the Army are removed except for the exclusion from assignment to a ground gaining Arm. (3 OI)

**15-US IN LOW-INTENSITY WAR**—US is involved in a low-intensity conventional armed conflict with a minor power (conflict lasts for less than one year). (2 OI) (Recurring Event.)

**16-US IN BIO/CHEM WAR**—US is involved in an armed conflict in which chemical or biological weapons are exchanged (war lasts for approximately three years). (2 OI)

**18-LIFE-SPAN INCREASED**—Life-span increased by 20-50 years with commensurate increase in vigor. (3 OI)

**19-NEW ACFT TRANSPORTER**—USAF fields a new aircraft transporter capable of reaching Europe in 90 minutes. (3 OI)



**22-OTHER SVCS IN ARMY**—Army units below corps are reorganized to include elements of other services assigned full time. Personnel management and non-unit training and education is managed by the parent Service. (3 OI)

**26-3-YEAR COMMAND TOURS**—Army increases length of battalion/brigade command tours to 36 months. (1 OI)

**27-INTERNL MIL FORCE**—A permanent, standing international military force is established to guarantee world peace and enforce UN and World Court decisions. US rotates complete units of brigade-size and below to satisfy its commitment. (2 OI)

**28-ARMY 21 ADOPTED**—Total Army converts to a combat organization which envisions tactical regiments and a small higher control headquarters with an Air-Land force. (2 OI)

**29-IMPROVED HUMAN MEMORY**—Biomedical/psychological breakthroughs occur which significantly improve the effectiveness of human memory. (2 OI)

**30-US WITHDRAWS FROM NATO**—US withdraws from the military and civilian arms of NATO. (2 OI)

**31-ARMY ADOPTS LINE/STAFF**—Army implements a general staff system patterned after an American version of the WWII German General Staff and/or the current Navy model. (1 OI)

**33-ARMY ESTAB ENTR REQS**—Army established minimum entrance requirements for officers such that cadets and candidates must achieve a pre-established score on a battery of tests prior to commissioning. (2 OI)

**35-MEXICO TURNS COMMUNIST**—Mexico joins the communist block. (4 OI)

**36-LATERAL ENTRY OF CIV**—Direct commissions to major and lieutenant colonel are granted to civilian specialists in technical fields experiencing a shortage of officers (in addition to AMEDD, JAG and Chaplain). (3 OI)

**37-FRANCE REJOINS NATO**—France rejoins the military arm of NATO and replaces the 5th US Corps along the German border (5th US Corps returns home). (2 OI)

**38-US WITHDRAWS TROOPS**—US adopts an isolationist stance and withdraws a large number of American troops from foreign soil. (3 OI)

**39-MANDATORY NATIONAL SVC**—Congress mandates at least two years of national service (either civilian or military) for all 18-year

olds (service may be deferred until after youth graduates from college permitting service as an officer). Congress does not mandate that military services change their accession standards, service missions or size of force. (2 OI)

**40-REDUCED ACQUISITION TIME**—Army procurement regulations are changed to reduce major equipment acquisition time. (3 OI)

**41-70% STDNT USE COMPUTERS**—At least 70% of all US college students use personal computers as part of their education. (4 OI)

**42-ELECT DB INSTALLED**—Army develops an electronic data base of administrative reference material (e.g., AR's, FMs, ect.) and training materials to support unit/organization operations and training, education and testing. (2 OI)

**43-MERIT PAY FOR OFFICERS**—Congress approves a merit pay system for Army officers (as opposed to the current system of "grade" and "time in service") creating competition among officers within each functional specialty and by rank within the specialty. (2 OI)

**44-VESTED RETIREMENT** — Congress adopts a vested retirement system for military personnel (e.g., soldiers can leave the service early and receive reduced retirement pay at a latter date). (2 OI)

**45-DEPRESSION**—A major depression occurs in the US (e.g., the national unemployment rate exceeds 15% and it seems likely that it will continue for at least four years). (3 OI)

**46-ARMY INSTALLS CBI**—Army installs an extensive computer based instruction (CBI) system using, e.g., MicroTICCIT. A portion (10%) of Army resident and non-resident officer instruction is conducted by CBI which includes the interactive imparting of knowledge and information by computer assisted instruction (CAI) and the management of the administration of training and education for the staff and faculty by computer managed instruction (CMI). (This is the PDOS-recommended policy concerning "Education and Training Methodologies.") (2 OI)

**47-ARMY ESTAB ASSMT CNTRS**—Army establishes assessment centers in conjunction with resident schools or installation-level learning centers designed to assess level of individual officers (O1s through O6s) as to their professional development. The assessment centers evaluate officer: Potential, knowledge, personality traits and attitudes, interests, aptitudes (e.g., integrative skills) motivation and stress adaptation, physical fitness and skills. (1 OI)

48-SELF-ASSESSMENT TESTING — Army establishes a policy which includes self-assessment testing as part of resident education from captain through general officer. (1 OI)

49-ARMY PATROLS MEX BORDER— President directs Army troops to patrol the US-Mexico border. (2 OI)

50-RESERVES ASGD NATO MSN—Total US commitment to NATO is filled by reserve units stationed in the US. (2 OI)

51-US MIL FORCES COMBINED—US military services are combined into one uniformed service (e.g., Canadian military system). (Analyst Note: Percentage of officers in major categories of branches: 61% = CA; 18% = CS; 21% = CSS.) (1 OI)

52-ANTI-MIL MEDIA CAMPAIGN—US media conducts an extensive anti-military campaign. (3 OI) (Recurring Event)

53-COMPETENCY TESTS ESTAB— Competency tests are established as a prerequisite for schooling at the next Development Period through Development Period 3. (2 OI)

54-PC FOR OFFICERS—Army lets contract which enables individual officers to buy at reduced cost, PCs which are able to operate in a computer based instruction (CBI) mode. (2 OI)

55-CORPORATE SCHOLARSHIPS—Large private corporations establish lucrative college student financial aid packages with follow-on work obligations. (3 OI)

57-DEGREES BY COMPUTER—At least 75% of all major universities offer by way of telecommunications a full range of undergraduate and graduate degree programs. (3 OI)

58-US PROTECTS FOREIGN SUPP—US Army moves to protect a foreign nation which is a supplier of strategic resources to the US or its allies. (2 OI) (Recurring Event)

62-RAPID LEARNING—Psychological techniques which facilitate rapid learning are taught in Army schools. Inexpensive commercially available biomedical technologies are developed that facilitate rapid learning. (2 OI)

63-CHEAP FOOD — Genetic engineering break-throughs provide an abundant inexpensive food source. (4 OI)

64-DUAL LANGUAGE REQT—Army requires all officers to know a foreign language. (1 OI)

65-FIELD DECISION SUPPORT SYS— Army fields computerized decision support systems which are available to all commanders at the company-level and higher. (2 OI)

66-ARMY PROTECTS DOMESTIC—Army assigned the mission of security of major public facilities and other essential services (the Posse Comitatus Act is modified to permit this to occur). (2 OI)

70-ELECTRONIC WARGAMES — Army fields staff-oriented, electronic wargames for training. (2 OI)

71-5TH GENERATION COMPUTER—The Japanese succeed in developing the world's first fifth generation computer. (3 OI)

73-SUPER-POWERFUL HAND-HELD — Low cost hand-held computers are developed which exceed current main-frame computer capabilities. The Army issues these to every officer for access to information by way of telecommunications for problem solving and electronic smart maps, etc. (3 OI)

74-US SPACE DEPT CREATED—All military space responsibilities are consolidated into a fourth defense department—The US Space Force (USSF). Defense permits Army personnel to transfer to the USSF. (2 OI)

75-CRAZY STATE GETS NUKE CAP—A country led by an irrational head of state acquires an operational nuclear capability. (4 OI)

77-50% DROP ROTC—The number of universities participating in Army ROTC programs declines by at least 50% from the number that participated in 1984. (2 OI)

78-NO EDUCATIONAL DEFICIENCIES— Public school systems adopt new learning techniques which virtually eliminate all educational deficiencies caused by early-childhood deprivation. (3 OI)

79-ANTI-ARMS DEMONSTRATIONS — Massive demonstrations for arms control and arms reduction occur throughout the Western world. (3 OI)

80-WIDE-SPREAD RIOTS—Wide-spread riots occur throughout the United States similar to those which occurred during the late 1960s. (3 OI) (Recurring Event)

81-FEDERAL SCHOLARSHIPS — Federal government starts a system of free universities that provide a college education in exchange for Federal work which can be fulfilled by military

service. No change to standards of assessments is directed. (3 OI)

**82-COMMON CORE SKILLS ESTAB**—Army establishes a “road map” of common core skills for each Development Period. The package of common core skills, which is added to the MQS program, includes skills which lead to the mastery of the art and science of war. These skills are:

a. Theoretical knowledge and practical skills/proficiencies at each level of responsibility throughout the Army.

b. The knowledge of the human dimension of combat.

c. An historical perspective of war.

d. The ability to envision future war. (1 OI)

**83-FORMALIZED PD PROG ESTAB**—Army establishes a formalized officer professional development (PD) program at all TOE and TDA units and organizations. The execution of the program is decentralized to the units and organizations but includes as a minimum, professional development in the following:

a. Professional Values.

b. Warrior Spirit.

c. Leader-Mentor Roles/Relationships.

d. Self-Development.

e. Art and Science of War.

f. Common Shared Operational Language.

g. Expert-Integrator Roles/Relationships.

h. Decision Making and Conceptual Skills.

(1 OI)

**84-REQD SCHOOL EXPERIENCE**—Army establishes policy requiring officers to complete schooling as follows: All lieutenants to attend resident OBC prior to first assignment, all captains to attend resident OAC and resident CAS3 (basic assumption: This policy will add approximately 450 man-years—18% increase—to the CPT THS account in any given year), all majors to attend a CSC (no appreciable increase in THS account is anticipated as completion of CSC-level schooling may be accomplished by correspondence) and all colonels to attend an SSC (no appreciable increase in THS account is anticipated as completion of SSC-level schooling may be accomplished by correspondence). (1 OI)

**85-WARRIOR SPIRIT PROG EST**—Army establishes a program to instill the warrior spirit throughout the entire Army which includes:

a. Officer knowledge of the “threat.”

b. More physically and stressfully demanding training.

c. Annual qualification with a basic weapon (results recorded on the OER).

d. Officer knowledge of “practical terrain sense.”

e. Officer knowledge of basic tactical doctrine and employment of common individual and crew-served weapons. (1 OI)

**86-ECONOMY TURNS GOOD**—Economy turns prosperous such that jobs are plentiful with high pay and recruitment and retention is difficult in the Army. (2 OI) (Recurring Event)

**87-DOD BUDGET GREATLY CUT**—Congress dramatically reduces Defense budget such that pay is frozen, retirement benefits (e.g., PX, commissary and medical benefits) are reduced, PCS costs are forced to be reduced such that average tour lengths must be extended to four years with extensions granted for an additional year. (2 OI) (Recurring Event)

**88-SAT SCORES DECLINE**—Scholastic Aptitude Scores (SAT) decline Nation-wide. (2 OI) (Recurring Event)

**89-LIVE AMMO USE REDUCED**—Deep budget cuts greatly reduce the use of live ammunition for training in small arms, cannons, rockets and missiles. (2 OI) (Recurring Event)

**90-SPARE PARTS REDUCED**—Deep budget cuts greatly reduce availability of spare parts for equipment maintenance. (2 OI) (Recurring Event)

**91-OIL SHORTAGE HITS ARMY**—Oil shortage prohibits Army field units from engaging in extensive training at Army training centers and posts throughout the world. (2 OI) (Recurring Event)

**92-SOFTWARE REVOLUTION**—A software revolution occurs such that computer controlled military equipment is totally user friendly precluding the need for continuous retraining when new equipment is fielded. (2 OI)

**93-SR OFFICERS CENSURED**—Several senior military officers throughout DOD are censured by DOD and Executive Branch for their outspoken stance on sensitive political/military issues. (2 OI) (Recurring Event)

94-CMD TIME, ONE YEAR—Army develops a policy which reduces command time at all levels to no longer than one year at a time, with no extensions. (2 OI) (Recurring Event)

95-EUROPE TOURS SHORTENED—Army shortens length of tours in Europe to 12-18 months. (2 OI)

96-QUALITY OFFS TO TOE—Army establishes priority of assignment of quality officers to TOE units thereby causing a shortfall of qualified instructors at TRADOC schools. (2 OI) (Recurring Event)

97-REDUCED EXPERT/INTEGRAT—Rapid expansion of the Army occurs due to armed conflict causing a lack of ability of the Army to “groom” officers as “experts/integrators.” (1 OI)

98-MODERN EQUIPMENT—Rapid increase in modernization of Army equipment occurs similar to 1983-86 modernization program (begins in about 2005). (2 OI)

99-INCR IN OFF ASSESSIONS—Rapid increase in officers within the Army caused by armed conflict causes a reduction in minimum educational standards for officer assessments for OCS (i.e., baccalaureate degree is not required). (2 OI)

There is space in the INTERAX model for 100 events. This list reflects the following:

Events in this model:	79	
Event numbers not used:	21	<u>100</u>

The following event numbers are available for use:

- 1
- 4
- 7
- 17
- 20
- 21
- 23
- 24
- 25
- 32
- 34
- 56
- 59
- 60
- 61
- 67
- 68
- 69
- 72
- 76
- 100

The following event numbers are “Recurring Events.”

- 15
- 52
- 58
- 80
- 86
- 87
- 88
- 89
- 90
- 91
- 93
- 94
- 96

# Trends

## In The INTERAX Model

Following each description of the trend is a parenthetical comment written as, e.g., "(1 OR)," which means the "order of relationship" between the trend and the Officer Professional Development System (OPDS). A 1st order relationship describes a direct relationship (e.g., a measure of performance of OPDS); a 2d order relationship describes a relationship which must pass through one other actor in the military environment before it reaches the US Army OPDS (e.g., change in force structure implies that there may be a change in who gets trained and in what numbers). This information is provided to the analyst for computing cross-impacts; i.e., provides the analyst with a sensing for the timing and level of impact when the trend is impacted by an impacting event.

1-LOSS OF OFFICERS TO CIV—Rate of loss of officers to the civilian sector or to other services. (2 OR)

2-PERCENT POS REQT COMPUTER USE—Percent of officer positions requiring daily operations of computer systems to accomplish the mission. (3 OR)

3-OFFICERS USING COMPUTERS—Percentage of Army officers with the ability to effectively use computer systems to accomplish the mission. (2 OR)

4-PERCENT WOMEN IN ARMY—Women in the Army as a percentage of the total force. (3 OR)

5-NO. LTS IN AC ARMY—Number of lieutenants in the active component Army (28% of all AC officers). (3 OR)

6-REQT FOR ENGR AND TECH SKIL—Requirements for Army officers with engineering and technical skills. (2 OR)

7-PERCENT DEFICIENT IN BASIC SKI—Percentage of Army officers who are deficient in basic educational skills. (2 OR)

8-NO. CPTS IN AC ARMY—Number of captains in the active component Army (37% of all AC officers). (3 OR)

9-NO. MAJS IN AC ARMY—Number of majors in the active component Army (19% of all AC officers). (3 OR)

10-NO. LTCS IN AC ARMY—Number of lieutenant colonels in the active component Army (12% of all AC officers). (3 OR)

11-TIME TO TRAIN CO GRADE—Time needed to prepare officers to meet minimum company grade requirements. (1 OR)

12-TIME TO TRAIN FIELD GRAD—Time needed to prepare officers to meet minimum field grade requirements. (1 OR)

13-AVERAGE TIS FOR OFFICERS—Average time in service for officers. (2 OR)

14-COST OF OFFICER TRAINING AND EDUCATION—Cost of Army officer training and education system in constant dollars. (1 OR)

15-NO. COLS IN AC ARMY—Number of colonels in the active component Army (4% of all AC officers). (3 OR)

16-CBT READINESS, CONV FORC—Combat readiness of conventional Army forces. (1 OR)

17-NO. BGS & MGS IN AC ARMY—Number of brigadier and major generals in the active component Army. (3 OR)

18-NO. SR GENS IN AC ARMY—Number of lieutenant generals and generals in the active component Army. (3 OR)

19-US VS USSR TECHNOLOGY—Ratio of level of US technology to USSR technology. (3 OR)

20-OFFICER RETRAIN REQT—Amount of Army officer retraining required due to skill obsolescence. (2 OR)

21-COMPUTER/COMM-COMBAT—Degree to which Army makes effective use of computers/communications to accomplish its COMBAT missions. (3 OR)

22-COMPUTER/COMM-SUPPORT — Degree to which Army makes effective use of computers/communications to accomplish its SUPPORT missions. (3 OR)

23-COMPUTER/COMMTNG & ED— Degree to which Army makes effective use of computers/communications to accomplish its officer TRAINING and EDUCATION missions. (2 OR)

26-NO. LTS IN THS ACCT—Number of lieutenants by man-years in the student portion of the THS account (FY 85 estimate = 4750 LTs). (2 OR)

27-NO. CPTS IN THS ACCT—Number of captains by man-years in the student portion of the THS account (FY 85 estimate = 4498 CPTs). (2 OR)

28-NO. MAJS IN THS ACCT—Number of majors by man-years in the student portion of the THS account (FY 85 estimate = 1415 MAJs). (2 OR)

29-FORCE IN JOINT/COMBINED O— Incidence of Army forces involved in Joint/combined operations. (2 OR)

30-NO. LTCS IN THS ACCT—Number of lieutenant colonels by man-years in the student portion of the THS account (FY 85 estimate = 536 LTCS). (2 OR)

31-NO. COLS IN THS ACCT—Number of colonels by man-years in the student portion of the THS account (FY 85 estimate = 176 COLS).(2 OR)

32-PERCENT AC UNIT TNG/ED—Percent of training and education of active component Army officers accomplished in the unit/organization. (1 OR)

33-CDRS ABIL IN MID/HI CBT—Capability of Army commanders and their staffs to operate effectively for sustained periods in mid- and high-intensity combat. (1 OR)

34-COST OF T & E PCS -Cost to the Army of permanent change of station due to training and education. (2 OR)

35-PERCENT IN-RES TNG/ED—Percentage of training and education of Army officers accomplished in-residence at Army schools. (1 OR)

36-PERCENT NON-RES TNG/ED — Percentage of training and education of Army officers accomplished through non-resident instruction. (1 OR)

37-AVERAGE TIME IN TP 1—Average time spent by lieutenants in Transition Period 1 which includes time spent in Transition Point 1 (OBC) and in post-TP 1 (post-OBC/pre-OAC) assignments. (1 OR)

38-AVERAGE TIME IN TP 2—Average time spent by captains in Transition Period 2 which includes time spent in Transition Point 2 (OAC) and in post-TP 2 (post-OAC/pre-CGSC) assignments. (1 OR)

40-AVERAGE TIME IN TP 3—Average time spent by majors and lieutenant colonels in Transition Period 3 which includes time spent in TP 3 (CGSC) and in post-TP 3 (post-CGSC/pre-AWC) assignments. (1 OR)

41-AVERAGE TIME IN TP 4—Average time spent by colonels in Transition Period 4 which includes time spent in Transition Point 4 (AWC) and in post-TP 4 (post-AWC/pre-BG designation) assignments. (1 OR)

42-AVERAGE TIME IN TP 5—Average time spent by brigadier and major generals in Transition Period 5. (1 OR)

44-OFFICER WITH PC-HOME—Percentage of Army officers with PCs/terminals at home which are capable of supporting computer-assisted instruction by telecommunications. (2 OR)

46-MODERNIZATION OF EQUIP—Rate of modernization of Army equipment (including weapons). (2 OR)

47-GAP-RESERVE VS REQT—Size of gap between capabilities of part-time (reserve) field grade officers and the requirements of the positions they would fill in war-time. (1 OR)

50-ARMY T & E BUDGET—Size of the Army training and education budget in constant dollars. (2 OR)

51-LT SKL/APTITUDE LEVEL—Average skill/aptitude level of lieutenants when they enter the Army. (2 OR)

52-NO. AC ENLISTED—Number of enlisted personnel in the AC Army (88% of AC force). (3 OR)

53-NO. AC TDA OFFICERS—Number of officers in the AC "TDA" Army (48% of AC officers). (3 OR)

55-NO. AC OFFICERS IN TOE—Number of officers in the AC field Army (38% of AC officers). (3 OR)

56-NO. AC OFF IN NON-FLD—Number of officers in the AC “non-field” Army (Trend-53 = Trend-54) (62% of AC officers). (3OR)

57-TOTAL AC ARMY OFFICERS—Total number of active component Army officers (Trend-55 + Trend-56) (10% of AC force). (3 OR)

58-TOTAL AC ARMY PERSONNEL—Total size of the AC force (Trend-52 + Trend-57). (3 OR)

66-ARMY ESPRIT DE CORPS—Level of Army esprit de corps. (2 OR)

67-ABIL OF JR TO REPL SR—The ability of junior commissioned officers, warrant officers and noncommissioned officers to replace senior leaders lost in combat. (1 OR)

68-PROFESSIONAL VALUES—Level of officer adherence affectively and behaviorally to the complex set of professional values described in the “PDOS System-Wide Transition Period” literature: briefly—officers accept the responsibility for protecting the Nation; they internalize and display the values of integrity, selflessness, honesty, special trust, loyalty, care for soldiers and their families, excellence in performance of all duties; they establish a command climate which produces initiative, trust and mentorship. (1 OR)

69-WARRIOR SPIRIT—Level of officer adherence to the state-of-mind and preparedness that blends all the physical, mental and moral qualities essential for an officer to successfully lead the Army in its mission of protecting the Nation. Officers accept the responsibility of being entrusted with the protection of the Nation; are prepared physically and mentally to lead units to fight and support in combat; are skilled in the use of weapons, organizations and tactics; inspire confidence and an eagerness to be part of a team; has the ability to analyze and the boldness to take action to accomplish the mission. (1 OR)

70-LEADER-MENTOR—Level of the amount of time officers have to develop a style of leadership which facilitates the growth and development of subordinates by educating, socializing and training subordinates and by being for those subordinates a role model, a teacher, a coach, an advisor and a guide. (1 OR)

71-DECISION MAKING SKILLS—Level of officer ability to use analytical and conceptual

skills necessary to establish goals and objectives, identify problems, develop alternatives, evaluate alternatives, choose an alternative, implement, control and evaluate decisions. (1 OR)

72-NATL WILL TO SUPT MILIT—US national will to support military defense operations. (3 OR)

73-CONGR SPT FOR MILIT—Congressional support for the military. (3 OR)

74-THREAT OFF SKILL PROFICY—Level of Threat Army officers’ skill proficiency. (2 OR)

75-ART & SCIENCE OF WAR—Level of officer adherence to the principles of and knowledge of the art and science of war which includes:

a. Theoretical knowledge and practical skills/proficiencies for each Development Period.

b. Knowledge of the human dimension of combat.

c. An historical perspective of war.

d. The ability to envision the future war.

(1 OR)

76-EXPERT-INTEGRATOR—Expert: Level of officer in-depth knowledge and capabilities in a single branch, functional area and/or area of concentration, the major contribution of which is within a specifically defined area. Integrator: Level of officer knowledge and capabilities in one or more branches, functional area and/or areas of concentration and ability to analyze, synthesize, conceptualize and/or use decision making skills to achieve synergistic results affecting multiple areas. (1 OR)

78-ARMY OFF SKILL PROFICY—Level of Army officers’ skill proficiency. (1 OR)

80-COMMON OPNL LANGUAGE—Level of officer proficiency in the skills associated with using a common military operational language. (1OR)

81-SELF-DEVELOPMENT—Level of officer acceptance of primary responsibility to progressively grow and learn, both the profession of arms and his/her functional specialty(ies). (1OR)

83-ARMY-THREAT SKILL PROFICY— Difference in skill proficiency between US Army officers and Threat Army officers (Trend-78 minus Trend-74). (1 OR)

There is space in the INTERAX model for 85 trends. This list reflects the following:

Trends in this model:	65
Trend numbers not used:	20
	<u>85</u>

The following trend numbers are available for use:

- |     |     |
|-----|-----|
| -24 | -62 |
| -25 | -63 |
| -39 | -64 |
| -43 | -65 |
| -45 | -77 |
| -48 | -79 |
| -49 | -82 |
| -54 | -84 |
| -59 | -85 |
| -61 |     |



# Recapitulation Of PDOS INTERAX Model

## And Policy Impact Analysis Using Computer Simulations

### 1. Events Relating To Armed Conflict Between The US And Other Nations Are (8 Events):

E-8: Unauthorized Nuclear Launch.

E-11: Reserves Mobilized.

E-13: US in Mid-/High Intensity Conventional War.

E-15: US in Low-Intensity Conventional War.

E-16: US in Bio/Chemical War.

E-58: US Protects Foreign Supplier.

E-97: Reduction In Expert/Integrator "Grooming" Due To Armed Conflict.

E-99: Large Increase In Officer Assessions Due To Armed Conflict.

### 2. Events, Generally Relating To Armed Conflict In That They Are Not Likely To Occur During A Prolonged (2 + Years) Armed Conflict (Assumption: There Is Popular and Congressional Support For The Armed Conflict). The Events Could Occur During Times Of No Conflict (3 Events):

E-87: DOD Budget Greatly Cut.

E-89: Live Ammunition Use Reduced.

E-90: Spare Parts Reduced.

### 3. Events Relating to Domestic/Internal Control Mission For The Army Are (5 Events):

E-9: Army to Control Riots.

E-35: Mexico Turns Communist.

E-49: Army Patrols Mexico/US Border.

E-66: Army Protects Domestic Facilities/Services.

E-80: Wide-Spread Riots.

### 4. Environmental Events Are (16 Events):

E-18: Life-Span Increased.

E-29: Improvements In Human Memory Are Developed.

E-37: France Rejoins NATO.

E-41: 70% College Students Use Computers.

E-52: Anti-Military Media Campaign Develops.

E-55: Corporate Scholarships Established.

E-57: Bachelors and Masters Degrees By Computer Are Available.

E-63: Genetic Engineers Develop Inexpensive Food Source.

E-71: 5th Generation Computer Developed By Japan.

E-75: 3d World Country Led By Irrational Government Gets Nuke.

E-77: 50% Drop in ROTC.

E-78: Educational Deficiencies Eliminated In Public Schools.

E-79: Massive Anti-Arms Demonstrations Occur In Western World.

E-86: Economy Turns Good.

E-88: SAT Scores Decline.

E-91: Oil Shortage Hits Army.

### 5. Environmental Policy Events, External To PDOS, Are (29 Events):

E-2: GI Bill Reinstated.

E-10: Retirement Changed To 30 Year Minimum.

E-12: AC LTC's Command RC Battalions.

E-14: Role of Women Made Unrestricted Except In Inf/Arm/Cannon FA.

E-19: New Aircraft Transporter Fielded (NATO In 90 Minutes).

E-22: Significant Number Of Other Services In The Army.

E-26: 3 Year Command Tours.

E-27: International Military Force Established (US Is Part).

E-28: Army 21 Adopted.

E-30: US Withdraws From NATO.

E-31: Army Adopts Line/Staff Concept.

E-36: Lateral Entry Of Civilians Required.

E-38: US Withdraws Significant Number of Troops.

E-39: Mandatory National Service Mandated By Congress.

E-40: Materiel Acquisition Time Significantly Reduced.

E-43: Merit Pay For Officers Adopted.

E-44: Vested Retirement System Established.

E-45: Depression (15% Unemployment For 4 Years).

E-50: Reserves Assigned NATO Mission (US Is Home Station -AC Army Returns Home).

E-51: US Military Forces Combined.

E-62: Rapid Learning Techniques Developed/Taught In Army Schools.

E-74: US Space Department Created.

E-81: Federal Scholarship Program Established.

E-92: Software Revolution.

E-93: Senior Military Officers Censured.

E-94: Command Time Reduced To One Year.

E-95: Europe Tours Shortened.

E-96: Quality Officers To TOE Units.

E-98: Extensive Equipment Modernization Program Begun.

6. PDOS Policies Are (11 Policies):

E-3: MQS Tests Established.

E-33: Army Establishes Pre-Commissioning Entrance Requirements.

E-46: Army Installs Extensive Computer Based Instruction (CBI).

E-47: Assessment Centers Established.

E-48: Self-Assessment Testing Established.

E-53: Competency Tests Established.

E-70: Additional Electronic Wargames Fielded.

E-82: Common Core Skills Established.

E-83: Formalized Professional Development Program Established.

E-84: Required School Experience.

E-85: Warrior Spirit Program Established.

7. Policies Relating To The Professional Development of Officers, But Not Being Considered By The PDOS Are (7 Policies):

E-5: Measure of Officer Potential Developed/Used.

E-6: Abilities/Requirements Match Developed/Used.

E-42: Electronic Data Base Installed.

E-54: "PCs for Officers" Contract.

E-64: Dual Language Requirement.

E-65: Decision Support System (DSS) Fielded.

E-73: Super-Powerful Hand-Held Computers Given to Officers.

8. PDOS System-Wide Issues (SWIs) Are (8 SWIs):

T-68: Professional Values.

T-69: Warrior Spirit.

T-70: Leader-Mentor.

T-71: Decision Making Skills.

T-75: Art and Science of War.

T-76: Expert-Integrator.

T-80: Common Shared Operational Language.

T-81: Self-Development.

9. Measures Of The Performance Of The Officer Professional Development System Are (12 Performance Measures):

T-16: Combat Readiness of the Conventional Force.

T-21: Computers/Communications in Combat-Effective Use.

T-22: Computers/Communications in Support-Effective Use.

T-23: Computers/Communications in Training/Education—Effective Use.

T-33: Commanders' Ability in Mid-/High-Intensity Combat.

T-47: Gap Between Reserve Officer Capability and Requirements.

T-66: Army Esprit De Corps.

T-67: Ability of Juniors to Replace Seniors.

T-72: National Will to Support the Military.

T-73: Congressional Support for the Military.

T-78: Army Officer Skill Proficiency.

T-83: Army Officer Threat - Army Officer Skill Proficiency.

10. INTERAX Trends Which Are Of Interest To The Officer Professional Development System (30 Trends) ("\*" Denotes That Off-Line Spread Sheets Have Been Created):

\* T-2: Percent Positions Requiring Computer Use.

\* T-4: Percent of Women in the Army.

\* T-6: Requirements For Engineering and Technical Skills.

\* T-7: Percent Deficient in Basic Skills.

T-11: Time to Train Company Grade Officers.

T-12: Time to Train Field Grade Officers.

\* T-13: Average TIS for Officers.

\* T-14: Cost of Officer Training and Education.

T-20: Officer Retraining Requirements Due to Skill Obsolescence.

\* T-26: Number of Lieutenants in the THS Account.

\* T-27: Number of Captains in the THS Account.

\* T-28: Number of Majors in the THS Account.

\* T-30: Number of Lieutenant Colonels in the THS Account.

\* T-31: Number of Colonels in the THS Account.

T-32: Percent of Active Component Unit Training/Education.

\* T-34: Cost of Training/Education PCSs.

T-35: Percent Officer In-Residence Training/Education.

T-36: Percent Officer Non-Resident Training/Education.

T-37: Average Time in Developmental Period Lieutenant.

T-38: Average Time in Developmental Period Captain.

T-40: Average Time in Developmental Period Major/Lieutenant Colonel.

T-41: Average Time in Developmental Period Colonel.

T-42: Average Time in Developmental Period General Officer.

\* T-50: Army Training/Education Budget.

T-51: Skill/Aptitude Level of Entering Lieutenants.

\* T-52: Number of Active Component Enlisted.

\* T-53: Number of Active Component TDA Officers.

\* T-55: Number of Active Component Officers in TOE.

\* T-57: Number of Active Component Army Officers.

\* T-58: Number of Active Component Army Personnel.

11. PDOS System-Wide Issues And The Events/Policies Which Impact On Them (Maximum Impact In Parentheses After Event Description):

a. Professional Values (T-68):

(1) Environmental Events/Policies:

E-8—Unauthorized Nuclear Launch (1.05).

E-49—Army Patrols Mexico/US Border (1.05).

E-93—Senior Officers Censured (.98).

(2) PDOS-Recommended Policies:

E-48—Self-Assessment Testing (1.05).

E-53—Competency Tests Established (1.05).

E-82—Common Core Skills Established (1.05).

E-83—Formalized Professional Development Program Established (1.05).

**b. Warrior Spirit (T-69):**

**(1) Environmental Events/ Policies:**

- E-9 —Army To Control Riots (1.05).
- E-13—US In Mid/Hi-Intensity Conventional War (1.50).
- E-15—US In Low-Intensity War (1.50).
- E-16—US In Bio/Chem War (1.50).
- E-28—Army 21 Adopted (1.05).
- E-30—US Withdraws From NATO (.90).
- E-37—France Rejoins NATO, 5th US Corps Returns Home (.90).
- E-38—US Withdraws Troops (.90).
- E-49—Army Patrols Mexico/US Border (1.05).
- E-58—US Protects Foreign Supplier Of Strategic Resources (1.10).
- E-66—Army Protects Domestic Facilities/Services (1.05).

**(2) PDOS-Recommended Policies:**

- E-3 —MQS Tests Established (1.05).
- E-47—Army Establishes Assessment Centers (1.10).
- E-48—Self-Assessment Testing Program Established (1.05).
- E-53—Competency Tests Established (1.10).
- E-70—Additional Electronic Wargames Fielded (1.03).
- E-83—Formalized Professional Development Program Established (1.25).
- E-85—Warrior Spirit Program Established (1.50).

**c. Leader - Mentor (T-70):**

**(1) Environmental Events/Policies:**

- E-8—Unauthorized Nuclear Launch (1.15).
- E-9 —Army To Control Riots (1.05).
- E-13—US In Mid/Hi-Intensity Conventional War (1.50).
- E-15—US In Low-Intensity War (1.50).
- E-16—US In Bio/Chem War (1.50).
- E-26—3-Year Command Tours At Bn/ Bde (1.10).

E-31—Army Adopts Line/Staff System (1.05).

E-49—Army Patrols Mexico/US Border (1.05).

E-66—Army Protects Domestic Facilities/Services (1.05).

E-70—Command Time Reduced To One Year (.80).

**(2) PDOS-Recommended Policies:**

- E-3 —MQS Tests Established (1.05).
- E-47—Army Establishes Assessment Centers (1.05).
- E-48—Self-Assessment Testing Established (1.05).
- E-53—Competency Tests Established (1.05).
- E-70—Additional Electronic Wargames Fielded (1.03).
- E-83—Formalized Professional Development Program Established (1.15).
- E-84—School Experience Required For All Officers (1.05).

**(3) Non-PDOS-Recommended Professional Development Policies:**

E-6—Abilities/Requirements Match Established (1.05).

**d. Decision Making Skills (T-71):**

**(1) Environmental Events/Policies:**

- E-5 —Measure Of Officer Potential Developed/Used (1.30).
- E-13—US In Mid/Hi-Intensity Conventional War (1.25).
- E-26—3-Year Command Tours At Bn/ Bde (1.02).
- E-29—Improvements In Human Memory (1.50).
- E-62—Rapid Learning Technology Taught in Schools (1.10).

**(2) PDOS-Recommended Policies:**

- E-3 —MQS Tests Established (1.30).
- E-33—Army Establishes Entrance Requirements (1.10).
- E-46—Army Installs CBI (1.10).
- E-47—Army Establishes Assessment Centers (1.05).

E-48—Self-Assessment Testing Established (1.03).

E-53—Competency Tests Established (1.10).

E-70—Additional Electronic Wargames Fielded (1.03).

E-82—Common Core Skills Established (1.10).

E-83—Formalized Professional Development Program Established (1.10).

(3) Non-PDOS-Recommended Professional Development Policies:

E-6—Abilities/Requirements Match Established (1.30).

E-65—DSS Fielded (1.20).

E-73— Super-Powerful Hand-Held Computers Issued (1.10).

**e. Art and Science of War (T-75):**

**(1) Environmental Events/Policies:**

E-13—US In Mid/Hi-Intensity Conventional War (1.25).

E-15—US In Low-Intensity War (1.05).

E-16—US In Bio/Chem War (1.25).

E-28—Army 21 Adopted (1.05).

E-29—Improvements In Human Memory (1.50).

E-49—Army Patrols Mexico/US Border (1.03).

E-58—US Protects Foreign Supplier Of Strategic Resources (1.10).

**(2) PDOS-Recommended Policies:**

E-3 —MQS Tests Established (1.25).

E-46—Army Installs CBI (1.05).

E-47—Army Establishes Assessment Centers (1.10).

E-48—Self-Assessment Testing Established (1.05).

E-53—Competency Tests Established (1.10).

E-70—Additional Electronic Wargames Fielded (1.03).

E-82—Common Core Skills Established (1.10).

E-83—Formalized Professional Development Program Established (1.10).

E-84—School Experience Required For All Officers (1.05).

E-85—Warrior Spirit Program Established (1.10).

**f. Expert-Integrator (T-76):**

**(1) Environmental Events/Policies:**

E-10—Retirement System Extended (1.30).

E-13—US In Mid/Hi-Intensity Conventional War (1.25).

E-15—US In Low-Intensity War (1.25).

E-16—US In Bio/Chem War (1.20).

E-26—3 Year Command Tours At Bn/ Bde (1.02).

E-28—Army 21 Adopted (1.05).

E-29—Improvements In Human Memory (1.05).

E-31—Army Adopts Line/Staff System (1.25).

E-51—US Military Forces Combined (1.50).

E-94—Command Time Reduced To One Year (.80).

E-95—Europe Tours Shortened (.95).

E-97—Reduction In Expert/Integrator "Grooming" Due To Armed Conflict (.20).

**(2) PDOS-Recommended Policies:**

E-3 —MQS Tests Established (1.25).

E-46—Army Installs CBI (1.05).

E-47—Army Establishes Assessment Centers (1.10).

E-48—Self-Assessment Testing Established (1.05).

E-53—Competency Tests Established (1.10).

E-70—Additional Electronic Wargames Fielded (1.03).

E-82—Common Core Skills Established (1.10).

E-83—Formalized Professional Development Program Established (1.10).

E-84—School Experience Required For All Officers (1.10).

(3) Non-PDOS-Recommended Professional Development Policies:

E-42—Electronic Data Base Installed (1.20).

E-65—DSS Fielded (1.30).

E-73— Super-Powerful Hand-Held Computers Issued (1.10).

**g. Common Shared Operational Language (T-80):**

**(1) Environmental Events/Policies:**

E-13—US In Mid/Hi-Intensity Conventional War (1.25).

E-15—US In Low-Intensity War (1.25).

E-16—US In Bio/Chem War (1.25).

**(2) PDOS-Recommended Policies:**

E-3 —MQS Tests Established (1.10).

E-46—Army Installs CBI (1.05).

E-47—Army Establishes Assessment Centers (1.10).

E-53—Competency Tests Established (1.10).

E-70—Additional Electronic Wargames Fielded (1.03).

E-82—Common Core Skills Established (1.10).

E-83—Formalized Professional Development Program Established (1.10).

E-84—School Experience Required For All Officers (1.05).

**(3) Non-PDOS-Recommended Professional Development Policies:**

E-42—Electronic Data Base Installed (1.05).

**h. Self-Development (T-81):**

**(1) Environmental Events/Policies:**

E-13—US In Mid/Hi-Intensity Conventional War (1.50).

E-16—US In Bio/Chem War (1.50).

E-29—Improvements In Human Memory (1.50).

E-39—Mandatory National Service Established (1.25).

E-43—Merit Pay For Officers Established (1.15).

E-57—Degrees Offered By Computer (1.05).

**(2) PDOS-Recommended Policies:**

E-3 —MQS Test Established (1.50).

E-33—Army Establishes Entrance Requirements (1.05).

E-46—Army Installs CBI (1.10).

E-47—Army Establishes Assessment Centers (1.10).

E-48—Self-Assessment Testing Established (1.50).

E-53—Competency Tests Established (1.25).

E-70—Additional Electronic Wargames Fielded (1.03).

E-82—Common Core Skills Established (1.10).

E-83—Formalized Professional Development Program Established (1.10).

E-84—School Experience Required For All Officers (1.05).

E-85—Warrior Spirit Program Established (1.05).

**(3) Non-PDOS-Recommended Professional Development Policies:**

E-5 —Measure Of Officer Potential Developed/Used (1.50).

E-42—Electronic Data Base Installed (1.20).

E-54—CBI PCs For Officers (2.00).

E-64—Dual Language Requirement For Officers (1.10).

E-73— Super-Powerful Hand-Held Computers Fielded (1.10).

**12. Computer Simulations Using INTERAX Have Been Run And Are:**

a. A "statistical" run/simulation of all data in the PDOS model to verify the accuracy of all data in the computer.

b. Two "free play" runs/simulations of all data with policies occurring/not occurring as follows:

**(1) Without policy:**

(a) PDOS-recommended policies suppressed: E-3, E-33, E-46, E-47, E-48, E-53, E-70, E-82, E-83, E-84 and E-85.

(b) Other PD policies suppressed: E-5, E-6, E-42, E-54, E-64, E-65 and E-73.

(2) With policy occurring as follows:

(a) PDOS-recommended policies occurring as follows:

In 1987:

- E-70: Additional Electronic Wargames.
- E-82: Common Core Skills Established.
- E-83: Formalized PD Program Established.
- E-85: Warrior Spirit Program Established.

In 1988:

E-84: Required School Experiences Established.

In 1989:

- E-33: Army Establishes Entrance Requirements.
- E-48: Self-Assessment Testing Established.
- E-53: Competency Tests Established.

In 1990:

E-3: MQS Testing For O1s to O5s Established.

E-46: Army Installs CBI Program.

In 1991:

E-47: Army Establishes Assessment Centers.

(b) Other PD policies as shown in (1) (b), this subparagraph, suppressed.

c. Two "World-at-War" Possible Future" statistical runs/simulations with events and policies occurring/not occurring as follows (and table 1):

(1) Without policy:

(a) All "War Related" events in paragraph 1, Recapitulation of PDOS INTERAX Model, occurring as follows:

1986: E-15—US In Low-Intensity Conventional War.

1990: E-58—US Protects Foreign Supplier.

1995: E-13—US In Mid-/Hi-Intensity Conventional War.

1996: E-11—Reserves Mobilized.

2015: E-16—US In Bio/Chem War.

2015: E-8—Unauthorized Nuclear Launch.

Start Suppress	Lift Suppress	Suppress Again	Lift Suppress	Suppress Again	
1984	1995	1998	2015	2018	E-97—Reduction In Expert/ Integrator "Grooming" Due To Armed Conflict.
1984	1995	1998	2015	2018	E-99—Large Increase In Officer Assessions Due To Armed Conflict.

TABLE 1

(b) All events generally relating to armed conflict in that they would not occur during a prolonged (2+ years) armed conflict (assumption: there is "Popular and Congressional Sup-

port" for the armed conflict) in paragraph 2, Recapitulation of PDOS INTERAX Model (see Table 2).

Start Suppress	Lift Suppress	Start Suppress	Lift Suppress	
1995	1998	2015	2017	E-87—DOD Budget Greatly Cut.
1995	1998	2015	2017	E-89—Live Ammunition Use Reduced.
1995	1998	2015	2017	E-90—Spare Parts Reduced.

TABLE 2

(c) All "Domestic/Internal Control" events in paragraph 3, Recapitulation of PDOS INTERAX Model, suppressed: E-9, E-35, E-49, E-66 and E-80.

(d) All "PDOS Recommended Policy" events in paragraph 6, Recapitulation of PDOS INTERAX Model, suppressed: E-3, E-33, E-46, E-47, E-48, E-53, E-70, E-82, E-83, E-84 and E-85.

(e) All "Other OPDS Related Policy" events (not being considered by PDOS) in paragraph 7, Recapitulation of PDOS INTERAX Model, suppressed: E-5, E-6, E-42, E-54, E-64, E-65 and E-73.

(2) With policy:

(a) Events in (1) (a) and (b), this subparagraph, occurring at times indicated.

(b) Events in (1) (b), (d) and (e) this subparagraph, suppressed.

(c) PDOS-recommended policies occurring as follows:

In 1987:

E-70: Additional Electronic Wargames.

E-82: Common Core Skills Established.

E-83: Formalized PD Program Established.

E-85: Warrior Spirit Program Established.

In 1988:

E-84: Required School Experiences Established.

In 1989

E-33: Army Establishes Entrance Requirements.

E-48: Self-Assessment Testing Established.

E-53: Competency Tests Established.

In 1990:

E-3: MQS Testing For O1s to O5s Established.

E-46: Army Installs CBI Program.

E-47: Army Establishes Assessment Centers.

d. Two "Domestic/Internal Control' Possible Future" statistical runs/simulations with events and policies occurring/not occurring as follows:

(1) Without policy:

(a) All "Domestic/Internal Control" events in paragraph 3, Recapitulation of PDOS INTERAX Model, occurring as follows:

1990: E-9 —Army To Control Riots.

1990: E-80—Wide-Spread Riots.

1992: E-49—Army Patrols Mexico/US Border.

1995: E-35—Mexico Turns Communist.

1995: E-66—Army Protects Domestic Facilities/Services.

(b) All "War Related" events in paragraph i, Recapitulation of PDOS INTERAX Model, suppressed: E-8, E-11, E-13, E-15, E-16, E-58, E-97 and E-99.

(c) All "PDOS Recommended Policy" events paragraph 6, Recapitulation of PDOS INTERAX Model, suppressed: E-3, E-33, E-46, E-47, E-48, E-53, E-70, E-82, E-83, E-84 and E-85.

(d) All "Other OPDS Related Policy" events (not being considered by PDOS) in paragraph 7, Recapitulation of PDOS INTERAX Model, suppressed: E-5, E-6, E-42, E-54, E-64, E-65 and E-73.

(2) With policy:

(a) Events in (1) (a), this subparagraph, occurring at times indicated.

(b) Events in (1) (b), this subparagraph, suppressed.

(c) Policies in (1) (d), this subparagraph, suppressed.

(d) PDOS-recommended policies in (1) (c), above occurring as follows:

In 1987:

E-70: Additional Electronic Wargames.

E-82: Common Core Skills Established.

E-83: Formalized PD Program Established.

E-85: Warrior Spirit Program Established.

In 1988:

E-84: Required School Experiences Established.

In 1989:

E-33: Army Establishes Entrance Requirements.

E-48: Self-Assessment Testing Established.

E-53: Competency Tests Established.

In 1990:

E-3: MQS Testing For O1s to O5s Established.

E-46: Army Installs CBI Program.



In 1991:

E-47: Army Establishes Assessment Centers.

e. Two "International and Domestic Tranquillity' Possible Future" statistical runs/simulations with events and policies occurring/not occurring as follows:

(1) *Without policy:*

(a) All "War Related" and "Domestic/Internal Control" events in paragraphs 1, and 3, Recapitulation of PDOS INTERAX Model, suppressed: E-8, E-9, E-11, E-13, E-15, E-16, E-35, E-49, E-58, E-66, E-80, E-97 and E-99.

(b) All "PDOS Recommended Policy" events paragraph 6, Recapitulation of PDOS INTERAX Model, suppressed: E-3, E-33, E-46, E-47, E-48, E-53, E-70, E-82, E-83, E-84 and E-85.

(c) All "Other OPDS Related Policy" events (not being considered by PDOS) in paragraph 7, Recapitulation of PDOS INTERAX Model, suppressed: E-5, E-6, E-42, E-54, E-64, E-65 and E-73.

(2) *With policy:*

(a) Events in (1) (a), this subparagraph, suppressed.

(b) Policies in (1) (c), this subparagraph, suppressed.

(c) PDOS-recommended policies in (1) (b), this subparagraph, occurring as follows:

In 1987:

E-70: Additional Electronic Wargames.

E-82: Common Core Skills Established.

E-83: Formalized PD Program Established.

E-85: Warrior Spirit Program Established.

In 1988:

E-84: Required School Experiences Established.

In 1989:

E-33: Army Establishes Entrance Requirements.

E-48: Self-Assessment Testing Established.

E-53: Competency Tests Established.

In 1990:

E-3: MQS Testing For O1s to O5s Established.

E-46: Army Installs CBI Program.

In 1991:

E-47: Army Establishes Assessment Centers.

## Appendix 2 to Annex II

### Initial List Of Events And Trends (20 JULY 1984)

1. This Appendix is presented as an historical document to show the reader the extent of potential events and trends which the PDOS Futures Team considered. The list was an initial "cut" which was based on a review of the long-range planning and futures literature. See Appendix 11 for a bibliography of that literature.

2. The framework for initially categorizing events and trends, follows. The number in parentheses is for the initial numbering of the events or trends:

- a. Structuring (E/T 0100).
- b. Manning (E/T 0200).
- c. Training/Education (E/T 0300).
- d. Mobilization and Deployment (E/T 0400).
- e. Facilities (E/T 0500).
- f. Command and Control (E/T 0600).
- g. Equipping (E/T 0700).
- h. Sustaining (E/T 0800).
- i. Managing (E/T 0900).
- j. Technology (E/T 1000).
- k. Resources (E/T 2100).
- l. Threat (E/T 2200).
- m. Demographic (E/T 2300).
- n. Political (E/T 2400).
- o. Technology (E/T 2500).
- p. Sociological (T 2600, Trends, only).

3. The following events were used to create the initial DELPHI questionnaire. These events were not the final list of events used in the INTERAX Model. Appendix 1, this Annex, contains the final list of events which are currently in the PDOS INTERAX Model.

*Structuring (E 0100).* None.

*Manning (E 0200).*

1. Army requires satisfactory test of English as a foreign language (TOEFL) for entry.

2. Army establishes minimum education skills and ability standards for access/retention.

3. Army establishes minimum physical standards for combat MOS.

4. Congress mandates a vested retirement system.

5. Active component officers assigned to command P.C. battalions.

6. Army lifts all restrictions on the assignment and utilization of women.

7. Standard skill testing instituted for all active and reserve component officers to determine suitability for: promotion, command, retention, military and civilian schooling and special assignments.

*Training/Education (E 0300).*

1. Army requires second language for all officers.

2. Army requires English fluency for all officers.

3. Army establishes program to train officers in basic skills (reading, writing, math).

*Mobilization and Deployment (E 0400).*

1. Reserve component officers excluded from field grade positions because of skills required to integrate high-technology systems.

*Facilities (E 0500).* None.

*Command and Control (E 0600).*

1. A commander initiates an unauthorized release of nuclear, chemical or biological weapon(s) against the USSR.

*Equipping (E 0700).* None.

*Sustaining (E 0800).*

1. Congress approves a "pay for demonstrated skills" pay system (as opposed to pay for grade and time in service).

2. Congress approves merit/bonus pay system.

3. Congress approves a "team performance" merit/bonus pay

*Managing (E 0900).*

1. Evaluation report system changed to include combination of superior, peer and subordinate input.

2. Army ends "joint domicile" assignment policy.

*Technology (E 1000).*

1. Genetic engineers develop bacteria capable of decontaminating battlefield (e.g., nuclear, chemical and biological) (similar to bacteria now used to clean-up oil spills).

2. Brain wave measure for potential is developed.

3. Brain wave measure of cognitive skills is developed.

*Resources (E 2100).* None.

*Threat (E 2200).*

1. US is involved in a conflict in Central America.

2. US is involved in a conflict in the Middle East.

3. US is involved in a conflict in Europe.

4. US is involved in a conflict in Asia.

5. US is involved in a conflict in Africa.

6. Conventional conflict with a major power.

7. Conventional conflict with a minor power.

8. US is involved in a nuclear conflict.

9. US is involved in a biological/bacteriological conflict.

10. US is involved in a chemical conflict.

11. Use of federal forces in riot control in US cities.

12. Internal major natural disaster.

13. Terrorists create and explode nuclear weapon.

14. Terrorists steal and explode a US nuclear weapon.

15. Terrorists sabotage nuclear power plant in the US.

16. Bacteriological attack places large portion of US population at risk of death.

17. Coordinated terrorist attack introduces deadly virus/poison into water supply of major US bases in CONUS and in Europe.

18. US dependent on Middle East oil.

*Demographic (E 2300).*

1. US experiences a dramatic flood of refugees from Central and South America.

*Political (E 2400).*

1. Congress offsets (reduces) retirement pay by amount of Social Security benefits.

2. Reserve components take over total US commitment to NATO.

3. US military services combine into one uniformed service (e.g., Canada).

4. Congress institutes draft for active component.

5. Congress institutes draft for reserve components.

6. NATO collapses.

7. United Nations collapses.

8. OPEC collapses.

9. Congress mandates withdrawal of troops from Europe.

10. Congress mandates withdrawal of troops from Korea.

11. Congress mandates withdrawal of troops from Central America.

12. US withdraws from NATO.

13. US withdraws from United Nations.

14. US withdraws from Organization of American States.

15. Congress mandates national service.

16. President directs Army troops to patrol the border between US and Mexico.

*Technology (E 2500).*

1. First military use of weather control.

2. Development in energy technology replaces the need for foreign oil.

3. Use of PSI phenomena for military intelligence purposes.

4. Congress establishes English as the official language and prerequisite for citizenship.

5. Invasion from outer space.

4. The following trends were used to create the initial DELPHI questionnaire. These trends were not the final list of trends used in the INTERAX Model. Appendix 1, this Annex, contains the final list of trends which are currently in the PDOS INTERAX Model.

*Structuring (T 0100).*

1. Size of active component.

2. Size of reserve component.

3. Ability of reserve component soldiers to cope with high-technology, fast-paced battlefield.

4. Increasing emphasis on strategic mobility.

5. Increasing ratio of combat power to warrior.

6. Decreasing ratio of "fist to muscle" (tooth to tail).

7. Increasing ratio of supervisors to operators due to increasing fluctuation of type and volume of critical skills.

8. Increasing trend for combat units to become lighter and more mobile.

9. Number of Joint operations.

*Manning (T 0200).*

1. Increasing number of soldier couples.

2. Increasing percentage of women officers in the Army.

3. Increasing percentage of enlisted women in the Army.

4. Increasing trend toward officers declining command assignments.

5. Requirements for officers with engineering and technical skills.

6. Increasing percentage of minorities of all ranks.

7. Increasing use of robotics and automation causes a decrease in the personnel required to do the same jobs.

8. Increasing percentage of Hispanics in all ranks.

9. Increasing trend for highly trained technical personnel.

10. Increasing trend to open all MOSs to women.

11. Increasing trend towards an older force.

12. Increasing trend for fewer personnel to perform more and more functions.

13. Individual demands for stimulating jobs.

14. Increasing trend to use new technology to provide greater capability rather than reduce manpower.

15. Increasing trend to restrict womens' role in combat assignments.

16. Increasing requirement for a 'two track' promotion system (command/combat versus scientific/technical).

17. Increasing trend to not offer satisfactory promotional tracks to scientific/technical officers.

18. Increasing inability of Army to transition from contractor-maintenance to soldier-maintenance on new equipment.

19. Increasing trend to attain same fire power with fewer soldiers.

20. Increasing resistance to PCS moves.

21. Number of COHORT units.

22. Increasing trend to institutionalize the Regimental system.

*Training/Education (T 0300).*

1. Need for single specialty officers.

2. Need for Joint service professional development.

3. Increasing requirements to retrain personnel as military duties change.

4. Requirement to fight in vastly different environments.

5. Increasing reliance on commercial activities in base operations and training cadre.

6. Reliance on commercial activities decreases active component knowledge and skill base.

7. Increasing explosion in knowledge required for traditional military duties.

8. "Half-life" of information for traditional military duties decreasing.

*Mobilization and Deployment (T 0400).*

1. Decreasing preparation time for conflict increases the demand for readiness during peacetime.

2. Increasing trend towards lighter, more strategically mobile forces.

3. Increasing trend towards the use of the reserve component in a strategic role.

4. Decreasing time available for the mobilization of the reserve component in major conflicts.

5. Increasing trend to federalize the reserve components for emergency operations within the US (e.g., disaster relief, riot control).

*Facilities (T 0500).*

1. Increasing cost of training facilities.

2. Increasing demand by local civilian communities for ownership of existing Army lands.

3. Increasing requirement to replace WWII-vintage buildings and facilities.

4. Increasing demand to create training facilities geared towards high-technology, fast-paced battlefield (e.g., National Training Center, Ft. Irwin, CA).

5. Dramatically increasing telecommunication costs to support computer-based information networks.

*Command and Control (T 0600).*

1. Trend in battalion/brigade-level command tour length.

2. Risk to US non-combatants on foreign soil.

3. Amount of information available for command and control decisions.

4. Resistance to command and control communications on the battlefield.

5. Demands on commanders and their staffs due to combat operations.

6. Trend towards increased complexity of command and control functions due to highly dispersed, highly mobile units on the battlefield.

7. Trend towards increased number and complexity of command and control functions due to increased sophistication of weapon and communication systems.

8. Trend towards increased decentralization of command and control responsibilities.

*Equipping (T 0700).*

1. Trend towards increased availability of equipment for horizontal communications.

2. Need for secure (i.e., encrypted) communications systems.

3. Dependency on reliable high-technology equipment.

4. Need for a shorter acquisition cycle.

5. Need for off-the-shelf materiel acquisition.

6. AMC becomes Army's total distributor/re-distributor of equipment.

7. COSCOM and higher level support organizations become part of AMC mission (i.e., traditional COSCOM and support mission is eliminated).

8. AMC depots deploy to combat areas.

9. Technology services, as known in the past, become subsumed under AMC.

10. Increasing acquisition of foreign weapons systems for Army use.

11. Increasing equipment inter-operability problems within the Army.

12. Increasing problems of inter- and intra-service communications because of diverse communications equipment.

13. Increasing trend towards Joint service acquisition of equipment.

*Sustaining (T 0800).*

1. Increasing ability to sustain the force in the fast-paced, short-notice, deep thrust, multiple challenging environment of the future battlefield.

*Managing (T 0900).*

1. Number of officers separated for cause.

2. Number of officers on active duty with denied/revoked security clearances.

3. Increasing trend towards centralized management of non-human resources.

4. Increasing trend towards decentralized management of human resources.

5. Increasing reliance on external consultants.

6. Increasing trend towards participative management.

7. Trend of officers to resign prior to retirement.

8. Trend towards holistic systems management.

9. Increasing pressure for managers to pursue the search for excellence.

*Technology (T 1000).*

1. Level of acquisition of weapons requiring less maintenance.

2. Use of robotics on the battlefield.

3. Requirement for computer literacy.

4. Army use of robotics for other than battle-field applications.

5. Remote robots use artificial intelligence programming (i.e., capable of "seeing," learning and reacting).

6. Level of DOD acquisition of "Star Wars" technology.

*Resources (T 2100).*

1. Competition between private and public sector for high-skill, high-aptitude personnel.

2. Increasing US dependency on foreign oil.

3. US industrial base continues to dwindle.

4. US dependency on foreign sources for strategic minerals.

5. US use of food as a political weapon.

6. US dependency on foreign weapons acquisition.

*Threat (T 2200).*

1. Military build-up by third world countries.

2. Incidence of terrorism, world-wide, by radical factions and states.

3. Proliferation of nuclear technology in lesser developed countries.

4. Potential for armed conflict between USSR and the US.

5. Soviet power projections in third world.

6. US national will to counter Soviet power projections world-wide.

*Demographic (T 2300).*

1. Number of women in the US labor force.

2. Number of Hispanic immigrants increases.

3. Level of illegal immigration.

4. Level of Hispanic population (i.e., birth rate).

*Political (T 2400).*

1. Congress increases the minimum time in service for military to retire.

2. Level of US military commitments world-wide.

3. Political use of the Army to accomplish social goals (e.g., racial integration, equal opportunity for minorities and women, affirmative action, remedial education) or as a model for accomplishing socio-economic changes.

4. Congress becomes less pro-military.

5. Number of women in the Congress and as a political force.

6. Level of requirement for military leadership to be able to articulate and defend military requirements to the Congress and the American public.

7. Level of military operations controlled by politicians.

8. Level of direct participation by American public in decisions affecting military forces (e.g., policy, budget, force size).

*Technology (T 2500).*

1. Complexity and sophistication of equipment.

2. Use of voice recognition applications.

3. US technological lead relative to other countries.

4. Level of government control of technology transfer to both friendly and unfriendly nations.

5. Use of computer equipment to evaluate the reliability, availability and maintainability of the equipment.

*Sociological (T 2600).*

1. Quality of high school graduates.

2. Quality of college graduates.

3. Number of students concentrating in mathematics and sciences.

4. Number of single parent families.

5. Ability of the Army to internally meet graduate level educational requirements.

Authors: LTC Stout/LTC Russell  
Team Chief: COL Dunn

## Appendix 3 to Annex II

### Delphi Questionnaire

**1. Purpose:** To present the DELPHI Questionnaire which was used to gather "expert" opinions about nominal forecasts of event probabilities and trend indexes.

**2. Discussion.** Attached as Tab A is the complete DELPHI questionnaire.

TAB A — Round 1 DELPHI Questionnaire.



DEPARTMENT OF THE ARMY  
OFFICE OF THE CHIEF OF STAFF  
WASHINGTON, D.C. 20310

DACS-PDOS


27 July 1984

SUBJECT: Round 1 DELPHI Questionnaire

SEE DISTRIBUTION

1. We sincerely appreciate your willingness to help us by completing the Round 1 Delphi questionnaire in preparation for our day-long Round 2 face-to-face session on 3 Aug 84. We ask that you have the questionnaire completed not later than 1200 on Monday 30 Jul 84. You may get the questionnaire to us by calling us and we will pick it up OR you may deliver it to us at the Cafritz Building on South Fern Street. We have a quiet conference room set aside for you if you need a place to complete the questionnaire.
2. The 3 Aug conference will not be at our "home" location in the Cafritz building. It will be in Hoffman Building II (where MILPERCEN is located) on Eisenhower Avenue (near Telegraph Road). The conference will be held in the Red Room, room 6N56. The meeting will begin at exactly 0800 and should be concluded at approximately 1800.
3. If you have any questions regarding location or parking, please call us. They are very strict on towing!
4. If you have any questions, call LTCs Dunn, Stout or Russell at 697-6550/6559/6560 (autovon prefix is 227).

Enclosure

  
CARL STOUT  
LTC, FA  
Chief, PDOS Futures Team

DISTRIBUTION:

DELPHI Participants

Tab A to Appendix 3



THE FUTURE OF THE US ARMY  
OFFICER PROFESSIONAL DEVELOPMENT SYSTEM (OPDS)

FROM 1984 TO 2025

DELPHI QUESTIONNAIRE--ROUND 1

## Part 1

### INTRODUCTION

One of the principal difficulties with conventional extrapolative forecasting methods is that they are generally incapable of dealing with unprecedented future events (e.g., surprises). Everyone knows that such developments will occur and should be taken into account. Methods that do attempt to include potential surprises create visions of the futures that happen to the organization (i.e., they do not explore the various policy responses likely to be initiated in anticipation of those surprises to create futures that happen for the organization).

The purpose of the study of the future is to identify and evaluate potential policy responses developed in response to credible information about likely futures. Of course, even in the most "surprise free" futures, there will always be some surprises -- wild cards, breakthroughs, novel compromises, plain stupidity, blind luck, unusual policy initiatives and the like. From a base of extrapolative forecasting of expected futures, this study builds more realistic futures that include potential surprises and leads to the identification and evaluation of specific policy responses. In this Round I questionnaire we are establishing a baseline for the study which will be used in the policy analyses to follow.

This questionnaire is designed to elicit your judgments on trends and events important to the future of the Officer Professional Development System (OPDS). The time horizon is the next 40 years (i.e., 1985 to 2025. Of course, no one can tell precisely the future that will materialize over the next 40 years, but everyone has a reasonably clear idea of a set of patterns and a small range of possible deviations which, taken together, give meaning to the phrase "most likely future." No doubt this is the image of the future that guides your everyday decisions on long-term issues. We ask you to keep this image of the "most likely future" in mind as you make your forecasts for the future of the trends and events in this

questionnaire. The "most likely future" is reflective of your expectations, not your preferences. Please be sure your answers reflect your expectations unless you are expressly asked about what "should be." The remainder of the questionnaire is divided into these parts:

Part 2: An evaluation of the future of trends descriptive of key issues important to OPDS.

Part 3: An evaluation of the future of potential events which may affect the future of these issues.

Part 4: An overall evaluation of various "strategic guidance" statements in light of your earlier evaluations.

Parts 2 and 3 each consist of two sub-parts. The first sub-part (Part 2.1) involves a macro-evaluation of all of the trends in our set. The second (Part 2.2) involves a detailed evaluation of a small selection of these trends. The sub-parts of Part 3 are corresponding evaluations for the events. In both Parts 2 and 3, you are asked to evaluate the specific items presented as written.

For some of the trends and events, you may feel very uncertain about your responses. There are several reasons for this uncertainty. You may find it difficult to forecast events in the long-term future at your usual confidence levels. You may be sufficiently knowledgeable in the subject of a trend or event to realize there is a great deal of uncertainty among the "experts" about its future. Do not allow these uncertainties to prevent your giving your best responses. If, however, you have no familiarity with the subject of a trend or event and have no basis for formulating your opinion, then skip the item.

This is an unclassified survey. Skip any item you cannot forecast without disclosing classified information.

In parts 2 and 3 you are also asked to suggest new ideas of equal or greater importance that you believe should be included. For example, most of the events and trends pertain to developments internal to the U.S. social, economic and political environment, as well as global issues, which may impact on internal developments. In your evaluations you may want to call attention to other pertinent

considerations which may affect these internal developments. Space is provided for possible additions. We particularly want your suggestions regarding trends or future events that are likely to be exceptionally beneficial to OPDS.

Move quickly through the questionnaire. Experiments have shown that your first impression is likely to be your best. Do not labor over any single answer.

You will note that we do not at any point request that you identify yourself nor is there any respondent code number. Your anonymity is your assurance that none of your opinions can or will be attributed to you. All individual responses will be held in confidence (i.e., our analysis of your response will only be presented in the context of the "group response"). The purpose of this anonymity is to encourage your free expression of opinion, however controversial, counter-intuitive or challenging to popular opinion or established policy.

You may want to make a copy of your completed questionnaire. Doing so will give you the opportunity to compare your responses to those of the group as a whole.

Part 2.1

EVALUATION OF KEY TRENDS

Your evaluation of each trend involves three steps:

First: An assessment of the current state of the trend and then an evaluation of its recent history (i.e., what it was in 1975).

Second: A forecast of its future at four points — 1990, 1995, 2005 and 2025.

Third: Evaluations of the positive AND the negative consequences for OPDS if your forecast actually materializes.

For many of the trends we have used a base line index of 100 for 1984. An index is generated by dividing whatever the actual current measure is -- whether number of students, gallons of oil, or dollars spent -- by itself and multiplying the result by 100. Your answer for an index in any year is some fraction or multiple of 100. If you believe the indicator in 1975 was  $\frac{2}{3}$  of what it is today, your response for that year would be 67. If you believe that the indicator will be 3.7 times larger than the current level in 2005, then your answer for that year is 370. Please note: an index can go to zero, but

not below it! Also, an index can move up, down, or remain level as the future evolves. Subjective measures (e.g., public support for the military) of the "actual" state of public opinion as an index in 1984, in 1975, and in the future years as it might be known to a perfectly informed observer. We want you to assume that you are such observer.

About 85 trends are presented in this section. Do the following for each trend: first, read and understand the trend statement, as well as its "Today" value. Do not mentally rewrite the trend. If you would like to rewrite a trend or suggest a better one, print your trend statement and then evaluate it in the space provided at the end of this section.

If a trend has no value for "Today," provide your estimate of the current value in the units indicated (e.g., percent, dollars, number, etc.) before proceeding to the historical (1975) estimate. For those trends with no 1975 data point, provide your estimate of the situation for the trend in 1975. If a 1975 data point is provided, use this historical information as background in making your forecasts for the future years.

While we tend to think of a trend as having either positive or negative consequences, it is rare for a trend to have only positive or only negative consequences; usually they both are present. In Question 2, estimate both the positive and the negative consequences for OPDS of each trend, on the assumption that your forecast actually materializes. Use any number on the scale of 0 to 10, with these basic benchmarks:

- 0 = No consequences
- 3 = Minor consequences
- 5 = Moderate consequences
- 7 = Major consequences
- 10 = Revolutionary, dramatic change

Note that "0" means "no consequences." We will interpret blanks to mean "no opinion."

This part of the trend section is designed for you to spend on average 60 seconds per trend. Please pace yourself accordingly.

Having completed your evaluation of the trends in the previous part, review your responses and circle the number of those three trends with the highest negative impact on OPDS and those three with the highest positive impact. If you have more than three negative (or positive) trends at your highest level of impact, select those three which you believe to be the most urgent and important for OPDS to address. These six trends will be used in this section of the questionnaire.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
T01. Competition between the Army, the private sector and other services for high-skill, high-aptitude personnel.		100							
T02. Percentage of Army officer positions requiring computer literacy.		100							
T03. Percentage of Army officers who are computer literate.		100							
T04. Percentage of women in the US Army.		100							
T05. Use of computers and satellites to deliver knowledge-base material, tests and "cook book" solutions to individual Army officers throughout the world, in peace or war.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.



Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
T06. Requirements for Army officers with engineering and technical skills.		100							
T07. Percentage of all Army officers who are deficient in basic educational skills.		100							
T08. Percentage of all Army officers for whom English is a second language.		100							
T09. Use of robotics in Army combat training (e.g., drones).		100							
T10. Ability to defend against and retaliate with chemical weapons.		100							
T11. Retention of Army personnel capable of maintaining high-tech equipment.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS* IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T12. Retention of Army personnel capable of <u>operating</u> high-tech equipment.		100						
T13. Assession and retention of Army instructors/mentors capable of training Army officers to use and maintain high-tech equipment.		100						
T14. Cost of Army officer training and education system in constant dollars.		100						
T15. Cost of civilian graduate and undergraduate education in constant dollars.		100						
T16. Conventional Army force capabilities.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T17. Extent to which senior Army commanders understand, use and integrate the full capabilities of high-tech systems.		100						
T18. Army use of computers to deliver instruction tailored to individual Army officer needs.		100						
T19. Percentage of Army officers who obtain fully-funded advanced degrees through non-resident instruction.		100						
T20. Amount of Army officer re-training required due to skill obsolescence.		100						
T21. Use of high quality, realistic simulations for Army officer training.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
	T22. Number of active component commissioned Army officers.		80,150						
T23. Number of active component Army warrant officers.		14,485							
T24. Total end-strength of active component Army personnel.		676,581							
T25. Total end-strength of reserve component Army personnel.		666,879							
T26. Congressional control of defense policy.		100							
T27. Size of gap between Army and civilian living standards.		100							
T28. Time available for the mobilization and deployment of the reserve component to reinforce active component units engaged in combat.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T29. Incidence of Army forces involved in joint/combined operations.		100						
T30. Ability of commanders to effectively use the increasing volume of information available for command and control decisions.		100						
T31. Amount of time available for Army command and control decisions.		100						
T32. Adequacy of the training of Army field commanders for continuous operations in an electronic warfare environment.		100						
T33. Capability of Army commanders and their staffs to operate effectively for sustained periods in mid- and high-intensity combat.		100						
T34. Cost to the Army of permanent change of station (PCS) relocation in constant dollars.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
T35. Interoperability of Army equipment with US allies' equipment.		100							
T36. Willingness of Army troops to follow the lawful commands of immediate superiors.		100							
T37. Percentage of Army equipment that is more expeditiously maintained in the field (e.g., modularized).		100							
T38. "User friendliness" (i.e., simplicity of operations) of Army weapon systems.		100							
T39. Army use of robotics and automation as force multipliers.		100							
T40. Reliability of high-tech Army equipment for sustained combat operations.		100							
T41. Vulnerability of Army communication systems on the battlefield.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)
	1975	TODAY*	1990	1995	2005	2025	
T42. Ability of Army personnel to use alternative approaches if high-tech equipment fails (i.e., electronic communications vs. messenger; fire planning by computer vs. "stubby pencil").		100					
T43. Reliance throughout the Army on external consultants/technical assistants.		100					
T44. Percentage of Army officers with PCs/terminals at home which are capable of supporting computer assisted instruction by telecommunications.		100					
T45. Percentage of Army officers with access to PCs/terminals at work which are capable of supporting computer assisted instruction by telecommunications.		100					
T46. Rate of modernization of Army equipment (including weapons).		100					

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate, is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T47. Size of gap between capabilities of part-time Army field grade officers and the requirements of the positions they would fill in war-time.		100						
T48. Ability of the Army to conduct highly mobile, tactical combat operations.		100						
T49. Degree of centralization of Army decision making on the battle-field.		100						
T50. Size of Army budget in constant dollars.		100						
T51. Aptitude of college graduates to learn high-tech skills.		100						
T52. US dependency on foreign sources for the acquisition of weapons.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "today," a percentage or an absolute value estimate is requested.



Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T53. Army's ability to continue combat operations on a contaminated battlefield.		100						
T54. Military build-up by third world countries.		100						
T55. Incidence of terrorism (world-wide) by radical factions and states.		100						
T56. Degree to which OPDS meets Army needs.		100						
T57. Soviet power projections in third world countries.		100						
T58. Level of tension between USSR and US.		100						
T59. Extent to which threat imposes a requirement that the Army be able to fight in vastly different physical environments.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
T60. Median age of US population.	28.7	1982-30.6 1984=							
T61. Number of 22-30 year olds who have graduated from college.		100							
T62. Number of 22-30 year olds who have science/engineering degrees.		100							
T63. Percentage of minority soldiers in Army combat units.		100							
T64. Unemployment rate of males.	4.4%	1980-6.4% 1984=							
T65. Degree to which Defense spending is forced below required mission levels due to increased expenditures for health, education, welfare and other transfer payments.		100							
T66. Level of Army esprit de corps.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T67. Rate of growth of lesser developed countries		100						
T68. US population of 17-20 year old males.		7.5M		6.7M	2002=8.2M 2005=			
T69. US population of 17-20 year old females.		7.3M		6.4M	2002=7.9M 2005=			
T70. Level of Congressional support for use of women Army officers in combat.		100						
T71. Availability of sophisticated video-disk training systems at unit level.		100						
T72. US national will to support military defense operations.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
	T73. Congressional support for the military.		100						
T74. Desire of politicians to take detailed control of tactical Army combat operations.		100							
T75. Influence of world peace movement organizations on US policies.		100							
T76. Capability of US industrial base to support prolonged combat operations.		100							
T77. US technological lead relative to potential adversaries.		100							
T78. Aptitude of high school graduates to learn high-tech skills.		100							
T79. Percentage of Americans aged 22-30 years with strong spiritual beliefs.		100							

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)	
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg
T80. Compatibility of value set of high school graduates with Army values.		100						
T81. Compatibility of value set of college graduates aged 22-30 years with Army values.		100						
T82. Quality of American public school system.		100						
T83. Quality of American higher education system.		100						
T84. Computer literacy of college graduates aged 22-30 years.		100						
T85. Ratio of ROTC scholarships to other student financial aid programs.		100						
T86. Number of Army officers with a working spouse.		100						

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 10)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	
T87. Army officer combat casualties as a percentage of all Army casualties.		100							
T88. Percentage of enlisted soldiers who complete educational requirements to become eligible for Officer Candidate School.		100							
T89. Percentage of Army officers with actual combat experience.		100							
T91. Impact of increased complexity of Army unit organizational structure on command and control practices.		100							
ON THE NEXT PAGE, ADD ANY EVENTS OF EQUAL OR GREATER IMPORTANCE!! BE SURE TO EVALUATE EACH OF YOUR ADDITIONS.									

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.1 PRELIMINARY ESTIMATE OF THE HISTORY AND FUTURE OF THE TRENDS

CANDIDATE TREND	1. LEVEL OF THE TREND IN...						2. CONSEQUENCES FOR OPDS IF THIS FORECAST ACTUALLY MATERIALIZED (0 to 1.0)		
	1975	TODAY*	1990	1995	2005	2025	Pos	Neg	

\*Note: "Today" = 100 because it is an index. If no value is shown for "Today," a percentage or an absolute value estimate is requested.

Part 2.2

IMPLICATIONS OF YOUR SIX TREND FORECASTS

FOR OPDS STRATEGIC GUIDANCE

In this part of the questionnaire, you are to evaluate the emphasis that should be placed on a number of "strategic guidance" statements for OPDS, in light of your forecasts of each of the six trends you have just selected. A short-hand version of the strategic guidance statements is used on the forms. The full version of most of these statements is presented on the next two pages. Read them carefully before completing the forms. The statements are among those developed for tentative policy guidance by the Professional Development of Officers Study (PDOS) group as broad guidelines derived from the OPDS philosophy. They are not a final set, but they will serve throughout the PDOS effort as a point of reference.

The question being asked is simple: If your projection of the trends proved to be accurate, what emphasis should have been given to these strategic guidance statements in order to ensure that OPDS met Army needs as effectively as possible? In some cases, no change may be appropriate. In others, it should



be easy to see in retrospect that a change from today's (1984) strategy would have been worthwhile. (Remember, we are assuming that your trend forecast has been accurate. You are thus looking back on the world from the point of view of a historian in the year 2026.) Each statement is presented in two extreme versions, representing the end points on a continuum, along which positions may be taken. This continuum is shown on an equal interval scale. Place an 'x' to indicate the position which you believe should be taken, given the future depicted by your trend forecast.

A separate form is provided for each of the six trends you selected. Be sure to write the number of the event in the space indicated.

STRATEGIC GUIDANCE STATEMENTS

1. OPDS STRUCTURE AND IMPLEMENTATION

The Officer Professional Development System (OPDS) should be structured and implemented based on individual development needs.

The Officer Professional Development System (OPDS) should be structured and implemented based on total Army requirements.

vs.

2. EQUALITY OF ARMY ASSIGNMENTS

All jobs are of equal importance to the Army.

Some jobs are more important to the Army than others.

vs.

3. OPDS EMPHASIS ON "FIST" vs. "MUSCLE"

OPDS should focus equally on field Army and support base requirements in developing officers.

OPDS should focus on the development of officers to meet field Army requirements.

vs.

4. OPDS INVESTMENT PRIORITY IN OFFICERS

The OPDS should give equal priority to the development of officers for staff positions

The highest priority of OPDS should be to develop officers prepared to assume command positions.

vs.

5. OPDS FOCUS IN OFFICER DEVELOPMENT

OPDS should focus on the preparation of officers to meet the skill demands of follow-on assignments up to the next career transition point.

OPDS should focus on long-term development of officers.

vs.

6. OPDS PRIORITY ON CONTINUED PROFESSIONAL DEVELOPMENT

Within OPDS, the opportunity for continued professional development should be weighted in favor of those with the greatest potential for continued service.

OPDS should provide the opportunity for continued professional development for all officers throughout their service.

vs.

7. OPDS PRODUCT

OPDS should insure that some offices are developed in depth in the general area of the art and science of warfare, and others as experts in functional areas.

vs.

OPDS should insure that all officers are developed broadly and also as experts in functional areas.

8. DISTRIBUTION OF OUTSTANDING OFFICERS

OPDS should be based on the premise that certain units/organizations should receive a higher proportion of officers fully qualified for promotion to the next grade.

vs.

OPDS should be based on the premise that all units/organizations receive an equal proportion of officers fully qualified for promotion to the next grade without compromising the requirement to assign officers qualified to perform the job.

9. OFFICER ROLE AS MENTOR AND ROLE MODEL

The officer's role as a mentor should be secondary to the traditional requirements associated with "training, maintaining, and mission accomplishment."

vs.

The officer should be first a mentor role model who instills Army values and develops subordinates as his most important responsibility.

10. BASIS OF OFFICER REWARDS

The Army should reward behavior that stresses personal success.

vs.

The Army should reward behavior that stresses organizational success.

11. MONITORING AND GUIDING OF OPDS

Monitoring of the OPDS and identification of changes required should be accomplished by occasionally convening study groups such as RETO and PDOS.

vs.

The OPDS should include a self-correcting mechanism for regular, periodic collection and analysis of data to identify required changes in the system.

12. FINAL DECISIONS ON OPDS MADE BY:

The final authority for officer training and education decisions impacting on the entire Army (i.e., increases in transients, hospital, and school account) should reside at HQDA.

vs.

The final authority for officer training and education decisions impacting on the entire Army should reside at TRADOC.

Item 13 addresses the issue of who should be fundamentally responsible for officer education, training, and socialization. Here we present a grid that interrelates these three major activities with the various sources that might provide them. You are to provide an answer for officers in each of four career stages. In the example below, the respondent indicated that, if a particular trend forecast had proven correct in the future, the Army should have prepared officers by doing the following:

- o For precommissioned officers cadets and candidates ("1's" on the scale): assigning primary responsibility for their education to civilian educational institutions; training to precommissioning schools; and socialization to the individual. ("Socialization" is the process by which officers acquire the values, attitudes, and behaviors appropriate for the Army roles they assume.)
- o For lieutenants and captains ("2's" on the scale): assigning primary responsibility for their education to Officers Basic Course (OBC); training to OBC; and socialization to the individual.
- o For majors and lieutenant colonels ("3's" on the scale): assigning primary responsibility for their education to Officers Advanced Course (OAC); training to units/organizations; and socialization to units/organizations.

Since colonels ("4's" on the scale) are not indicated in this example, this means that the respondent saw no change from today's (1984) assignment of primary responsibility for them in the future world depicted by the forecasted trend.  
 Note: "CGSC" refers to the Command and General Staff College; "SSC" refers to Senior Service Colleges (e.g., the Army War College).

13. LEAD RESPONSIBILITY FOR EDUCATION, TRAINING, AND SOCIALIZATION

TYPE	PRIMARY RESPONSIBILITY							
	The individual	Civilian educational instn.	Units/Organizations	Pre-Comm.	OBC	OAC	CGSC	SSC
Education		1			2	3		
Training			3	1	2			
Socialization	1,2		3					

CAREER STAGES:

- 1 = Precommissioned cadets and candidates
- 2 = Lieutenants and Captains
- 3 = Majors and Lieutenant Colonels
- 4 = Colonels

(Note: There can be more than one number in a block.)



Part 3.1

PRELIMINARY EVALUATION OF FUTURE EVENTS

As suggested in the general introduction to this questionnaire, even the best mathematical trend projections are certain to miss the mark eventually, since they rest on the fatal assumption that the future is a function of the past. They cannot take account of two very important classes of developments: things that stop happening and things that happen for the very first time. In a study like this, it is crucial to be explicit about such possibilities in order to enhance the realism and plausibility of the final forecasts. In this part of the questionnaire, you are to provide your judgments about a large number of such events.

On the forms that follow, you will find about 100 events. At the end of the listing you will find space to add ideas of your own, and we hope that you will suggest additional candidates that strike you as being at least as significant as those provided for your evaluation.

For each event—our candidates and your additions—you are to answer four questions. Trust your intuition and move as quickly as possible from question to question. You should allow yourself about 45 seconds to provide all judgments on each event.

Question 1 seeks your forecast of the probability of each event in the "most likely" future over the next 40 years. Use a scale of 0 to 100, where "0" means "will not happen at any point in the next 40 years" and "100" means "it will happen at some point in the next 40 years." If your answer to Question 1 is "0," skip Question 2 and go to Questions 4 and 5.

Question 2 asks you to distribute your forecast probabilities for the next 40 years into four time periods:

Today to 1990  
1990 to 1995  
1995 to 2005  
2005 to 2025

The sum of your four answers here will equal your initial forecast from Question 1. If you believe the event is more likely to occur early in the next 40 years, then more of your initial forecast will go into the first and second time periods. If you believe it has more chance later, put more of the initial probability in the later periods. If you believe it has an equal chance of happening in each of the next 40 years, write "Equal" across the four time periods. For example, suppose for a given event your answer to Question 1 is "63." Also, your forecast is that this is unlikely in the first twenty years, but has a real chance after 2005. Your distribution of this initial probability across the four time periods might read: "0," "4," "6," and "53." If your forecast were that the event's real chance were soon, the order might be reversed. Note, a "0" in an interval means, "the event will not happen in this time period."

Question 3 seeks your estimate of the year in which the event has the first slight chance of occurring in the "most likely" future. What was the earliest interval in Question 2 in which you distributed a portion of your initial probability? A specific year in this interval is the answer to the present question.

Question 4 asks for your estimate of how long it would take after the occurrence of the event for its first serious impacts to be felt on OPDS. (The word "mission" is used here as a blanket term to cover all aspects of OPDS operations and responsibilities.) This estimate should be provided in years (or fractions thereof). A zero would mean that serious effects would be felt immediately. Leave Question 4 (and 5) blank if you feel that the occurrence of the event would never affect OPDS, directly or indirectly.

Question 5 asks for your estimates of both the positive and the negative impacts on a key trend ("the ability of OPDS to meet Army needs"). These estimates are of precisely the same sort as those you made when evaluating the trends in Part 2.1, and the same scale should be used. As with the trends, zeros should be used if you mean "no impact." We will interpret blanks to mean "no opinion."

PART 3.1.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
		Today	1990	1995	2005			Pos	Neg
		to 1990	to 1995	to 2005	to 2025				
E001. Army implements a computerized career information data base available to all ROTC cadets and officers.									
E002. Congress reinstates the GI Bill for education.									
E003. All Army officers are required to take periodic skill qualification tests.									
E004. At least five states provide tuition-free college education.									
E005. An accurate and credible measure of Army officer potential is developed.									
E006. An effective and credible system for matching Army officer abilities with Army requirements is developed.									



Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS			3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	4. IF THE EVENT ACTUALLY OCCURS, WHAT TIME WILL IT OCCUR?	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
		Today to 1990	1990 to 1995	1995 to 2005			2005 to 2025	Pos
E007. US involved in an armed conflict in which nuclear weapons are exchanged.								
E008. A US Army officer in the field initiates a successful unauthorized launch of a nuclear weapon against the USSR (US and USSR are not in armed conflict).								
E009. Army requires satisfactory test of English as a foreign language for entry in the officer corps.								
E010. Army raises maximum induction age to 30 years.								
E011. Full mobilization of Army reserve component occurs.								
E012. Active component Army officers are assigned to command reserve component battalions.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (C to 100)		2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS	
	Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)			
						Pos		Neg	
E013. US involved in mid- to high-intensity conventional armed conflict with a major power.									
E014. Terrorists sabotage nuclear power plant in US resulting in the release of nuclear waste into the atmosphere.									
E015. US involved in a low-intensity conventional armed conflict with a minor power.									
E016. US involved in an armed conflict in which chemical weapons are exchanged.									
E017. US and China sign a mutual defense treaty.									
E018. US involved in an armed conflict in which biological weapons are exchanged.									

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PRO- BABILI- TY OF THE EVENTS BY 2025 (0to100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 Y.ARS IN EACH OF THESE INTERVALS			3. YEAR THAT PROBA- BILITY IS LIKELY TO EX- CEED 0%	IF THE EVENT ACTUALLY OCCURS	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
		Today to 1990	1990 to 1995	1995 to 2005			
E019. Reserve component Army officers are excluded from field grade positions because they are deficient in skills required to integrate high-tech weapons systems.							
E020. The US is involved in an international confrontation at least as dangerous as the Cuban Missile Crisis in 1962.							
E021. Terrorists detonate a nuclear device in a US city.							
E022. A nuclear weapon controlled by one of the major nuclear powers (i.e. the US, USSR, UK, France or PRC) detonates accidentally within that country's borders.							
E023. Non-nuclear armed conflict breaks out between a major power allied to the US and some lesser nation raising the grave danger that the conflict may escalate into World War III.							

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PRO-BABILI- TY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS			3. YEAR THAT PROBA- BILITY IS MOST LIKELY TO EX- CEED 0%	IF THE EVENT ACTUALLY OCCURS		
		Today to 1990	1990 to 1995	1995 to 2005		2005 to 2025	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
E024. Army officer evaluation report system changed to include input from superiors, peers and subordinates.								
E025. Army ends "joint domicile" assignment policy.								
E026. Army increases length of Battalion/Brigade command tours to 36 months.								
E027. An international military force is established to guarantee world peace and enforce UN and World Court decisions.								
E028. Army restructures to elimin- ate two higher echelons (division & corps) of command and control.								
E029. At least two major powers withdraw from both the civilian and military arms of NATO.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS			3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS	
		Today to 1990	1995 to 2005	2005 to 2025		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
E030. Korea is reunified peacefully.						Pos	Neg
E031. Army implements a two officer corps system like the Navy (e.g., a line and a staff promotion system).							
E032. West Germany and East Germany are unified peacefully.							
E033. China and USSR reestablish full economic and political ties.							
E034. Techniques for imparting information from computers directly into human memory during periods of REM sleep are available commercially.							
E035. Mexico joins the communist block.							

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	4. IF THE EVENT ACTUALLY OCCURS	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
							Pos	Neg
E036. Direct commissions to MAJ and Lt Col are granted to civilian specialists in technical fields experiencing shortages of officers.								
E037. France rejoins military arm of NATO and replaces 5th US Corps along German border (5th US Corps returns home).								
E038. All single parents in the Army with dependents receive a mandatory release from active duty.								
E039. Army unit size is reduced sufficiently to create new command opportunities.								
E040. Army procurement policies are changed to reduce equipment acquisition time.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS						3. YEAR THAT PROBABILITY IS LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS		
	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)		1990 to 1995		1995 to 2005			4. TIME TO IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
	Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025	Pos	Neg				
E041. At least 70% of all US college students are required to use personal computers as part of their college training.										
E042. Credible brainwave measure of cognitive skills is developed.										
E043. Congress prohibits citizenship for foreign nationals unless they serve in the US military.										
E044. US experiences dramatic flood of refugees from Central and South America.										
E045. A major depression occurs in the US (i.e., the national unemployment rate exceeds 15 percent for at least four consecutive years).										
E046. Army fields first ground-to-ground and ground-to-air weapon firing systems controlled by neuro-optics (eyeball controlled).										

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS		
		Today	1990	1995	2005		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
		to 1990	to 1995	to 2005	to 2025			Pos	Neg
E047. Congress institutes a draft for reserve components.									
E048. Congress institutes a draft for active component.									
E049. President directs Army troops to patrol border between US and Mexico.									
E050. Reserve components comprise total US commitment to NATO.									
E051. US military services are combined into one uniformed service (e.g., Canadian military system).									
E052. US media mounts extensive anti-military campaign in response to US military involvement in a 3rd world country.									



Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)		5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
	Today to 1990		1995 to 2005			Pos	Neg	
	1990	1995	2005	2025				
E053. South Africa invaded by a neighbor; US joins in defense.								
E054. All non-military government scholarship funds for college students are cut by at least 75%.								
E055. Large private corporations establish lucrative college student financial aid packages with follow-on employment obligations.								
E056. USSR builds weapon platforms in outer space.								
E057. At least 75% of all major universities offer a full range of graduate degree programs via national educational computer network.								
E058. Anti-gravity devices are developed.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
E059. A commercially viable technology is demonstrated that permits the emergence of a "hydrogen economy" and a major reduction in dependence on fossil fuels.							Pos	Neg
E060. An anti-technology movement more intense than any known to date emerges throughout the US to block certain lines of physical and biological research and halts further automation of work.								
E061. A free-access national computer network is established by the federal government.								
E062. Biological technologies are developed that facilitate rapid learning.								
E063. Genetic engineering breakthrough provides an abundant, inexpensive food source.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILI- TY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBA- BILITY IS LIKELY TO EX- CEED 0%	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)		5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		Pos	Neg	
		1990	1995	2005	2025				
E064. Breakthrough that enables anyone to exercise mind control of intense physical pain.									
E065. Army fields computerized decision support system (i.e., resource management database with user friendly decision aids) which is available to all commanders at company level and above.									
E066. Precognition (e.g., clairvoyance) and remote viewing (e.g., out-of-body experience) technology available.									
E067. Scientists develop communication system which is not vulnerable to electromagnetic pulse from nuclear detonations or electronic countermeasures.									
E068. New developments in transportation cut travel time between US and Europe to two hours.									

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)		5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
	1. PROBABILITY OF THE EVENTS BY 2025 (0to100)		Today to 1990	1990 to 1995		1995 to 2005	2005 to 2025	Pos	Neg
	Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025					
E069. Army produces man-portable, "smart"/electronic maps able to determine convoy routes, terrain features, etc., and display them graphically on a small computer system.									
E070. Army fields staff-oriented, electronic wargames for training.									
E071. Japan re-arms.									
E072. China invades Taiwan.									
E073. Army fields hand-held electronic field manuals.									
E074. The number of nations known to possess nuclear weapons reaches 10 and sparks massive world-wide demonstrations for nuclear freeze and disarmament.									

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR OI PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS...				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS...	
		Today to 1990	1995 to 2005	2005 to 2025	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)		5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
		1990 to 1995	2005 to 2005	2025 to 2025	Pos			Neg
E075. A country led by an irrational head of state acquires an operational nuclear capability.								
E076. Psychologists perfect hypnotic techniques allowing a 90% success rate in changing attitudes and eliminating undesirable habits.								
E077. Army ROTC programs are dropped by approximately 50% of participating universities.								
E078. Public school systems adopt new learning techniques which virtually eliminate all intellectual deficiencies caused by early-childhood cultural deprivation.								
E079. Tens of thousands of deaths are caused by an acute contagious disease that sweeps the US.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS 15% LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
							Pos	
E080. An all-out bacteriological attack kills significant portion of US population.								
E081. The Federal government establishes a system of free universities to provide college education in exchange for federal work commitment which can be fulfilled by military service.								
E082. Congress establishes a policy of pro-rating federal education aid to states based upon student improvement demonstrated on national competency exam.								
E083. An anti-military President takes office.								
E084. Congress refuses to fund production of a major nuclear weapon system.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PRO-BABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS...				3. YEAR THAT PROBABILITY IS LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS.	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		4. TIME TO IST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
							Pos	Neg
E085. Congress authorizes the use of active duty military forces to control wide spread riots in US.								
E086. To counter the detrimental effects caused by rapid information and skill obsolescence, at least ten additional professional occupations require continual education throughout an Army officer's career to maintain proficiency.								
E087. Congress mandates longer "time in service" before military retirement eligibility.								
E088. Congress mandates the removal of all restrictions on the assignment and utilization of women.								
E089. A verifiable mutual freeze on nuclear weapons production and deployment is agreed upon by the US and the USSR.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS...				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS...	
		Today to 1990	1995 to 2005	2005 to 2015	2015 to 2025		4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
E090. Fifty percent of all American homes are equipped with interactive cable TV systems to provide complete, self-paced college degree programs sponsored by major universities.							Pos	Neg
E091. Medical breakthrough in neurotransmitter research provides drugs which increase average human memory capacity by 50% and improve average accuracy of recall/retrieval by 75%.								
E092. US withdraws from military and civil arms of NATO.								
E093. Congress mandates withdrawal of a large number of troops from foreign soil (e.g., Europe, Korea or Central America).								



Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PRO- BABILI- TY OF THE EVENTS BY 2025 (0to100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBA- BILITY IS 1ST LIKELY TO EX- CEED 0%	IF THE EVENT ACTUALLY OCCURS	4. TIME TO 1ST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025				Pos	Neg
E094. At least 75% of US adults complete some form of formal education/training program annually.										
E095. Genetic engineering researchers provide reliable and relatively inexpensive procedures for increasing the average intelligence of new-born children by at least 15 IQ points.										
E096. Congress mandates at least two years of national service (either civilian or military) for all 18 year olds.										
E097. Army implements a <u>unit</u> performance incentive plan.										
E098. Congress approves a new performance based pay system for Army officers (as opposed to the current system of "grade" and "time in service").										

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)	2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS...				3. YEAR THAT PROBABILITY IS MOST LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS...	
		Today to 1990	1990 to 1995	1995 to 2005	2005 to 2025		4. TIME TO IST IMPACT ON OPDS MISSION (years)	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)
E099. Congress adopts a vested retirement system (e.g., soldiers can leave the service early and receive reduced retirement pay).							Pos	Neg
E100. Congress reduces retirement pay by amount of Social Security benefits when individual becomes eligible for social security.								
ON THE NEXT PAGE, ADD ANY EVENTS OF EQUAL OR GREATER IMPORTANCE!!! BE SURE TO EVALUATE EACH OF YOUR ADDITIONS.								

Part 3.1 PRELIMINARY EVALUATION OF FUTURE EVENTS

CANDIDATE EVENT	1. PROBABILITY OF THE EVENTS BY 2025 (0 to 100)				2. DISTRIBUTION OF YOUR Q1 PROBABILITY OVER THE NEXT 40 YEARS IN EACH OF THESE INTERVALS				3. YEAR THAT PROBABILITY IS LIKELY TO EXCEED 0%	IF THE EVENT ACTUALLY OCCURS	5. OVERALL IMPACT ON ABILITY OF OPDS TO MEET ARMY NEEDS (0-10)	
	Today	1990	1995	2005	Today	1990	1995	2005			Pos	Neg

Part 3.2

IMPLICATIONS OF SOME EVENTS  
ON THE "STRATEGIC GUIDANCE" STATEMENTS

Review your answers to Question 4 in the previous section concerning the impacts of the occurrence of the events. Find the two events having the highest negative impact and the two having the highest positive impact. (If there are ties, break them yourself according to their urgency or importance to OPDS.) These four events are the subject of this part of the questionnaire.

In this part you will evaluate the emphasis that should be placed on a number of "strategic guidance" statements for OPDS, in light of the potential occurrence of each of the four events you have just chosen. Note: the question being asked is different from the one you answered in evaluating the strategic guidance relative to your forecasted trends. In that case you were a historian looking backward. Here you are a clairvoyant looking forward. Specifically: If it were known that the event was going to occur, how should the emphasis on these guidelines be changed beforehand to better ensure that OPDS can continue to meet Army needs effectively? In some cases, no change from the today's (1984) level may be appropriate. Skip these items. In other cases, an effort to be pro-active may well be worthwhile. If, for example, one of the events you have chosen is negative in its impacts, the emphasis might be shifted to minimize or avoid harmful effects. If the event is positive, the emphasis might be shifted to take better advantage of the benefits of the occurrence of the event when it happens.

A separate form is provided for each of your four events. Be sure to write in the number of the event you are dealing with in each case.

Part 3.2 EVALUATION OF THE POTENTIAL IMPACT OF AN EVENT ON OPDS STRATEGIC GUIDANCE STATEMENTS

**WRITE THE EVENT NUMBER IN THIS SPACE**  Shown below are 13 "strategic guidance" statements for OPDS. Each of them, except 12 and 13, is presented as a scale between two extremes. The question is this: Where should the emphasis be placed to ensure that OPDS is best prepared if: the event you are dealing with were actually to occur? Answer by placing an "X" at the appropriate point on each scale. For item 12, check the appropriate box. For item 13, see the detailed instructions at the beginning of this part. Skip an item which you believe would not be affected by the occurrence of the event.

1. OPDS STRUCTURE & IMPLEMENTATION  
Based on internal needs :-----:-----:-----:  
Based on total Army requirements
2. EQUALITY OF ARMY ASSIGNMENTS  
All jobs equally important :-----:-----:-----:  
Some jobs more important than others
3. OPDS EMPHASIS ON "FIST" vs "MUSCLE"  
Support base requirements :-----:-----:-----:  
Field Army requirements
4. OPDS INVESTMENT PRIORITY IN OFFICERS  
potential for staff :-----:-----:-----:  
Potential for command
5. OPDS FOCUS IN OFFICER DEVELOPMENT  
skill needs for next assignment :-----:-----:-----:  
Long-term development
6. OPDS PRIORITY IN CONTINUED PROFESSIONAL DEVELOPMENT  
Most promising officers only :-----:-----:-----:  
All officers
7. OPDS PRODUCT  
Either a specialist or a generalist :-----:-----:-----:  
All generalists but each with a specialty
8. DISTRIBUTION OF OUTSTANDING OFFICERS  
limited to certain units :-----:-----:-----:  
Equally to all units
9. OFFICER ROLE AS MENTOR & ROLE MODEL  
Least important responsibility :-----:-----:-----:  
Most important responsibility
10. BASIS OF OFFICER REWARDS  
Personal success :-----:-----:-----:  
Organizational success
11. MONITORING & GUIDING OF OPDS  
Ad hoc study groups :-----:-----:-----:  
Formal internal self-correcting mechanism
12. FINAL DECISION ON PDOS MADE BY  
-----:-----:-----:  
HQDA ----- MACOM

13. LEAD RESPONSIBILITY FOR EDUCATION, TRAINING, AND SOCIALIZATION

TYPE	PRIMARY RESPONSIBILITY						
	The individual	Civilian educational instn.	Units/Organizations	MILITARY SCHOOLS			SSC
				Type-Comm.	DBC	DAC	
Education							
Training							
Socialization							

CAREER STAGES:

- 1 = Precommissioned cadets and candidates
  - 2 = Lieutenants and Captains
  - 3 = Majors and Lieutenant Colonels
  - 4 = Colonels
- (Note: There can be more than one number in a block.)

Part 4.0

OVERALL ASSESSMENT OF THE PRESENT AND FUTURE LEVELS  
OF THE "STRATEGIC GUIDANCE" STATEMENTS

A single form, with its own instructions, is presented on the following page. As indicated, we ask you once again to review the strategic guidance statements. This time, however, we ask that you mentally integrate and synthesize all of the specific trends and events you have considered in this questionnaire, and then give us your overall estimate of the level of emphasis placed on the strategic guidance statements — what the situation is today (1984) and what it should be over the foreseeable future. In each case, we seek your net estimate across all trends and events.

Note that two estimates are for statements 1-11:

a "T" indicates today's level

and an "F" indicates the desirable future level.

Write these letters on the scales to indicate your two estimates. On statements 12 and 13, estimate only the future ("F") level.

\* \* \*

When you have completed this part, you will have completed the questionnaire. We thank you for your participation, and we look forward to your contributions in Round 2. As noted earlier, you may want to make a copy of your responses for comparison with the group responses.



## Appendix 4 to Annex II

### Significant Events And Trends In PDOS INTERAX Model

In preparation to conduct computer-assisted policy impact analysis, the PDOS Futures Team asked selected experts in long-range planning for their opinion as to the cumulative probability of occurrence of approximately 110 events and the forecast of trend level of approximately 90 trends which could define and potentially impact on the officer professional development system from 1985 to 2025.

This appendix presents the significant consensus as to event probabilities and trend levels for those events and trends which appear in the "final" PDOS INTERAX model.

The "cumulative probability" for events is the probability that the event could occur by 2025. The "forecast of trend level" for trends is the "2025" deviation for that trend from an assumed current level.

#### Cumulative Probability of Occurrence by 2025 Of Most Probable Events

<u>Cumulative Statement</u>	<u>Event Number</u>	<u>101 Probability Event</u>
.99	29	Army 21 is adopted.
.99	33	Army establishes minimum entrance requirements for officers.
.99	42	Electronic data base is installed throughout the Army.
.99	46	Army installs Communications-Computer Based Instruction for use in schools, units and the home.
.99	48	Self-assessment testing program is installed for officers at Army schools.
.99	73	Super-powerful hand-held computers are developed and made available to all officers, free.
.99	84	Requirements are established for all officers to receive military schooling at most ranks.
.99	98	Rapid increase in modernization of equipment occurs similar to 1980's increase.
.95	22	Army combat units have TOE positions calling for other Service MOSs; other Services assign their personnel to them. .9070 Additional electronic wargames fielded for training.
.90	83	Formalized officer professional development program is established.

#### Cumulative Probability of Occurrence by 2025 Of Least Probable Events

<u>Cumulative Probability</u>	<u>Event Number</u>	<u>Event Statement</u>
.01	8	Unauthorized nuclear launch by US Army field commander occurs.
.08	51	US military forces are combined.
.15	64	Two languages required of all officers.
.15	6	Army protects domestic facilities.
.20	67	Permanent international military force is established.
.21	50	Reserves assigned total US military commitment to NATO.
.21	71	5th generation computer is developed by Japan.
.21	78	Educational deficiencies are eliminated.
.25	77	50% drop in universities participating in Army ROTC.
.26	30	US withdraws from NATO.
.26	35	Mexico turns communist.
.26	37	France rejoins NATO.



**Forecast of Trend Level by 2025:  
Most Dramatic Increases**

<u>Forecast of Trend Level</u>	<u>Trend Number</u>	<u>Trend Statement</u>
15.0	3	Percent officers with ability to use computers effectively (read forecast as 15 times today's trend level -what ever it may be).
10.0	2	Percent officer positions requiring computer use.
4.0	44	Percent officers with computer terminals at home.
2.0	20	Officer retraining requirements due to their skills being obsolete.
1.95	29	Percent of Joint/combined operations involving Army units.
1.88	46	Rate of modernization of Army equipment.
1.85	34	Cost of PCS moves due to training and education requirements.
1.5	04	Percent women in the Army.
1.5	01	Loss of officers to civilian sector.
1.40	47	Gap between capabilities of reserve and active duty officers.

**Forecast of Trend Level by 2025:  
Most Dramatic Decreases/Least Dramatic Increases**

<u>Forecast of Trend Level</u>	<u>Trend Number</u>	<u>Trend Statement</u>
.80	7	Percent officers deficient in basic skills at entrance into officer corps.
.85	53	No. officers in active component "TDA" Army.
.97	19	Gap between US and USSR technology.
1.00	72	US national will to support military operations.
1.03	52	No. enlisted personnel in active component Army.
1.03	67	Ability of junior officers to replace senior officers.
1.05	55	No. active component officers in "TOE" Army.
1.05	73	Congressional support for the military (a measure of Congressional will).
1.25	51	Lieutenants' average skill/aptitude level upon entry on active duty.
1.30	33	Commanders' ability in midto highintensity combat.

## Appendix 5 to Annex II

### Analysis Of Events And Trends Entered Into The INTERAX

#### 1. PURPOSE.

a. To present the analysis of event and trend data which were obtained from all rounds of the DELPHI process.

b. To present the computer program which was specially created to analyze DELPHI data.

2. Discussion. Attached at Tab A is the complete set of data as obtained from the DELPHI process and entered in the INTERAX program. The final data in the INTERAX model has some of the DELPHI data still in it. Most of the final model, however, does not contain DELPHI data.

a. Pages II-5-A-1 thru II-5-A-17 are the Event analysis. The following is a description of how to read the data:

(1) Column 1: Responds to the question: What is the probability that this event will occur by 2025?

(2) Column 2: Responds to the question: How much of the column 1 probability will occur between today (1984) and 1990?

(3) Column 3: Responds to the question: How much of the column 1 probability will occur between 1990 and 1995?

(4) Column 4: Responds to the question: How much of the column 1 probability will occur between 1995 and 2005?

(5) Column 5: Responds to the question: How much of the column 1 probability will occur between 2005 and 2025?

(6) Column 6: Responds to the question: What is the year that the probability first exceeds 0%?

(7) Column 7: Responds to the question: If the event actually occurs, how many years will pass from the occurrence of the event until it first impacts on the officer professional development system mission?

(8) Column 8: Responds to the question: If the event actually occurs, what will be its overall positive impact on the ability of the officer professional development system to meet the Army's needs (scale is 0 to + 10).

(9) Column 9: Responds to the question: If the event actually occurs, what will be its overall negative impact on the ability of the officer professional development system to meet the Army's needs (scale is 0 to -10).

(10) Row 1: The single maximum score for each column.

(11) Row 2: The mean of scores for each column. The mean of scores were entered into the INTERAX data base for the initial, trial computer simulations. These data, however, may not be in the final model.

(12) Row 3: The median of scores for each column.

(13) Row 4: The single minimum score for each column.

(14) Row 5: The standard deviation of the mean of all scores for each column.

(15) Row 6: The number of respondents indicating that this event will "never occur." Accurate data were not kept as to the total number of respondents —there were approximately 30.

b. Pages II-5-A-18 thru II-5-A-32 are the Trend analysis. The following is a description of how to read the data:

(1) Column 1: Responds to the question: Assume that today's (1984) trend level is what you see in column 2, what was that trend level in 1975?

(2) Column 2: This is the assumed trend level for 1984. This data was provided to each respondent. Note: the standard deviation in all cases is "0."

(3) Column 3: Responds to the question: What will the trend level be in 1990?

(4) Column 4: Responds to the question: What will the trend level be in 1995?

(5) Column 5: Responds to the question: What will the trend level be in 2005?

(6) Column 6: Responds to the question: What will the trend level be in 2025?

(7) Column 7: Responds to the question: What will be the positive consequences for the officer professional development system if this forecast actually materializes (scale is 0 to + 10)

(8) Column 8: Responds to the question: What will be the negative consequences for the officer professional development system if this forecast actually materializes (scale is 0 to -10).

(9) Row 1: The single maximum score for each column.

(10) Row 2: The mean of scores for each column.

(11) Row 3: The median of scores for each column. The median of scores were entered into the INTERAX data base for the initial, trial computer simulations. These data, however, may not be in the final model.

(12) Row 4: The single minimum score for each column.

(13) Row 5: The standard deviation of the mean of all scores in each column.

c. Pages II-5-A-33 thru II-5-A-38 is the computer program which was specifically designed to analyze the DELPHI data. Other more powerful programs are available such as SPSS. This program appears in this Appendix as an historical document.

Tab A — Extracted INTERAX Data

NOMINAL EVENT CUMULATIVE PROBABILITIES TAKEN FROM ALL ROUNDS OF PDOS DELPHI. THIS DATA WAS ENTERED INTO THE INTERAX DATA BASE FOR THE INITIAL WORK WITH THE MODEL. THIS DATA IS NOT IN THE FINAL PDOS INTERAX MODEL.

EVENT

1	2	3	4	5	6	7	8	9
Probability by 2025 / 1990	Probability by 1984-1990 / 1995-2005	Distribution of Pr. 1990-1995 / 2005-2025	Year Pr. Goes Above 0%	1st Impact on OPDS/Army Needs (0-10)	Overall Impact on OPDS' Ability to Meet Army Needs (0-10)			
MAX 100	30	31	30	50	2025	3	2	10
MEAN 45	6	11	14	14	1993	2	0	7
MDN 38	0	5	12	10	1990	2	0	7
MIN 0	0	0	0	0	1984	0	0	5
SD 38	10	13	13	15	12	1	1	2

1 An anti-military President takes office.

3 NEVER

2 Congress reinstates the GI Bill for education.

MAX 100	100	80	50	30	1985	5	6	2
MEAN 56	20	20	11	11	1986	2	0	10
MDN 60	10	20	10	0	1990	2	7	2
MIN 0	0	0	0	0	1985	0	3	0
SD 37	28	20	14	9	3	2	2	2

4 NEVER

3 Army officers (WOL-06) are required to take periodic skill qualification tests.

MAX 99	10	99	30	60	2004	2	9	2
MEAN 48	4	22	13	12	1994	2	6	2
MDN 55	0	21	15	10	1993	2	6	2
MIN 0	0	0	0	0	1988	0	0	0
SD 33	4	27	10	17	4	1	2	1

1 NEVER

4 Congress refuses to fund production of a major nuclear weapon system.

MAX 100	100	50	50	43	2006	5	3	9
MEAN 74	28	21	14	13	1989	1	1	4
MDN 97	20	20	11	8	1982	1	0	5
MIN 0	0	0	0	0	1984	0	0	0
SD 34	30	15	14	14	5	2	1	4

1 NEVER

5 An accurate and credible measure of Army officer potential is developed.

MAX 100	25	60	25	50	2010	10	10	7
MEAN 33	4	11	8	10	1994	4	7	2
MDN 30	0	4	7	10	1990	3	7	3
MIN 0	0	0	0	0	1989	0	3	0
SD 29	6	17	8	12	7	3	2	2

5 NEVER

Tab A to Appendix 5  
Extracted INTERAX Data

EVENTS - ORDERED BY EVENT NUMBER

EVENT

1 2 3 4 5 6 7 8 9

Probability by / Distribution of Pr. / Year Pr. / Ist / Overall Impact on  
 2025 / 1990 1995 2005 1995-2005 / Goes / Above 0% / on OPDS / OPDS' Ability to Meet  
 2025 / Army Needs (0-10)

MAX 100  
 MEAN 58  
 MDN 75  
 MIN 0  
 SD 34

6 An effective and credible system for matching Army officer abilities with Army requirements is developed.

100 50 50 94 2015 5 10 7  
 11 16 1994 2 7 2  
 3 10 1990 2 7 3  
 0 0 1984 0 4 0  
 24 13 19 25 8 2 2 2

3 NEVER

MAX 99  
 MEAN 22  
 MDN 10  
 MIN 0  
 SD 26

7 US involved in an armed conflict in which nuclear weapons are exchanged.

50 36 10 2000 2 5 10  
 6 6 2 1990 0 7 7  
 0 5 0 1990 0 0 9  
 0 0 0 1984 0 0 0  
 14 12 9 5 5 2 3

5 NEVER

MAX 100  
 MEAN 14  
 MDN 1  
 MIN 0  
 SD 25

8 A US Army officer in the field initiates a successful unauthorized launch of a nuclear weapon against the USSR (US and USSR are not in armed conflict).

25 25 25 25 2005 2 2 10  
 3 4 4 4 1988 1 0 6  
 0 0 0 0 1986 0 0 9  
 0 0 0 0 1984 0 0 0  
 7 6 8 6 6 1 1 4

9 NEVER

MAX 100  
 MEAN 51  
 MDN 55  
 MIN 2  
 SD 28

9 Congress authorizes the use of active duty military forces to control riots in US.

10 45 25 75 1996 12 5 7  
 12 15 20 1992 2 1 5  
 8 11 13 1993 1 1 5  
 0 2 0 1987 0 0 4  
 14 7 20 3 3 1 1

0 NEVER

MAX 100  
 MEAN 83  
 MDN 100  
 MIN 0  
 SD 27

10 Congress mandates longer "time in service" before retirement eligibility.

50 69 50 50 1995 6 10 8  
 19 28 24 13 1989 2 5 4  
 20 30 25 5 1989 2 6 3  
 0 0 0 0 1984 0 3 0  
 15 16 15 15 3 1 2 3

1 NEVER

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probability by Distribution of Pr. / Year Pr. / Overall Impact on								
	1984-1990 / 1995-2005 / 2005- / Goes / Impact / OPDS' Ability to Meet								
	2025 / 1990 / 1995 / 2005 / Above 0% / on OPDS / Army Needs (0-10)								
11 Full mobilization of Army reserve component occurs.	MAX 90	29	60	35	50	2005	4	8	10
	MEAN 30		12	8	7	1992	1	3	4
	MDN 10	0	2	0	0	1991	1	1	5
	MIN 0	0	0	0	0	1985	0	0	0
	SD 30	5	19	11	15	5	1	3	3
							6	NEVER	
12 Active component Army officers are assigned to command reserve component battalions.	MAX 100	50	75	60	50	2010	5	9	8
	MEAN 52	6	14	16	16	1993	2	4	4
	MDN 50	0	5	15	13	1991	2	4	4
	MIN 0	0	0	0	0	1984	1	0	0
	SD 32	13	20	12	15	6	2	2	3
							1	NEVER	
13 US involved in mid- to high-intensity conventional armed conflict with a major power.	MAX 100	50	50	65	35	1997	3	8	10
	MEAN 42	9	15	11	8	1990	1	3	5
	MDN 50	3	0	7	5	1989	1	3	7
	MIN 0	0	0	0	0	1984	0	0	0
	SD 33	14	16	12	9	4	1	3	3
							3	NEVER	
14 All restrictions on the assignment and utilization of women in the Army are removed.	MAX 100	10	80	50	34	1995	4	7	6
	MEAN 49	1	19	18	10	1992	1	5	4
	MDN 60	0	7	16	5	1993	1	6	4
	MIN 0	0	0	0	0	1987	0	0	0
	SD 34	3	24	15	12	3	1	2	2
							1	NEVER	
15 US involved in a low-intensity conventional armed conflict with a minor power.	MAX 100	100	40	33	50	2005	3	9	8
	MEAN 74	33	15	16	11	1988	1	4	3
	MDN 90	20	13	17	5	1986	1	3	3
	MIN 10	0	0	0	0	1984	0	0	0
	SD 34	33	13	12	14	5	1	3	2
							0	NEVER	

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9	
	Probabil- / Distribution of Pr. /		1995- /		2005- /		Year Pr. /		Overall Impact on	
	ity by /1984- 1990-		1995-		2005-		/ Goes /		OPDS' Ability to Meet	
	2025 /		2005		2025		Above 0% /		on OPDS / Army Needs (0-10)	
16 US involved in an armed conflict in which chemical weapons are exchanged.	MAX 100	25	40	50	50	2010	5	5	5	9
	MEAN 42	6	13	13	10	1997	2	3	3	5
	MDN 30	5	10	10	2	1990	1	3	3	5
	MIN 0	0	0	0	0	1984	0	0	0	0
	SD 34	7	13	13	14	7	1	2	2	3
							2	NEVER		
17 US and China sign a mutual defense treaty.	MAX 75	15	60	30	45	1997	5	5	5	3
	MEAN 54	4	19	16	15	1993	2	4	4	2
	MDN 58	0	18	14	8	1992	2	4	4	2
	MIN 20	0	0	5	3	1990	1	3	3	0
	SD 16	6	17	8	11	2	1	0	0	1
							0	NEVER		
18 US involved in an armed conflict in which biological weapons are exchanged.	MAX 59	25	25	59	45	1997	3	6	6	9
	MEAN 31	4	8	11	8	1991	1	2	2	4
	MDN 12	0	5	3	1	1990	1	3	3	5
	MIN 0	0	0	0	0	1984	0	0	0	0
	SD 32	7	9	17	12	4	1	2	2	3
							4	NEVER		
19 Reserve component Army officers are excluded from field grade positions because they are deficient in skills required to integrate high-tech weapons systems.	MAX 100	20	30	40	50	2010	3	7	7	9
	MEAN 18	3	3	7	5	1992	1	1	1	6
	MDN 0	0	0	0	0	1990	1	0	0	7
	MIN 0	0	0	0	0	1984	0	0	0	0
	SD 31	6	7	13	12	8	1	2	2	2
							9	NEVER		
20 The US is involved in an international confrontation at least as dangerous as the Cuban Missile Crisis in 1962.	MAX 100	120	100	50	50	1996	5	8	8	9
	MEAN 75	24	24	13	12	1988	1	2	2	2
	MDN 90	15	25	10	10	1988	1	2	2	2
	MIN 14	0	0	0	0	1984	0	0	0	0
	SD 29	28	27	13	13	3	2	3	3	2
							0	NEVER		

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr. /		Year Pr. /		lst /		Overall Impact on		
	ity by / 1984- 1990- 1995- 2005- /		Goes /		Impact /		OPDS' Ability to Meet		
	2025 / 1990 1995 2005 2025 /		Above 0% /		on OPDS/		Army Needs (0-10)		
21 Terrorists detonate a nuclear device in a US city.	MAX 100	10	50	74	20	2020	3	3	8
	MEAN 29	3	9	10	7	1991	1	1	3
	MDN 10	3	3	3	2	1988	0	2	2
	MIN 0	0	0	0	0	1984	0	0	0
	SD 34	3	13	17	8	9	1	1	3
							3	NEVER	

22 A nuclear weapon controlled by one of the major nuclear powers (i.e., the US, USSR, UK, France or PRC) detonates accidentally within that country's borders.	MAX 100	20	40	25	50	2000	3	3	9
	MEAN 27	4	8	7	8	1990	1	1	4
	MDN 10	1	4	3	1	1990	0	0	5
	MIN 0	0	0	0	0	1984	0	0	0
	SD 32	6	11	8	13	5	1	1	3
							5	NEVER	

23 Non-nuclear armed conflict breaks out between a major power allied to the US and some lesser nation, raising the grave danger that the conflict may escalate into World War III.	MAX 100	100	90	60	35	1993	4	9	9
	MEAN 66	22	20	14	11	1989	1	4	4
	MDN 70	15	15	10	5	1988	1	4	5
	MIN 0	0	0	0	0	1984	0	0	0
	SD 30	26	20	12	12	3	1	3	2
							1	NEVER	

24 Army officer evaluation report system changed to include input from superiors, peers and subordinates.	MAX 100	100	60	30	30	1983	3	10	9
	MEAN 50	19	13	10	5	1990	2	5	3
	MDN 50	3	10	6	0	1984	0	0	0
	MIN 0	0	0	0	0	2	1	3	2
	SD 33	33	16	11	10				
							2	NEVER	

25 A verifiable mutual freeze on nuclear weapons production and deployment is agreed upon by the US and the USSR.	MAX 100	10	70	35	40	1998	5	7	3
	MEAN 54	2	15	20	17	1993	2	4	1
	MDN 60	0	12	20	10	1995	1	4	1
	MIN 0	0	0	0	0	1989	0	3	0
	SD 29	3	19	11	17	3	1	1	1
							0	NEVER	



EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr. /		Year Pr. /		1st /		Overall Impact on		
	ity by / 1984- 1990- 1995- 2005- /		Goes /		Impact /		OPDS' Ability to Meet		
	2025 / 1990 1995 2005 2025 /		Above 0% /		on OPDS /		Army Needs (0-10)		
26 Army increases length of battalion/brigade command tours to 36 months.	90	60	30	35	40	1996	4	4	5
	MEAN	40	17	10	8	1989	1	1	3
	MDN	50	10	10	0	1988	1	1	3
	MIN	0	0	0	0	1984	0	0	2
	SD	32	15	10	12	3	1	1	2
							4	NEVER	
27 An international military force is established to guarantee world peace and enforce UN and World Court decisions.	20	40	60	20	25	2020	5	9	5
	MEAN	20	5	6	6	1997	2	4	2
	MDN	10	0	2	1	1992	2	5	2
	MIN	0	0	0	0	1984	0	0	0
	SD	24	9	14	7	11	2	3	2
							7	NEVER	
28 Army restructures to eliminate two higher echelons (i.e., division and corps) of command and control.	53	10	15	25	35	2025	3	7	9
	MEAN	13	2	5	5	1997	2	3	5
	MDN	0	0	0	0	1995	2	2	6
	MIN	0	0	0	0	1984	0	0	1
	SD	20	3	4	8	15	2	3	3
							8	NEVER	
29 Medical breakthrough in neurotransmitter research provides drugs which significantly improve the effectiveness of human memory.	100	15	30	50	70	2020	5	10	3
	MEAN	33	4	11	16	1998	3	7	1
	MDN	28	0	10	10	1995	3	7	1
	MIN	0	0	0	0	1990	0	5	0
	SD	30	4	8	13	10	2	2	1
							5	NEVER	
30 US withdraws from military and civil arms of NATO.	100	25	30	30	40	2005	2	8	8
	MEAN	26	4	19	19	1994	2	3	4
	MDN	15	0	5	3	1995	1	3	5
	MIN	0	0	0	0	1985	0	0	0
	SD	20	6	7	9	6	2	3	3
							4	NEVER	

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr. /		Year Pr. /		Impact /		Overall Impact on		
	ity by / 1984- 1990- /		1995- 2005- /		Goes /		OPDS' Ability to Meet		
	2025 / 1990 1995		2005 2025		Above 08 /		on OPDS/ Army Needs (0-10)		
31 Army implements a two officer corps system like the Navy (e.g., a line and a staff promotion system).	MAX 100 MEAN 53 MDN 60 MIN 0 SD 34	100 15 3 0 29	40 15 12 0 15	40 15 14 0 14	35 10 10 0 10	2005 1992 1991 1984 5	4 2 2 0 1	4 5 6 3 1	4 4 4 2 1
32 West Germany and East Germany are unified peacefully.	MAX 100 MEAN 25 MDN 10 MIN 0 SD 31	20 0 0 0 5	50 7 0 0 13	50 10 3 0 18	35 6 1 0 9	2020 1996 1995 1984 8	2 2 0 0 2	2 3 2 0 2	2 1 1 0 1
33 China and USSR reestablish full economic and political ties.	MAX 80 MEAN 32 MDN 30 MIN 0 SD 27	10 0 0 0 3	70 9 2 0 16	30 5 0 0 9	50 12 5 0 15	2020 1996 1993 1984 9	3 1 0 1	3 3 0 3	2 2 2 0 2
34 Techniques for imparting information from computers directly into human memory during periods of REM sleep are available commercially.	MAX 100 MEAN 38 MDN 25 MIN 0 SD 34	100 0 0 0 22	30 4 0 0 7	50 12 5 0 17	60 16 10 0 17	2020 1967 1996 1984 9	10 3 2 0 3	10 8 0 0 3	3 1 0 0 1
35 Mexico joins the communist block.	MAX 75 MEAN 26 MDN 19 MIN 0 SD 23	40 4 0 0 10	20 3 7 0 8	30 8 5 0 10	25 7 7 0 6	2015 1994 1991 1984 9	2 0 0 0 1	5 1 1 0 2	9 5 7 0 2

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probability by 1984-1990-2025 / Distribution of Pr. 2005-2025				Year Pr. Goes Above 0%		1st Impact on OPDS/ Army Needs (0-10)	Overall Impact on OPDS' Ability to Meet Army Needs (0-10)	
36 Direct commissions to major and lieutenant colonel are granted to civilian specialists in technical fields experiencing shortages of officers (i.e., non-AMEDD, JAG and Chaplain).	92	29	80	60	25	1994	2	7	7
	MAX		30	15	10	1992	1	6	3
	MEAN	65	10	28	14	1993	1	6	3
	MDN	75	0	5	5	1987	1	3	1
	MIN	20	7	19	10	2	0	1	1
	SD	23							
						0 NEVER			
37 France rejoins military arm of NATO and replaces 5th US Corps along German border (5th US Corps returns home).	80	40	40	25	35	2020	4	10	3
	MAX	26	10	5	6	1992	1	4	1
	MEAN	17	0	0	0	1990	0	4	0
	MDN	0	0	0	0	1986	0	4	0
	MIN	0	11	7	11	2	1	4	1
	SD	26							
						4 NEVER			
38 Congress mandates withdrawal of a large number of troops from foreign soil (e.g., Europe, Korea or Central America).	100	80	60	50	50	1996	4	6	10
	MAX	58	15	20	12	1991	1	2	4
	MEAN	50	10	21	5	1990	1	1	5
	MDN	0	0	0	0	1985	0	0	0
	MIN	0	19	16	15	4	1	2	3
	SD	28							
						1 NEVER			
39 Congress mandates at least two years of national service (either civilian or military) for all 18 year olds.	100	8	50	50	50	2005	4	8	3
	MAX	62	1	25	21	1994	2	6	2
	MEAN	60	0	14	20	1993	2	6	2
	MDN	15	0	0	10	1992	0	5	2
	MIN	0	3	13	11	4	1	1	3
	SD	24							
						0 NEVER			
40 Army procurement regulations are changed to reduce major equipment acquisition time.	90	40	50	30	30	1990	2	7	6
	MAX	72	18	23	14	1985	2	5	2
	MEAN	70	16	20	8	1984	2	5	2
	MDN	40	0	0	0	1988	2	5	1
	MIN	0	13	11	11	1	0	1	1
	SD	12							
						0 NEVER			

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probability by 1984-1990 / 1990-2025		Distribution of Pr. 1995-2005		Year Pr. Goes Above 08 / on OPDS / Army Needs (0-10)		1st Impact / OPDS' Ability to Meet		Overall Impact on
41 At least 70% of all US college students are required to use personal computers as part of their college training.	MAX 100 MEAN 80 MDN 90 MIN 0 SD 26	100 10 0 34	70 23 20 0 10	50 18 20 0 15	50 15 0 0 18	1995 1989 1989 1984 3	8 3 3 0 2	10 6 7 0 3	1 1 0 0 2
42 Army implements a unit performance incentive plan.	MAX 99 MEAN 47 MDN 50 MIN 0 SD 33	50 7 0 0 13	70 16 10 0 18	60 18 10 0 15	30 9 0 0 10	2000 1992 1991 1985 4	3 2 0 0 1	10 4 0 0 3	8 3 2 0 3
43 Congress approves merit pay system for Army officers (as opposed to the current system of "grade" and "time in service").	MAX 98 MEAN 33 MDN 15 MIN 0 SD 36	50 5 0 0 12	25 6 0 0 8	70 13 2 0 21	70 9 0 0 17	2000 1992 1991 1985 5	5 2 2 0 1	10 5 6 0 4	8 2 0 0 3
44 Congress adopts a vested retirement system (e.g., soldiers can leave the service early and receive reduced retirement pay).	MAX 99 MEAN 51 MDN 60 MIN 5 SD 31	5 1 0 0 2	60 14 10 0 17	35 15 14 0 12	45 21 20 0 15	2010 1993 1992 1988 6	4 2 2 0 1	6 4 4 2 1	4 3 3 1 1
45 A major depression occurs in the US (e.g., the national unemployment rate exceeds 15 percent for at least four consecutive years).	MAX 100 MEAN 29 MDN 15 MIN 0 SD 32	75 8 0 0 22	25 6 2 0 8	25 7 4 0 8	40 8 2 0 11	2010 1994 1991 1986 7	3 1 1 0 1	9 4 4 0 3	8 3 2 0 3

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probability by / 1984-2025 / 1990-2025		Distribution of Pr. 1995-2005 / 2005-2025		Year Pr. / Goes Above on /		1st Impact / on OPDS / Army Needs (0-10)		Overall Impact on OPDS' Ability to Meet
46 Army fields first ground-to-ground and ground-to-air weapon firing systems controlled by neurooptics (i.e., eyeball controlled).	MAX 100	100	50	50	60	2020	3	9	6
	MEAN 53	11	7	18	17	1995	1	4	2
	MDN 50	0	2	8	11	1994	2	3	2
	MIN 0	0	0	0	0	1984	0	0	0
	SD 37	26	12	21	17	9	1	3	2
							3 NEVER		
47 Congress institutes a draft for reserve components.	MAX 100	50	50	70	25	1996	11	10	8
	MEAN 46	9	16	13	6	1990	3	6	2
	MDN 50	0	10	8	0	1990	2	6	1
	MIN 0	0	0	0	0	1984	0	0	0
	SD 36	15	17	19	9	3	3	3	2
							4 NEVER		
48 Congress institutes a draft for active component.	MAX 100	50	100	50	35	1999	7	9	7
	MEAN 52	6	18	17	11	1992	2	5	3
	MDN 60	0	10	13	3	1991	1	5	3
	MIN 0	0	0	0	0	1986	0	0	0
	SD 36	14	23	18	13	3	2	3	3
							3 NEVER		
49 President directs Army troops to patrol border between US and Mexico.	MAX 50	5	25	25	25	2000	4	3	6
	MEAN 21	1	6	8	6	1994	2	3	4
	MDN 20	0	2	5	5	1992	2	3	4
	MIN 0	0	0	0	0	1992	1	2	4
	SD 14	2	7	7	7	2	1	0	1
							1 NEVER		
50 Reserve components comprise total US commitment to NATO.	MAX 60	20	40	40	40	1996	11	9	10
	MEAN 21	2	6	8	6	1991	2	3	6
	MDN 0	0	0	0	0	1990	1	3	8
	MIN 0	0	0	0	0	1987	0	0	0
	SD 29	5	11	13	11	3	3	2	3
							11 NEVER		

EVENTS - ORDERED BY EVENT NUMBER

EVENT	Probability / Distribution of Pr. / Year Pr. / 1st / Overall Impact on										
	1	2	3	4	5	6	7	8	9		
	by / 1984-1990-2005- / Above or / on OPDS / Army Needs (0-10)										
	1990	1995	2005	2025	2005	2025	2010	1999	1997	1995	
51 US military services are combined into one uniformed service (e.g., Canadian military system).	27	6	5	10	10	4	4	9	4	8	
	MAX	5	1	3	3	1	1	4	5	5	
	MEAN	3	0	1	1	0	0	0	0	0	
	MDN	0	0	0	0	0	0	0	0	0	
	MIN	0	0	0	0	0	0	0	0	0	
	SD	9	2	2	4	4	5	3	3	2	
							4	NEVER			
52 US media mounts extensive anti-military campaign.	100	120	45	43	50	2025	4	5	1	9	
	MAX	65	14	12	10	1986	1	1	1	5	
	MEAN	70	10	11	10	1987	1	0	0	6	
	MDN	0	0	0	0	1984	0	0	0	0	
	MIN	0	0	15	15	9	1	2	3	3	
	SD	32	34				1	NEVER			
53 South Africa invaded by a neighbor; US joins in defense.	80	190	70	60	25	2000	7	5	2	9	
	MAX	27	2	11	10	1990	2	2	2	3	
	MEAN	20	0	6	10	1990	1	2	2	6	
	MDN	0	0	0	0	1985	0	0	0	0	
	MIN	0	0	17	11	4	2	2	2	3	
	SD	27	3				5	NEVER			
54 Military scholarships provide virtually all federally funded money for college education.	100	10	20	50	30	2000	10	8	3	8	
	MAX	18	5	7	4	1990	3	3	3	4	
	MEAN	10	2	2	0	1985	1	3	3	3	
	MDN	0	0	0	0	4	0	0	0	0	
	MIN	0	0	4	12		3	3	3	3	
	SD	27	3				8	NEVER			
55 Large private corporations establish lucrative college student financial aid packages with follow-on employment obligations.	100	50	80	60	60	1995	5	8	2	10	
	MAX	66	17	23	18	1988	2	2	1	3	
	MEAN	80	10	20	15	1989	2	1	1	3	
	MDN	0	0	0	0	1984	0	0	0	0	
	MIN	0	0	1	16	3	2	2	2	3	
	SD	32	19	18	14		0	NEVER			

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr.		Year Pr. /		1st		Overall Impact on		
	ity by / 1984- 1990- 2005-		Above or /		Impact /		OPDS' Ability to Meet		
	2025 /	1990	1995	2005	2025	1990	1995	2005	1990
56 Congress reduces military retirement pay by amount of social security benefits when individual becomes eligible for social security.	MAX 100 MEAN 100 MDN 100 MIN 100 SD 0	0 0 0 0 0	15 15 15 15 0	35 35 35 35 0	50 50 50 50 0	1990 1990 1990 1990 0	0 0 0 40 0	0 0 0 0 0	0 0 0 0 0
57 At least 75% of all major universities offer a full range of graduate degree programs via national educational computer network.	MAX 100 MEAN 44 MDN 50 MIN 0 SD 31	30 2 0 0 7	60 9 2 0 15	60 14 10 0 12	50 19 14 0 18	2005 1995 1995 1989 4	12 2 0 0 3	9 5 0 0 2	7 2 2 0 2
58 US Army moves to protect a foreign nation which is a supplier of strategic resources to US or its allies.	MAX 100 MEAN 73 MDN 73 MIN 35 SD 25	25 9 5 0 8	90 23 15 5 23	25 18 20 5 6	65 23 23 0 18	1994 1987 1987 1984 3	9 3 2 0 3	8 4 3 0 2	5 3 3 0 2
59 A commercially viable technology is demonstrated that permits the emergence of a "hydrogen economy" and a major reduction in dependence on fossil fuels.	MAX 100 MEAN 50 MDN 50 MIN 0 SD 36	60 6 0 0 14	50 8 5 0 12	60 14 13 0 13	22 20 0 25	2025 1993 1985 10	19 1 0 3	8 4 0 3	19 2 0 3
60 An anti-technology movement more intense than any known to date emerges throughout the US to block certain lines of physical and biological research and halts further automation of work.	MAX 75 MEAN 17 MDN 10 MIN 0 SD 23	10 1 0 0 2	25 3 0 0 5	30 0 0 0 9	30 6 0 0 9	1995 1992 1992 1985 7	3 2 0 0 2	3 1 0 0 1	10 8 2 2 2

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr.		Year Pr. /		Impact /		Overall Impact on		
	ity by / 1984- 1990- 1995- 2005-		Goes /		Above o /		On OPDS/ Army Needs (0-10)		
	1990	1995	2005	2025	2010	1996	1995	1990	
61 A free-access national educational computer network is established by the federal government.	MAX 100 MEAN 25 MDN 5 MIN 0 SD 33	30 2 0 0 7	50 11 0 0 19	30 5 1 0 9	2010 1996 1995 1990 6	10 2 1 0 3	10 5 6 0 4	10 3 5 0 4	3 1 0 0 1
62 Commercially available biological technologies are developed that facilitate rapid learning.	MAX 80 MEAN 32 MDN 30 MIN 0 SD 20	10 2 0 0 4	35 10 9 0 9	40 14 10 0 12	2015 1996 1997 1992 6	10 5 5 1 2	10 5 6 6 0	7 6 6 6 0	3 2 2 1 0
63 Generic engineering break-through provides an abundant, inexpensive food source.	MAX 100 MEAN 66 MDN 20 MIN 25 SD 25	50 11 2 0 17	50 16 10 0 14	50 18 18 0 12	2010 1994 1996 1985 6	10 5 4 2 2	5 3 3 0 2	8 3 3 0 2	2 1 2 0 1
64 US declares itself bilingual.	MAX 80 MEAN 24 MDN 15 MIN 0 SD 25	0 0 0 0 0	5 1 0 0 2	15 4 3 0 5	80 20 13 0 23	2020 2002 2000 1994 8	2 1 1 0 1	3 2 2 0 1	9 6 7 3 2
65 Army fields computerized decision support system which is available to all commanders at company level and above.	MAX 100 MEAN 67 MDN 75 MIN 0 SD 32	40 7 0 0 13	90 21 12 0 24	70 24 20 0 21	50 15 15 0 15	1998 1992 1990 1986 4	5 2 0 0 4	10 6 6 3 3	7 2 2 0 2



EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9	
	Probabil- / Distribution of Pr. / Overall Impact on		Year Pr. / Ist / Impact / OPDS' Ability to Meet		Year Pr. / Ist / Impact / OPDS' Ability to Meet		Year Pr. / Ist / Impact / OPDS' Ability to Meet		Year Pr. / Ist / Impact / OPDS' Ability to Meet	
	ity by / 1984- 1990- 2005- / Goes / Above 08 / on OPDS/ Army Needs (0-10)		ity by / 1984- 1990- 2005- / Goes / Above 08 / on OPDS/ Army Needs (0-10)		ity by / 1984- 1990- 2005- / Goes / Above 08 / on OPDS/ Army Needs (0-10)		ity by / 1984- 1990- 2005- / Goes / Above 08 / on OPDS/ Army Needs (0-10)		ity by / 1984- 1990- 2005- / Goes / Above 08 / on OPDS/ Army Needs (0-10)	
	2025 / 1990	1995	2005	2005	2025	2025	2025	2025	2025	2025
66 Army assigned mission of security of major public utilities, facilities and other essential services.	40	15	15	15	30	2020	5	4	6	
	MEAN	15	2	4	9	2002	3	2	3	
	MDN	10	0	3	5	1999	2	2	4	
	MIN	0	0	0	0	1991	1	0	0	
	SD	13	5	5	10	10	2	1	2	
										2 NEVER
67 Scientists improve all communications systems so that they are invulnerable to electromagnetic pulse from nuclear detonations or electronic countermeasures.	100	20	70	50	40	2010	5	8	5	
	MEAN	40	10	14	13	1995	2	5	1	
	MDN	35	0	10	15	1995	2	5	1	
	MIN	0	0	0	0	1985	0	0	0	
	SD	30	18	12	11	7	2	2	2	
										2 NEVER
68 A general staff is created patterned after the German General Staff.	17	1	3	5	8	1989	0	5	3	
	MEAN	17	3	5	8	1989	0	5	3	
	MDN	17	1	3	8	1989	0	5	3	
	MIN	17	1	3	8	1989	0	5	3	
	SD	0	0	0	0	0	0	0	0	
										0 NEVER
69 Army fields man-portable, "smart" maps able to determine convoy routes, terrain features, etc., displays them graphically on a small computer system.	100	100	50	50	55	2005	2	10	3	
	MEAN	79	17	28	22	1991	2	10	1	
	MDN	85	18	23	25	1990	2	7	1	
	MIN	10	0	0	0	1984	0	1	0	
	SD	23	13	16	18	5	2	3	1	
										0 NEVER
70 Army fields staff-oriented, electronic wargames for training.	100	120	65	60	50	1996	3	10	4	
	MEAN	88	25	28	13	1988	2	10	1	
	MDN	94	25	24	0	1989	2	7	0	
	MIN	35	0	0	0	1984	0	1	0	
	SD	17	17	13	18	3	1	3	1	
										0 NEVER

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr. / Overall Impact on								
	ity by / 1984- 1990- 1995- 2005- / Goes / Impact / OPDS' Ability to Meet								
	2025 / 1990 1995 2005 / Above o% / on OPDS/ Army Needs (0-10)								
71 The Japanese succeed in developing the world's first 5th generation computer.	MAX 21	5	5	5	6	1988	3	7	2
	MEAN 21	5	5	5	6	1988	3	7	2
	MDN 21	5	5	5	6	1988	3	7	2
	MIN 21	5	5	5	6	1988	3	7	2
	SD 0	0	0	0	0	0	0	0	0
						0	NEVER		
72 China invades Taiwan.	MAX 50	10	12	30	25	2002	5	5	5
	MEAN 16	2	2	7	6	1993	2	2	2
	MDN 10	0	0	5	5	1994	0	1	1
	MIN 0	0	0	0	0	1985	0	0	0
	SD 17	3	3	9	8	5	2	2	2
						5	NEVER		
73 Army fields hand-held electronic technical manuals.	MAX 100	100	60	50	60	2005	5	10	5
	MEAN 74	21	18	18	18	1992	2	5	1
	MDN 90	3	15	19	13	1990	1	5	0
	MIN 0	0	0	0	0	1984	0	0	0
	SD 32	31	17	16	20	5	2	3	2
						1	NEVER		
74 All military space responsibilities are consolidated into a 4th defense department (i.e., US Space Force).	MAX 65	0	5	24	36	1990	0	2	7
	MEAN 65	0	5	24	36	1990	0	2	7
	MDN 65	0	5	24	36	1990	0	2	7
	MIN 0	0	0	0	0	0	0	2	7
	SD 0	0	0	0	0	0	0	0	0
						0	NEVER		
75 A country led by an irrational head of state acquires an operational nuclear capability.	MAX 100	100	70	50	50	2005	5	3	9
	MEAN 82	27	25	20	10	1990	1	1	3
	MDN 100	16	23	20	2	1989	0	0	0
	MIN 10	0	0	0	0	1984	0	0	0
	SD 31	29	19	17	15	5	2	1	3
						0	NEVER		

EVENTS - ORDERED BY EVENT NUMBER

EVENT	1	2	3	4	5	6	7	8	9
	Probabil- / Distribution of Pr. /		1995- / 2005-		Year Pr. /		Impact /		Overall Impact on
	ity by / 1984- 1990- / 1990 1995 / 2005 2025 /		1995 2005 /		Above o& /		on OPDS /		OPDS' Ability to Meet Army Needs (0-10)
76 The number of nations known to possess nuclear weapons reaches 10.	85	20	50	10	5	1990	1	3	1
	MEAN	20	50	10	5	1990	1	3	1
	MDN	20	50	10	5	1990	1	3	1
	MIN	20	50	10	5	1990	1	3	1
	SD	0	0	0	0	0	0	0	0
						0	0	0	0
						0	0	0	0
77 Army ROTC programs are dropped by approximately 50% of participating universities.	80	9	45	60	35	2000	5	5	9
	MEAN	1	8	10	5	1993	2	1	7
	MDN	0	0	0	0	1992	1	0	7
	MIN	0	0	0	0	1987	0	0	5
	SD	26	3	11	15	4	2	2	1
						3	NEVER		
78 Public school systems adopt new learning techniques which virtually eliminate all intellectual deficiencies caused by early-childhood cultural deprivation.	100	10	20	50	75	2020	10	10	5
	MEAN	1	3	8	10	1998	3	5	2
	MDN	0	0	3	0	1996	2	5	0
	MIN	0	0	0	0	1990	0	0	0
	SD	30	3	5	13	8	3	3	2
						8	NEVER		
79 Massive demonstrations for arms control and arms reduction occur throughout the western world.	60	20	20	10	10	1988	1	1	8
	MEAN	20	20	10	10	1988	1	1	8
	MDN	20	20	10	10	1988	1	1	3
	MIN	20	20	10	10	1988	1	1	8
	SD	0	0	0	0	0	0	0	0
						0	0	0	0
						0	0	0	0
80 An all-out bacteriological attack kills a significant portion of US population.	99	40	5	50	20	2025	1	1	10
	MEAN	11	1	4	4	2002	0	0	4
	MDN	3	0	0	0	1995	0	0	3
	MIN	0	0	0	0	1984	0	0	3
	SD	23	9	1	11	15	0	0	4
						7	NEVER		

EVENTS - ORDERED BY EVENT NUMBER

1	2	3	4	5	6	7	8	9
Probabil- ity by /1984- 2025 / 1990 1995	Distribution of Pr. 1995- 2005	2005- 2025	Year Pr. / Goes / Above 0%	1st / Impact / on OPDS/	Overall Impact on OPDS' Ability to Meet Army Needs (0-10)			
90	10	40	50	60	2005	5	10	5
30	2	7	12	9	1995	3	7	2
20	0	7	10	0	1994	3	7	1
3	0	0	0	0	1985	0	1	0
29	4	11	15	15	5	2	3	2

#1 Federal government starts system of free universities; provides college education exchanged for federal work which can be fulfilled by military service.

5 NEVER

NOMINAL TREND FORECASTS TAKEN FROM ALL ROUNDS OF PDOS DELPHI. THIS DATA WAS ENTERED INTO THE INTERAX DATA BASE FOR THE INITIAL WORK WITH THE MODEL. THIS DATA IS NOT IN THE FINAL PDOS INTERAX MODEL.

TRENDS - ORDERED BY TREND NUMBER

TREND	1	2	3	4	5	2025	Consequences for PDOS if this forecast actually materializes (0-10)		
							POS	NEG	
1 Competition between the Army, the private sector and other services for high-skill, high-aptitude personnel.	1975	1984	1990	1995	2005	2025	POS	NEG	
	MAX	100	400	500	500	300	5	10	
	MEAN	100	146	176	176	186	5	5	
	MDN	80	120	130	140	140	3	7	
	MIN	30	110	110	100	100	2	2	
SD	30	0	56	96	97	66	2	2	
2 Percentage of Army officer positions requiring computer literacy.	1975	1984	1990	1995	2005	2025	POS	NEG	
	MAX	100	500	1000	1000	5000	10	7	
	MEAN	30	262	486	486	1155	6	3	
	MDN	30	200	400	600	600	5	3	
	MIN	5	120	150	150	200	225	1	0
SD	20	0	148	327	1283	3669	3	2	
3 Percentage of Army officers who are computer literate.	1975	1984	1990	1995	2005	2025	POS	NEG	
	MAX	100	1000	1000	1000	5000	10	3	
	MEAN	21	292	509	509	1134	7	2	
	MDN	20	200	400	400	600	1500	7	2
	MIN	4	115	140	140	100	250	1	0
SD	17	0	221	314	1224	3505	2	1	
4 Percentage of Women in the US Army.	1975	1984	1990	1995	2005	2025	POS	NEG	
	MAX	100	200	400	400	400	10	9	
	MEAN	45	123	150	150	159	5	4	
	MDN	50	110	115	115	135	150	5	3
	MIN	6	80	80	80	50	50	0	0
SD	24	0	32	76	76	104	3	2	
5 Use of computers and satellites to deliver knowledge-based material, tests and "cook book" solutions to individual Army officers throughout the world in peace or war.	1975	1984	1990	1995	2005	2025	POS	NEG	
	MAX	100	300	500	500	2000	5000	10	7
	MEAN	41	136	184	184	359	744	6	4
	MDN	25	120	150	150	175	200	6	4
	MIN	0	100	100	100	100	105	1	0
SD	36	48	48	104	453	1323	2	2	

TRENDS - ORDERED BY TREND NUMBER

Consequences for OPDS if this forecast actually materializes (0-10)

TREND

	1	2	3	4	5	6	7
	1975	1984	1990	1995	2005	2025	POS NEG
6 Requirements for Army officers with engineering and technical skills.	98 62 73 3 25	100 100 100 100 C	200 129 125 100 24	300 154 140 100 46	500 191 175 100 46	500 224 200 100 11?	9 4 5 1 2
7 Percentage of all Army officers who are deficient in basic educational skills.	150 101 100 10 30	100 100 100 100 0	115 96 98 90 8	120 89 90 40 17	125 81 85 10 26	115 73 80 10 3	10 4 4 0 3
8 Percentage of all Army officers for whom English is a second language.	110 52 50 1 41	100 100 100 100 0	175 109 110 11 29	250 131 120 100 37	225 137 130 100 32	300 147 136 100 49	6 5 3 0 3
9 Desire of politicians to take detailed control of tactical Army combat operations.	150 107 100 60 21	100 100 100 100 0	120 102 100 80 10	150 103 100 70 17	140 99 100 50 21	200 105 100 25 36	7 2 3 0 2
10 Influence of world peace movement organizations on US policies.	500 152 120 50 96	100 100 100 100 0	190 103 120 50 26	150 106 103 50 22	130 99 100 50 20	150 99 100 50 24	7 2 1 0 2

TEMPS - ORDERED BY TRFND NUMBER

Consequences for CPDS if this forecast actually materializes (0-10)

TREND

1 2 3 4 5 6

1975 1984 1990 1995 2006 2025 POS NEG

MAX  
MEAN  
MDN  
MIN  
SD

150 100 200 500 500 500  
88 100 102 118 124 133  
80 100 90 90 90 100  
50 100 90 60 65 80  
25 0 78 104 103 100

11 Retention of Army personnel capable of maintaining high-tech equipment.

11-5-A-20

MAX  
MEAN  
MDN  
MIN  
SD

150 100 120 140 160 200  
75 100 96 96 104 122  
80 100 100 100 100 110  
20 100 50 25 50 70  
29 0 16 26 31 38

12 Retention of Army personnel capable of operating high-tech equipment.

MAX  
MEAN  
MDN  
MIN  
SD

115 100 150 175 195 200  
73 100 99 99 107 119  
80 100 100 94 93 100  
10 100 40 25 50 80  
28 0 23 33 35 38

13 Accession and retention of Army instructors/mentors capable of training Army officers to use and maintain high-tech equipment.

MAX  
MEAN  
MDN  
MIN  
SD

130 100 220 400 500 700  
74 100 134 173 211 269  
80 100 120 150 185 200  
33 100 90 85 80 80  
24 0 73 82 117 177

14 Cost of Army officer training and education system in constant dollars.

MAX  
MEAN  
MDN  
MIN  
SD

200 100 150 200 200 200  
115 100 94 96 93 90  
110 100 95 90 80 80  
60 100 50 50 50 20  
36 0 18 30 44 52

15 Capability of US industrial base to support prolonged combat operations.

5 10 5 7 0 0 2 3

TRENDS - ORDERED BY TREND NUMBER

Consequences for OPDS if this forecast actually materializes (0-10)

TREND

	1	2	3	4	5	6	Consequences for OPDS if this forecast actually materializes (0-10)
	1975	1984	1990	1995	2005	2025	POS NEG
1. Conventional Army force capabilities.	MAX 100 MEAN 73 MDN 80 MIN 50 SD 14	100 100 100 100 0	200 122 120 90 24	250 136 125 75 41	300 150 140 100 48	400 174 150 100 66	10 9 4 5 3 0 0 3
17. Extent to which senior Army commanders understand, use and integrate the full capabilities of high-tech systems.	MAX 105 MEAN 66 MDN 80 MIN 10 SD 29	100 100 100 100 0	140 111 110 90 11	200 130 125 80 28	250 157 150 75 47	500 226 200 50 121	10 10 3 7 0 0 3
13. Army use of computers to deliver instruction tailored to individual Army officer needs.	MAX 90 MEAN 39 MDN 33 MIN 0 SD 30	100 100 100 100 0	200 133 125 100 32	400 184 150 100 91	1000 283 200 100 236	1000 378 300 100 293	5 7 2 3 0 0 2
19. US technological lead relative to potential adversaries.	MAX 300 MEAN 132 MDN 120 MIN 80 SD 51	100 100 100 100 0	110 98 100 80 8	130 98 98 75 16	150 95 95 20 28	200 103 97 0 48	10 10 3 2 0 0 3
2. Amount of Army officer retraining required due to skill obsolescence.	MAX 95 MEAN 71 MDN 80 MIN 10 SD 25	100 100 100 100 0	200 140 125 100 34	400 179 150 105 75	500 233 190 110 112	900 293 200 125 203	8 4 4 3 2 0 2



TRENDS - ORDERED BY TREND NUMBER

TREND	1	2	3	4	5	6	CONSEQUENCES FOR OPDS IF THIS FORE- CAST ACTUALLY MATERIALIZES (0-10)	
	1975	1984	1990	1995	2005	2025	TOS NEG	
21 Use of high quality, realistic simulations for Army officer training.	90 63 70 10 18	100 100 100 100 0	200 154 150 115 72	500 227 200 130 98	700 372 370 140 154	10000 1174 400 200 2400	9 7 7 5 1	3 2 2 0 1
	MAX MEAN MDN MIN SD							
22 Aptitude of high school graduates to learn high-tech skills.	110 87 90 40 17	100 100 100 100 0	200 114 105 95 24	300 132 120 95 46	400 155 140 95 69	500 194 150 100 115	10 6 7 0 2	8 2 1 0 2
	MAX MEAN MDN MIN SD							
23 Percentage of Americans aged 22-30 years with strong spiritual beliefs.	150 92 95 30 25	100 100 100 100 0	150 175 100 95 12	150 108 105 90 13	135 107 105 95 11	130 105 100 90 11	7 3 3 0 2	7 2 1 0 2
	MAX MEAN MDN MIN SD							
24 Compatibility of value set of high school graduates with Army values.	90 69 75 20 19	100 100 100 100 0	150 112 110 95 15	150 112 110 90 16	200 113 100 85 26	200 114 101 75 22	10 3 3 0 3	10 2 2 0 2
	MAX MEAN MDN MIN SD							
25 Compatibility of value set of college graduates aged 22-30 years with Army values.	90 62 55 20 24	100 100 100 100 0	120 102 100 80 10	150 104 100 75 17	150 105 100 70 19	200 108 100 50 31	10 4 3 0 3	10 2 0 0 2
	MAX MEAN MDN MIN SD							

TRENDS - ORDERED BY TREND NUMBER

Consequences for OPDS if this forecast actually materializes (0-10)

TREND

	1	2	3	4	5	6	2025	POS	NEG
26 Congressional control of defense policy.	1975	1984	1990	1995	2005	2025			
MAX	200	100	150	200	200	250	8		
MEAN	101	100	112	114	120	130	3		
MDN	90	100	110	110	105	110	3		
MIN	70	100	90	80	80	80	0		
SD	28	0	19	27	35	44	3		
27 Size of gap between Army and civilian living standards.									
MAX	500	100	115	150	500	150	10	8	
MEAN	126	100	102	102	121	94	3	3	
MDN	100	100	100	100	100	100	0	0	
MIN	40	100	90	70	50	25	0	0	
SD	102	0	7	16	94	26	3	3	
28 Time available for the mobilization and deployment of the reserve component to reinforce active component units wngaged in combat.									
MAX	500	100	110	115	120	125	7	10	
MEAN	144	100	98	78	68	64	2	6	
MDN	120	100	90	80	70	60	2	7	
MIN	50	100	50	20	10	5	0	0	
SD	98	0	16	25	32	38	3	2	
29 Incidents of Army forces involved in joint/combined operations.									
MAX	90	100	270	1000	2000	3000	10	7	
MEAN	39	100	131	197	278	364	5	3	
MDN	30	100	120	145	163	195	6	3	
MIN	10	100	100	80	90	50	0	0	
SD	26	0	29	198	424	650	3	2	
30 Ability of commanders to effectively use the increasing volume of information available for command and control decisions.									
MAX	120	100	150	200	400	500	0	9	
MEAN	87	100	115	145	210	296	6	3	
MDN	90	100	110	150	200	275	6	3	
MIN	50	100	90	50	105	60	2	0	
SD	18	0	22	41	76	147	2	2	

TRENDS - ORDERED BY TREND NUMBER

TREND	1	2	3	4	5	6	Consequences for OPDS if this fore- cast actually materializes (0-10)
	1975	1984	1990	1995	2005	2025	POS NEG
31 Amount of time available for Army command and control decisions.	200 129 115 70 41	100 100 100 100 0	105 95 90 50 14	110 72 75 25 27	115 63 60 10 28	120 55 50 5 30	10 4 3 0 3
	MAX MEAN MDN MIN SD						
32 Adequacy of training of Army field commanders for continuous operations in an electronic warfare environment.	110 62 70 10 31	100 100 100 100 0	150 114 110 90 16	250 137 118 85 45	500 167 175 90 98	500 201 145 80 122	9 4 3 0 3
	MAX MEAN MDN MIN SD						
33 Capability of Army commanders and their staffs to operate effectively for sustained periods in mid- and high-intensity combat.	200 97 100 50 32	100 100 100 100 0	150 106 100 90 18	200 118 110 80 32	225 129 125 70 38	240 143 130 80 48	7 4 5 0 3
	MAX MEAN MDN MIN SD						
34 Cost to the Army of permanent change of station (PCS) relocation in constant dollars.	200 89 90 50 33	100 100 100 100 0	200 119 110 90 26	300 134 120 50 52	400 166 150 50 81	800 218 185 50 178	8 2 1 0 3
	MAX MEAN MDN MIN SD						
35 Quality of American public school system.	130 99 98 80 13	100 100 100 100 0	110 105 110 90 6	130 113 110 90 9	150 123 120 85 17	200 133 130 85 26	5 2 3 0 2
	MAX MEAN MDN MIN SD						

TRENDS - ORDERED BY TREND NUMBER

Consequences for OPDS if this forecast actually materializes (0-10)

TREND	1	2	3	4	5	6	POS	NEG
	1975	1984	1990	1995	2005	2025		
36 Quality of American higher education system.	MAX	120	110	120	150	200	7	7
	MEAN	99	100	104	113	125	4	4
	MDN	99	100	110	110	120	5	2
	MIN	85	100	90	80	85	0	0
	SD	9	0	7	11	14	2	2
37 Percentage of Army equipment that is more expeditiously maintained in the field (e.g., modularized).	MAX	150	100	175	250	500	10	8
	MEAN	68	100	118	141	182	6	4
	MDN	78	100	110	130	200	5	3
	MIN	10	100	95	90	85	2	0
	SD	36	0	20	41	93	2	2
38 Computer literacy of college graduates aged 22-30 years.	MAX	95	100	400	500	800	10	4
	MEAN	56	100	147	201	261	7	1
	MDN	63	100	120	150	200	7	1
	MIN	10	100	105	110	120	2	0
	SD	31	0	66	152	146	2	1
39 Percentage of Army officers with actual experience.	MAX	300	100	200	400	600	7	9
	MEAN	138	100	84	95	99	2	5
	MDN	125	100	90	80	80	3	6
	MIN	30	100	10	0	0	0	0
	SD	56	0	16	83	128	2	2
40 Reliability of high-tech Army equipment for sustained combat operations.	MAX	120	100	200	400	500	10	8
	MEAN	69	100	111	127	166	5	4
	MDN	80	100	113	110	145	5	5
	MIN	0	100	90	80	70	0	0
	SD	34	0	25	69	72	3	1

TRENDS - ORDERED BY TREND NUMBER

Consequences for  
OPDS if this fore-  
cast actually  
materializes (0-10)

TREND

1 2 3 4 5 6

1975 1984 1990 1995 2005 2025 POS NEG

MAX  
MEAN  
MDN  
MIN  
SD

41 Vulnerability of Army communication systems on the battlefield.

500 100 150 500 500 500  
116 100 170 114 138 138  
100 100 100 95 120 120  
30 100 75 50 25 25  
100 0 17 95 99 113

7 10  
2 6  
0 5  
0 0  
3 7

MAX  
MEAN  
MDN  
MIN  
SD

42 Ability of Army personnel to use alternative approaches if high-tech equipment fails (i.e., electronic communications versus messenger; fire planning by computer versus "stubby pencil").

300 100 110 140 160 200  
130 100 91 85 79 79  
120 100 90 80 80 70  
80 100 50 30 5 5  
51 0 16 25 38 54

8 9  
2 5  
1 6  
0 0  
3 7

MAX  
MEAN  
MDN  
MIN  
SD

43 Impact of increased complexity of Army unit organizational structure on command and control practices.

100 100 125 150 200 500  
88 100 106 113 174 156  
90 100 110 110 120 123  
70 100 75 75 60 60  
10 0 11 19 70 102

8 9  
2 5  
1 6  
0 0  
3 7

MAX  
MEAN  
MDN  
MIN  
SD

44 Percentage of Army officers with access to terminals at home which are capable of supporting computer assisted instruction by telecommunications.

90 100 200 500 3000 10000  
20 100 136 211 551 1173  
10 100 120 200 300 400  
0 100 100 90 100 100  
25 0 31 98 721 2468

10 3  
7 2  
7 2  
3 0  
2 1

MAX  
MEAN  
MDN  
MIN  
SD

45 Percentage of Army officers with access to PCs/terminals at work which are capable of supporting computer assisted instruction by telecommunications.

95 100 370 1000 5000 10000  
30 100 160 290 628 1069  
10 100 150 170 250 300  
0 100 102 104 106 102  
33 0 54 266 1116 2269

10 8  
7 2  
7 2  
5 0  
2 7

TRENDS - ORDERED BY TREND NUMBER

Consequences for  
DPDS if this fore-  
cast actually  
materializes (0-10)

TREND	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
	1975	1984	1990	1995	2005	2025	POS	NEG																																										
46 Rate of modernization of Army equipment (including weapons).	75	100	180	400	900	1500	8	9																																										
	66	100	126	151	209	277	6	4																																										
	70	100	120	140	155	188	6	4																																										
	50	100	90	80	80	100	5	1																																										
	8	0	23	76	202	345	1	2																																										
	MAX	100	500	500	2000	4000	5	10																																										
	MEAN	100	149	173	295	475	2	6																																										
	MDN	85	120	150	140	140	2	7																																										
	MIN	50	80	90	80	70	0	0																																										
	SD	25	106	108	496	1025	2	3																																										
47 Size of gap between capabilities of part-time Army field grade officers and the requirements of the positions they would fill in wartime.	100	100	300	350	500	1000	10	7																																										
	76	100	129	156	194	278	5	3																																										
	80	100	110	140	180	200	5	3																																										
	20	100	100	100	100	90	0	0																																										
	21	0	47	65	106	223	3	2																																										
	MAX	100	300	350	500	1000	10	7																																										
	MEAN	100	176	156	194	278	5	3																																										
	MDN	80	110	140	180	200	5	3																																										
	MIN	20	100	100	100	90	0	0																																										
	SD	21	47	65	106	223	3	2																																										
48 Ability of the Army to conduct highly mobile, tactical combat operations.	200	100	150	170	120	150	10	10																																										
	115	100	101	93	79	73	5	5																																										
	100	100	100	90	80	70	5	5																																										
	80	100	75	50	40	10	0	1																																										
	37	0	16	26	22	38	3	3																																										
	MAX	200	150	170	120	150	10	10																																										
	MEAN	115	101	93	79	73	5	5																																										
	MDN	100	100	90	80	70	5	5																																										
	MIN	80	100	75	50	10	0	1																																										
	SD	37	0	16	26	38	3	3																																										
49 Degree of centralization of Army decision making on the battlefield.	200	100	200	220	300	600	2	9																																										
	87	100	116	117	122	139	3	5																																										
	85	100	103	110	104	110	3	5																																										
	33	100	90	80	80	60	0	1																																										
	36	0	31	32	51	114	2	2																																										
	MAX	200	200	220	300	600	2	9																																										
	MEAN	87	116	117	122	139	3	5																																										
	MDN	85	103	110	104	110	3	5																																										
	MIN	33	100	90	80	60	0	1																																										
	SD	36	0	31	51	114	2	2																																										
50 Size of the Army budget in constant dollars.	200	100	200	220	300	600	2	9																																										
	87	100	116	117	122	139	3	5																																										
	85	100	103	110	104	110	3	5																																										
	33	100	90	80	80	60	0	1																																										
	36	0	31	32	51	114	2	2																																										

TRENDS - ORDERED BY TREND NUMBER

Consequences for CPDS if this forecast actually materializes (0-10)

TREND	1975	1984	1990	1995	2005	2025	POS	NEG
51 Aptitude of college graduates to learn high-tech skills.	100 83 90 9 24	100 100 100 100 0	150 110 105 100 10	200 125 120 100 25	250 148 140 100 40	300 178 175 100 58	7 5 6 0 2	3 2 0 0 1
52 Use of "expert systems" in the conduct of military decision making.	95 52 50 0 34	100 100 100 100 0	200 127 120 103 26	400 164 145 108 76	500 214 200 120 112	10000 1082 300 7 2692	8 7 7 2 2	6 3 3 0 2
53 Army's ability to continue combat operations on a contaminated battlefield.	115 70 50 17	100 100 100 100 0	175 113 110 85 19	200 123 120 65 27	250 148 150 70 37	300 178 178 95 44	7 4 4 0 2	7 3 3 0 2
54 Number of officers in resident schools in the THS account (the "personal account" in the inventory of officers--THS stands for Transient, Hospital, School).	120 95 99 50 18	100 100 100 100 0	150 114 106 90 22	200 120 110 60 41	200 110 110 50 37	200 111 98 50 44	8 5 5 2 2	10 5 4 3 2
55 Number of active Army officers in TOE (Table of Organization and Equipment) account.	110 97 95 80 9	100 100 100 100 0	120 106 110 95 7	140 112 110 90 12	150 111 110 80 16	150 106 105 80 18	7 4 5 0 2	10 4 3 0 3

TRENDS - ORDERED BY TREND NUMBER

Consequences for  
CPDS if this fore-  
cast actually  
materializes (0-10)

TREND

	1	2	3	4	5	6	POS	NEG
	1975	1984	1990	1995	2005	2025		
55 Degree to which the Officer Professional Development System meets Army needs.	300 110 90 60 60	100 100 100 100 0	300 115 100 90 50	300 120 110 50 52	300 123 110 20 59	300 129 120 10 61	9 4 3 0 2	10 4 3 0 4
57 Soviet power projections in Third World countries.	110 82 90 10 25	100 100 100 100 0	225 120 110 100 29	275 137 120 95 46	300 138 120 50 59	400 142 120 25 92	7 3 2 0 2	9 4 4 0 3
58 Level of tension between the USSR and the US.	110 80 90 10 27	100 100 100 100 0	170 111 171 80 33	200 116 100 80 34	220 108 100 75 33	150 98 100 50 26	8 3 3 0 3	8 3 3 0 3
59 Extent to which the threat imposes a requirement that the Army be able to fight in vastly different physical environments.	100 91 90 75 7	100 100 100 100 0	150 115 110 100 15	200 126 120 100 24	200 136 123 100 31	230 157 150 100 40	7 2 3 0 2	7 3 4 0 2
60 Index of Army peacetime functions which could be civilianized and/or contracted out.	110 83 85 50 16	100 100 100 100 0	125 117 120 98 8	175 136 138 98 20	200 153 150 95 30	300 177 180 90 58	10 4 4 2 2	8 5 5 1 2



TRENDS - ORDERED BY TREND NUMBER

TR:40	1	2	3	4	5	6	Consequences for O&DS if this forecast actually materializes (0-10)
	1975	1984	1990	1995	2005	2025	POS NEG
61 Number of 22-30 year olds who have graduated from college.	130 MAX 93 MEAN 93 MDN 15 MIN 22 SD	100 100 100 100 0	120 102 105 80 10	120 102 100 70 16	140 174 100 75 20	200 121 120 65 32	8 4 5 0 2 3
62 Number of 22-30 year olds who have science/engineering degrees.	125 MAX 92 MEAN 100 MDN 15 MIN 28 SD	100 100 100 100 0	120 103 105 90 8	150 111 110 95 12	160 120 120 90 15	300 146 125 90 57	10 5 5 0 2 3
63 Tendency for joint activities to replace service unique activities (i.e., more centralized DOP).	99 MAX 79 MEAN 80 MDN 10 MIN 23 SD	100 100 100 100 0	150 119 110 100 19	250 138 120 107 40	500 170 138 110 103	1000 228 165 110 235	10 5 5 2 2 3
64 The level of stress on officers in combat.	120 MAX 94 MEAN 98 MDN 75 MIN 12 SD	100 100 100 100 0	150 108 100 90 15	200 126 120 96 34	210 133 130 94 36	230 148 145 90 47	5 2 2 0 2 3
65 Degree to which Defense spending is forced below required mission levels due to increased expenditures for health, education, welfare and other transfer payments.	150 MAX 119 MEAN 115 MDN 90 MIN 21 SD	100 100 100 100 0	150 103 170 90 13	175 109 100 85 21	200 116 100 80 33	250 123 100 75 42	10 8 5 1 0 3

TRENDS - ORDERED BY TREND NUMBER

Consequences for CPDS if this forecast actually materializes (0-10)

TREND

	1	2	3	4	5	6	POS	NEG
	1975	1984	1990	1995	2005	2025		
66 Level of Army esprit de corps.	110 MAX 110 MEAN 76 MDN 80 MIN 50 SD 18	100 100 100 100 100 100 100 100 100 100 100	150 111 109 105 90 16	175 113 110 80 24	150 116 113 90 23	160 125 123 90 24	10 6 5 0 3	7 2 0 0 3
67 The ability of junior commissioned officers, warrant officers and noncommissioned officers to replace senior leaders lost in combat.	110 MAX 94 MEAN 95 MDN 75 MIN 12 SD	100 100 100 100 100 100 100 100 0	175 106 100 80 23	150 103 100 50 24	200 108 100 50 39	300 120 103 20 68	7 4 4 0 2	10 5 3 0 4
68 Degree to which non-majority languages, customs and heritages are integrated into the Army.	120 MAX 80 MEAN 90 MDN 10 MIN 28 SD	100 100 100 100 100 100 100 100 0	150 119 110 90 20	200 137 125 80 39	250 164 152 80 61	400 207 200 80 101	10 4 4 0 3	10 4 3 0 3
69 Changes in sociological factors and events that detract from traditional military discipline and way of life	100 MAX 83 MEAN 85 MDN 65 MIN 10 SD	100 100 100 100 100 100 100 100 0	200 139 130 105 74	400 185 170 100 89	800 249 200 80 197	1600 381 225 80 420	8 4 4 0 3	10 6 5 0 3
70 Level of military service experience in Congress.	250 MAX 113 MEAN 110 MDN 5 MIN 56 SD	100 100 100 100 100 100 100 100 0	110 27 90 50 16	120 71 80 25 26	140 53 55 0 39	200 46 20 0 61	5 1 1 0 2	8 7 7 5 1

151

TRENDS - ORDERED BY TREND NUMBER

TREND	1	2	3	4	5	6	Consequences for OPDS if this forecast actually materialize: (0-10)
	1975	1984	1990	1995	2005	2025	POS NEG
71 Availability of sophisticated training systems at unit level (e.g., video-disk).	100 46 38 0 28	100 100 100 100 0	200 124 115 100 35	300 158 145 102 46	1000 264 180 105 216	10000 976 250 110 2505	7 1 7 2 2
	MAX MEAN MDN MIN SD						
72 US National will to support military defense operations.	99 65 75 4 28	100 100 100 100 0	150 108 105 60 19	150 109 100 75 24	175 116 105 86 28	175 113 100 70 27	10 4 4 0 3
	MAX MEAN MDN MIN SD						
73 Congressional support for the military.	125 74 80 4 29	100 100 100 100 0	150 111 105 75 20	175 112 110 70 24	175 112 105 80 24	175 113 105 70 25	9 3 3 0 3
	MAX MEAN MDN MIN SD						

```

OPD*PFHOLD(1)*TRE*MS/PROG(U)
1 COMPILER('PROP=RLOW)
2 PARAMETER NROW=91, NCOL=8, IANS=19, NUMPRT=5
3 INTEGER DATA(IANS, NROW, NCOL), ORD(IANS, 2), ORDPR1 (NROW, 2),
4 1DISPL(NROW, 5, NCOL), INPUT(NCOL), CHECK(2, NCOL), NUMBER(NROW),
5 2PRINT(NROW, NUMPRT), NEXT(2)
6 DIMENSION TRASH(13), PRTLAB(2), NUMPRT, ROWLAB(5)
7 DATA PRTLAB/ 'TREND', 'NUMBER', 'COL 7', 'MEAN',
8 'COL 8', 'MEAN' /
9 1 DATA ROWLAB/ 'MAX', 'MEAN', 'MDN', 'MIN', 'SD' /
10 DATA CHECK/ '0.2000000', '0.2000000', '0.2000000', '0.2000000', '0.2000000',
11 '0.2000000', '0.2000000', '0.2000000', '0.2000000', '0.2000000',
12 '0.2000000', '0.2000000', '0.2000000', '0.2000000',
13 C READ A LINE OF DATA
14 C
15 C NUMREC=NUMREC+1
16 READ (5, 19, ERR=4, END=5) I, INPUT
17 C
18 C CHECK FOR BAD ITEM NUMBER
19 C
20 C IF (I.LT.1.OR.I.GT.NROW) GO TO 4
21 NUMBER(I)=NUMBER(I)+1
22 IF (NUMBER(I).LT.1.OR.NUMBER(I).GT.IANS) GO TO 4
23 C
24 C CHECK FOR BAD DATA
25 C
26 DO 2 J=1, NCOL
27 IF (INPUT(J).EQ.-1.OR.(INPUT(J).GE.CHECK(1, J).AND.INPUT(J).LE.CHEC
28 1K(2, J))) GO TO 2
29 GO TO 4
30 CONTINUE
31 C
32 C UPDATE ARRAYS
33 C
34 INDEX=NUMBER(I)
35 DO 3 J=1, NCOL
36 DATA(INDEX, I, J)=INPUT(J)
37 CONTINUE
38 GO TO 1
39 C
40 C WRITE BAD DATA WARNING
41 C
42 NBAD=NBAD+1
43 READ (6, 20) TRASH
44 WRITE (6, 21) NUMPR1C, TRASH
45 GO TO 1
46 DO 6 I=1, NROW
47 IF (NUMBER(I).NE.IANS) WRITE (6, 22) I, NUMBER(I)

```

```

48      CONTINUE
49      C
50      C
51      C
52      DO 12 I=1,NRG
53      IF (NUMBER(I).LT.1.OR.NUMBER(I).GT.IANS) GO TO 12
54      LIM=NUMBER(I)
55      DO 7 J=1,NCOL
56      DISPL(I,4,J)=CHECK(2,J)
57      DO 11 J=1,NCOL
58      KOUNT=J
59      IM=0
60      DO 8 IND X=1,LIM
61      IF (DATA(INDEX,I,J).LT.C) GO TO 8
62      KOUNT=KOUNT+1
63      DISPL(I,1,J)=MAX(DISPL(I,1,J),DATA(INDEX,I,J))
64      DISPL(I,2,J)=DISPL(I,2,J)+DATA(INDEX,I,J)
65      NEXT(2)=DATA(INDEX,I,J)
66      NEXT(1)=I
67      CALL ORDER (ORD,IANS,NEXT,IM)
68      DISPL(I,4,J)=MIN(DISPL(I,4,J),DATA(INDEX,I,J))
69      DISPL(I,5,J)=DISPL(I,5,J)+DATA(INDEX,I,J)**2
70      CONTINUE
71      IF (KOUNT.EQ.0) GO TO 11
72      IF (MOD(KOUNT,2).EQ.0) GO TO 9
73      II=KOUNT+1
74      II=II/2
75      DISPL(I,3,J)=ORD(II,2)
76      GO TO 10
77      II=KOUNT/2
78      DISPL(I,3,J)=ORD(II,2)+ORD(II+1,2)
79      DISPL(I,3,J)=DISPL(I,3,J)/2+.5
80      RMU=DISPL(I,2,J)/KOUNT
81      DISPL(I,2,J)=RMU+.5
82      VARI=DISPL(I,5,J)/KOUNT
83      VAR2=VARI-RMU**2
84      IF (VAR2.GT.0.)DISPL(I,5,J)=SQRT(VAR2)+.5
85      IF (VAR2.LE.0.)DISPL(I,5,J)=0
86      IF (VAR2.LT.0.) WRITE (6,23) VAR2,I,J
87      CONTINUE
88      CONTINUE
89      C
90      C
91      C
92      COMPUTE DISPLAY ORDERS
93      DO 15 K=1,NUMPRT
94      IF (K.EQ.1) GO TO 14
95      IM=0
96      DO 13 I=1,NROW
97      IF (K.EQ.2)NEXT(2)=DISPL(I,2,7)
98      IF (K.EQ.3)NEXT(2)=DISPL(I,2,8)
99      NEXT(1)=1

```

```

99 CALL ORDER (ORDPRT,NROW,NEXT,IM)
100 CONTINUE
101 DO 15 I=1,NROW
102 IF (K.EQ.1) PRINT(I,K)=I
103 IF (K.NE.1) PRINT(I,K)=ORDPRT(1,1)
104 CONTINUE
105 C
106 C
107 C
108 WRITE DISPLAYS
109 DO 18 K=1,NUMPRT
110 DO 17 I=1,NROW
111 II=PRINT(I,K)
112 IF (MOD(I,5).EQ.1) WRITE (6,24) (PRTLAB(J,K),J=1,2),(J,J=1,NCOL)
113 IF (MOD(I,5).NE.1) WRITE (6,25)
114 DO 16 INDEX=1,5
115 IF (INDEX.NE.3) WRITE (6,27) ROWLAB(INDEX),(DISPL,II,INDEX,J),J=1,
116 NCOL)
117 IF (INDEX.EQ.3) WRITE (6,26) II,ROWLAB(INDEX),(DISPL(II,INDEX,J),J,
118 I=1,NCOL)
119 CONTINUE
120 CONTINUE
121 STOP
122 C
123 FORMAT (//)
124 FORMAT (1,3A6)
125 FORMAT (1,BAD DATA AT READ,15/1X,13A6)
126 FORMAT (1,QUESTION,14,HAS,13,RESPONSES)
127 FORMAT (1,WARNING,VAR2 = SQRT ,F14.0, FOR ,13,IJ)
128 FORMAT (1,70X,TRENDS - ORDERED BY ,2A6//1X,TREND,148X,6(1X,1
129 18),5X,12,3X,12//)
130 FORMAT (//)
131 FORMAT (2X,I3,45X,A4,6(1X,18),5X,I2,3X,I2)
132 FORMAT (2X,3X,45X,A4,6(1X,18),5X,I2,3X,I2)
133 SUBROUTINE ORDER (ORD,NUMORD,NEXT,IM)
134 INTEGER ORD(NUMORD,2),NEXT(2)
135 IF (IM.EQ.0) GO TO 20
136 DO 28 L=IM,1,-1
137 IF (NEXT(2).LE.ORD(L,2)) GO TO 30
138 DO 28 J=1,2
139 ORD(L+1,J)=ORD(L,J)
140 L=L-1
141 ORD(L+1,1)=NEXT(1)
142 ORD(L+1,2)=NEXT(2)
143 IM=IM+1
144 RETURN
145 END

```

```

1  OPU*PFHOLD(1),EVENTS/PROG(0)
2  COMPILER(PROP=RLJN)
3  PARAMETER NROW=1,NCOL=2,IAN5=19,NUMPRT=4
4  INTEGER DATA(IAN,NROW,NCOL),ORD(IAN5,2),ORDPRT(NROW,2),
5  1D,SPL(NROW,5,NCOL),INPUT(NCOL),CHECK(2,NCOL),NUMBER(NROW),
6  2PRINT(NROW,NUMPRT),NEXT(2)
7  3=N2050(NROW)
8  DIMENSION TRASH(13),PRTLAB(2),NUMPRT,ROWLAB(5)
9  DATA PRTLAB/ 'EVENT', 'NUMBER', 'COL', 'SD', 'SD'
10  1'COL', 'MEAN', 'MIN', 'SD'
11  DATA ROWLAB/ 'MAX', 'MEAN', 'MIN', 'SD'
12  DATA CHECK/ 0, 100, 0, 100, 0, 100, 0, 100, 0, 100, 1984, 2025, 0, 40, 0, 10, 0, 10/
13  C
14  C READ A LINE OF DATA
15  C
16  C NUMREC=NUMREC+1
17  C READ (5,19,ERR=4,END=5) I,INPUT
18  C
19  C CHECK FOR BAD ITEM NUMBER
20  C
21  C IF (I.LT.1.OR.I.GT.NROW) GO TO 4
22  C NUMBER(I)=NUMBER(I)+1
23  C IF (NUMBER(I).LT.1.OR.NUMBER(I).GT.IAN5) GO TO 4
24  C
25  C CHECK FOR BAD DATA
26  C
27  C DO 2 J=1,NCOL
28  C IF (J.EQ.6.AND.INPUT(J).EQ.2050) GO TO 2
29  C IF (INPUT(J).EQ.-1.OR.(INPUT(J).GE.CHECK(1,J).AND.INPUT(J).LE.CHECK
30  C 1K(2,J))) GO TO 2
31  C GO TO 4
32  C CONTINUE
33  C
34  C UPDATE ARRAYS
35  C
36  C INDEX=NUMBER(I)
37  C DO 3 J=1,NCOL
38  C IF (INPUT(J).LT.0) GO TO 7
39  C IF (J.EQ.6.AND.INPUT(J).EQ.2050)M2050(I)=M2050(I)+1
40  C DATA(INDEX,I,J)=INPUT(J)
41  C CONTINUE
42  C GO TO 1
43  C
44  C WRITE BAD DATA WARNING
45  C
46  C NBAD=NBAD+1
47  C READ (0,20) TRASH
48  C WRITE (6,71) NUMREC,TRASH
49  C GO TO 1
50  C DO 6 I=1,NROW
51  C IF (NUMBER(I).NE.IAN5) WRITE (6,22) I,NUMBER(I)

```

```

51 CONTINUE
52
53 CALCULATE DISPLAY STATS
54 C
55 C
56 C
57
58 DO 12 I=1,NROW
59 IF (NUMBER(I).LT.1.OR.NUMBER(I).GT.IANS) GO TO 12
60 LIM=NUMBER(I)
61 DO 7 J=1,NCOL
62 DISPL(1,4,J)=CHECK(2,J)
63 KOUNT=0
64 IM=0
65 DO 8 INDEX=1,LIM
66 IF (DATA(INDEX,1,J).LT.0) GO TO 8
67 IF (J.EQ.6.AND.DATA(INDEX,1,6).EQ.2050) GO TO 8
68 KOUNT=KOUNT+1
69 DISPL(1,1,J)=MAX0(DISPL(1,1,J),DATA(INDEX,1,J))
70 DISPL(1,2,J)=DISPL(1,2,J)+DATA(INDEX,1,J)
71 NEXT(2)=DATA(INDEX,1,J)
72 NEXT(1)=I
73 CALL ORDER (ORD,IANS,NEXT,IM)
74 DISPL(1,4,J)=MIN0(DISPL(1,4,J),DATA(INDEX,1,J))
75 DISPL(1,5,J)=DISPL(1,5,J)+DATA(INDEX,1,J)**2
76 CONTINUE
77 IF (KOUNT.EQ.0) GO TO 11
78 IF (MOD(KOUNT,2).EQ.0) GO TO 9
79 II=KOUNT+1
80 II=II/2
81 DISPL(1,3,J)=ORD(II,2)
82 GO TO 10
83 II=KOUNT/2
84 DISPL(1,5,J)=ORD(II,2)+ORD(II+1,2)
85 DISPL(1,3,J)=DISPL(1,3,J)/2+.5
86 RMU=DISPL(1,2,J)/KOUNT
87 DISPL(1,2,J)=RMU*.5
88 VAR1=DISPL(1,5,J)/KOUNT
89 VAR2=VAR1-RMU**2.
90 DISPL(1,5,J)=SQRT(VAR2)+.5
91 CONTINUE
92 CONTINUE
93 COMPUTE DISPLAY ORDERS
94 C
95 C
96 C
97 C
98 DO 15 K=1,NUMPRT
99 IF (K.EQ.1) GO TO 14
100 IM=0
101 DO 13 I=1,NROW
102 IF (K.EQ.2)NEXT(2)=DISPL(1,5,I)
103 IF (K.EQ.3)NEXT(2)=DISPL(1,2,B)
104 IF (K.EQ.4)NEXT(2)=DISPL(1,2,9)
105 NEXT(1)=I
106 CALL ORDER (ORDPRT,NROW,NEXT,IM)

```



```

103 CONTINUE
104 DO 15 I=1,NROW
105 IF(K.EQ.1)PRINT(I,K)=I
106 IF(K.NE.1)PRINT(I,K)=ORDPRT(I,1)
107 CONTINUE
108 C
109 C
110 WRITE DISPLAYS
111 DO 18 K=1,NUMPRT
112 DO 17 I=1,NROW
113 II=PRINT(I,K)
114 IF (MOD(I,5).EQ.1) WRITE (6,23) (PRTLAB(J,K),J=1,2),(J,J=1,NCOL)
115 IF (MOD(I,5).NE.1) WRITE (6,24)
116 DO 16 INDEX 1,5
        6,27) ROWLAB(INDEX),(DISPL(II,INDEX,J),J=1,
        6,26) II,ROWLAB(INDEX),(DISPL(II,INDEX,J),J

```

```

122 ( )
123 CONTINUE
124 CONTINUE
125 STOP
126 C
127 FORMAT (13A6)
128 FORMAT (BAD DATA AT HEAD,15/1,13A6)
129 FORMAT (QUESTION,14, HAS,13, RESPONSES)
130 FORMAT (1,70X,EVENTS - ORDERED BY ,2A6//1X,EVENT,49X,5(13,4
131 1X),2,6X,I2,6X,I2,4X,I2//)
132 FORMAT (//)
133 FORMAT (/T91,14, NEVER)
134 FORMAT (2X,I3,45X,A4,1X,5(13,4X),I4,6X,I2,6X,I2,4X,I2)
135 FORMAT (2X,3X,45X,A4,1X,5(13,4X),I4,6X,I2,6X,I2,4X,I2)
136 SUBROUTINE ORDER (ORD,NUMORD,NEXT,IM)
137 INTEGER ORD(NUM ORD,2),NEXT(2)
138 IF (IM.EQ.0) GO TO 29
139 DO 28 L=IM,1,-1
140 IF (NEXT(2).LE.ORD(L,2)) GO TO 30
141 DO 28 J=1,2
142 ORD(L+1,J)=ORD(L,J)
143 L=L-1
144 ORD(L+1,1)=NEXT(1)
145 ORD(L+1,2)=NEXT(2)
146 IM=IM+1
147 RETURN
148 END

```

SPRT,S OPD,PHOLD,TRENDS,PROG

## Appendix 6 to Annex II

### Description Of The Final PDOS INTERAX Database

1. **PURPOSE.** To present a description of the final PDOS INTERAX database.

2. **Discussion.**

a. The INTERAX database has two parts: an event and trend model which contains the universe of events and trends and their nominal data; and a cross-impact model which contains the cross-impacts of events-on-events and events-on-trends (see Appendix 9 for a definition of events and trends). These two models together contain the total PDOS INTERAX database.

(1) The event and trend model contains cumulative probabilities of occurrence for each event and forecasts of trend levels for each trend throughout the length of the model (1984-2025). Some of this data came from the DELPHI process, some came from analysis of information obtained by the Futures Team after the DELPHI was concluded. This model describes the future as we expect it to develop, minus the interactions among the events and between the events and the trends which we expect to occur. Events can either be "recurring" (can happen more than once in a computer simulation) or "one-time" events. The PDOS event model contains 13 recurring events and 66 one-time events for a total of 79 events. The trend model contains 65 trends, five of which are combinations of other trends (e.g., one trend is "number of officers in TOE Army," another is "number of enlisted in TOE Army;" one combined trend is "total personnel in TOE Army"). The term used to describe combined trends is "computed trend." Each trend has a forecasted value for each time period and as with the events, some data came from the DELPHI process while others came from later information. All PDOS trend values are not from real data or values. They are relative numbers and all have a value of "1.00" for 1984. Were real data ever obtained on a given trend, the real data could be multiplied by the PDOS trend value to obtain a "real" forecasted number. This is referred to as an "index" value.

This feature of INTERAX allows the analyst to make relative forecasts before data on the current status is known.

(2) The cross-impact model contains a "simple" cross-impact matrix and a "complex" or detailed cross-impact listing. These cross-impacts describe the interactions we expect would occur among the events and between the events and the trends in the event and trend model described above. The simple cross-impact matrix is a matrix of "hits" and "misses" among the events and between the events and trends and shows the "hits" by displaying the maximum amount of impact expected when the event occurs in a computer simulation. The complex cross-impact listing shows the complete affect of a given event on another event or a trend when that event occurs in a computer simulation. The analyst can input a complete curve of the cross-impact showing the amount of impact and the timing instead of merely inputting a single value. The information contained in the complex cross-impact curve is:

(a) The identifying numbers of the impacting event and the impacted event or trend.

(b) The "basis" of the cross-impact (i.e., expected value or base line). A "base line" cross-impact comes into play only when the impacting event actually occurs in a computer simulation, while an "expected value" cross-impact is applied in one direction when the event occurs but is applied in the opposite direction when the event does not occur in a computer simulation. As an example: one can visualize that a pay raise will have a positive impact on Army esprit de corps; one can, also, visualize that were a pay raise actually expected by the Army, but at the last moment political events arose which caused the President to freeze pay at the former level, then the impact of the "non-occurrence" of an expected pay raise will have a reverse effect. Therefore, the cross-impact of the event "Army institutes a pay-raise" on the trend "Army esprit de corps" is an "expected value" cross-impact.

(c) The maximum level of the impact.

(d) The level of the impact when the affect stabilizes and remains the same throughout the rest of the computer simulation.

(e) The time, expressed in years, which passes from the occurrence of the impacting event in a computer simulation until it first impacts on the impacted event or trend.

(f) The time, in years, which passes from the occurrence of the impacting event until the maximum impact is "felt" on the impacted event or trend.

(g) The time, in years, which passes from the occurrence of the impacting event until the maximum impact stops.

(h) The time, in years, which passes from the occurrence of the impacting event until the impact stabilizes.

b. Attached at Tab A is a computer listing of the final PDOS INTERAX model. The following is a description of each section of that listing.

(1) The first section of the listing (II-6-A-1) gives a description of the model and includes the following:

(a) Name of the model.

(b) The first year during which events may occur.

(c) The time interval (in years) for initial event probabilities.

(d) The time interval (in years) for initial trend values.

(e) The year the initial trend data begins.

(f) The number of events.

(g) The total number of index trends (see Appendix 9 for a definition of the different types of trends).

(h) The number of real value trends (Note: The number of index trends, also, includes the number of real trends).

(i) The number of computed trends.

(j) The number of fixed trends (trends with nominal values that do not change).

(k) The number of event-event cross-impacts (see Appendix 9 for a definition of the different types of cross-impacts).

(l) The number of event-trend cross-impacts.

(2) The second section of the listing (pages II-6-A-1 thru II-6-A-6) shows one-time or non-recurring events and their initial cumulative probabilities for the entire time period (1984-2025). The events are listed by number (the INTERAX can hold 100 events) and their short title (no longer than 24 characters and spaces). Note that the base line year for the PDOS model is 1984 but the listing begins with 1986. The INTERAX model is limited to 20 time periods (1984-2024) and events can not occur before 1985 since 1984 is the baseline year. However, the model can create, using a straight-line method, interval probabilities for each year beginning in 1985 and ending in 2024, the last year events can occur. These interval probabilities can be seen in another computer listing known as a "4.2 report."

(3) The next section (pages II-6-A-6 thru II-6-A-7) shows the cumulative probabilities and short titles of the recurring events. There are 13 recurring events in the PDOS model. These events may occur more than once in a simulation but not more than once in any given year. They have the same impact each time they occur.

(4) The next section (pages II-6-A-7 thru II-6-A-14) is a listing of trends and their initial values beginning in 1984 (the baseline year) and ending at the end of 2024, the last year of the model. The maximum number of trends allowed in the model is 85. Trend values that have all values of "1.0" are called "index" trends. In general, these trends are system performance measures on which the occurrence and non-occurrence of impacting events will affect showing the relative change due to PDOS policies and external events during the time period simulated. As discussed in Appendix 9, the values of index trends at the end of a simulation may be used as a multiplier to calculate the real value of a trend provided the real value of the trend is known for 1984, the baseline year. If a trend value is computed (see trend 56, for example) the numbers of the two trends which add together to make the computed trend will be printed to the right of the computed trend values.

(5) The next section of the listing shows the cross-impact model. It begins with a listing of the simple event-on-event cross-impacts (pages II-6-A-14 thru II-6-A-37). The numbers listed down the left side of the matrix are the impacting event numbers. The numbers across the top of the matrix represent the impacted events. A value of ".00" inside the matrix means that the impacting event does not impact on the impacted event -there is no "hit" for the two events which

intersect at that point. A number greater than .00 at an intersection of two events means that there is a hit and the maximum impact is shown at the intersection. For example, there is no hit for event 4 on event 1 and there is a .00 at the intersection of those events. Event 3 impacts event 5 and the level of the impact is 1.20. This means that if event 3 occurs, it increases the probability of the occurrence of event 5 by a maximum of 20 percent.

(6) The next section shows a "complex" or detailed listing of event-on-event cross-impacts (pages II-6-A-37 thru II-6-A-46). Notice that the cross-impacts are grouped by impacting event and are in numerical order. The number in column 1 is the impacting event while the number in column 2 is the impacted event. Column 3 shows whether the cross-impact is expected value (E) or baseline (B). The non-occurrence of a baseline event will have no affect while the non-occurrence of an expected value event will have the reverse affect on the impacted event from that listed in the printout. Column 4 gives the maximum impact that the impacting event has on the impacted event. This impact can either be positive or negative. Column 5 shows the impact

of the event after it has reached a stable state. The next four columns (6-9) show various times from the time the impacting event occurs. Column 6 shows the time to first impact, column 7 shows the time to maximum impact, column 8 shows the time to the end of the maximum impact and column 9 shows the time until the impact reaches a stable state.

(7) The next section (pages II-6-A-46 thru II-6-A-66) shows the event-on-trend simple cross-impacts. The left hand column of the matrix lists the impacting events and the numbers across the top of the matrix show the impacted trends. The matrix is interpreted in the same manner as the simple event-on-event cross-impact matrix.

(8) The last section (pages II-6-A-66 thru II-6-A-78) is the complex or detailed event-on-trend cross-impact matrix. It is grouped by impacting event and is interpreted in the same manner as the detailed event-on-event cross-impact matrix.

Tab A — Computer Listing of Final PDOS INTERAX Model

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NORMAL-CASE ASCII:

EDIT

THIS MODEL IS CALLED:

TEST-1

FIRST YEAR DURING WHICH EVENTS CAN OCCUR = 1985

INPUT PERIODICITY FOR EVENTS = 2

FOR TRENDS = 2

INITIAL VALUES FOR TRENDS ARE FOR THE END OF 1984

NUMBER OF EVENTS = 79

NUMBER OF INDEX TRENDS = 69

NUMBER OF REAL VALUE TRENDS = 9

NUMBER OF COMPUTED TRENDS = 5

NUMBER OF FIXED TRENDS = 0

NUMBER OF EVENT-EVENT CROSS IMPACTS = 325

NUMBER OF EVENT-TREND CROSS IMPACTS = 477

ONE-TIME EVENTS:

=====

(CUMULATIVE PROBABILITIES THROUGH YEAR XXXX:)

	1986	1988	1990	1992	1994	1996	1998	2000
	2002	2004	2006	2008	2010	2012	2014	2016
	2018	2020	2022	2024				
2 GI BILL	.000	.000	.020	.070	.120	.200	.260	.330
	.400	.420	.460	.480	.500	.510	.520	.530
	.540	.550	.560	.560				
3 MIL GUAL STANDARDS TEST	.000	.000	.000	.010	.030	.040	.050	.120
	.200	.270	.290	.320	.340	.360	.380	.390
	.420	.440	.460	.480				
5 MEASURE OFFICER POTENTIAL	.000	.000	.009	.020	.030	.060	.110	.150
	.170	.180	.200	.220	.230	.250	.260	.280
	.290	.310	.320	.330				
6 ABILITIES/REQTS MATCH	.000	.000	.030	.060	.090	.130	.170	.210
	.240	.270	.300	.330	.370	.420	.450	.470
	.500	.530	.560	.580				
8 UNAUTHORIZED NUCLEAR LAU	.000	.000	.000	.000	.000	.000	.000	.000
	.001	.003	.005	.005	.006	.006	.007	.008
	.008	.009	.009	.010				
9 ARMY TO CONTROL RIOTS	.010	.030	.040	.060	.120	.160	.190	.230
	.260	.280	.310	.330	.350	.360	.380	.410
	.430	.450	.480	.510				
10 RETIREMENT CHANGES EXTEN	.020	.100	.170	.230	.280	.370	.420	.490
	.550	.630	.700	.720	.740	.760	.770	.780
	.800	.810	.820	.830				
11 RESERVE MOBILIZED	.005	.010	.020	.050	.100	.150	.170	.190
	.210	.220	.230	.240	.250	.260	.270	.275

	.280	.285	.290	.300				
12 AC COMMANDS RC BATTALION								
	.000	.000	.010	.020	.040	.060	.120	.200
	.240	.260	.290	.330	.360	.380	.410	.440
	.460	.480	.500	.520				
13 US IN MID/HIGH CONV WAR								
	.020	.040	.070	.120	.170	.230	.260	.280
	.300	.320	.340	.350	.360	.370	.380	.385
	.390	.400	.410	.420				
14 WOMEN UNRESTRICTED								
	.000	.005	.010	.020	.050	.120	.200	.240
	.270	.320	.350	.380	.400	.420	.440	.450
	.460	.470	.480	.500				
16 US IN BIO/CHEM WAR								
	.010	.030	.050	.080	.140	.190	.220	.250
	.270	.290	.320	.340	.350	.360	.370	.380
	.390	.400	.410	.420				
18 LIFE-SPAN INCREASED								
	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.050	.250	.300	.400	.410	.420	.430
	.440	.460	.480	.500				
19 NEW ACFT TRANSPORTER								
	.000	.000	.000	.000	.000	.000	.000	.050
	.100	.200	.300	.400	.500	.550	.600	.650
	.700	.730	.770	.800				
22 OTHER SVCS IN ARMY								
	.000	.000	.050	.070	.100	.120	.150	.200
	.250	.270	.300	.350	.400	.450	.500	.600
	.700	.820	.870	.950				
26 3-YR COMMAND TOURS								
	.000	.030	.070	.110	.140	.170	.230	.250
	.270	.280	.300	.330	.330	.340	.350	.360
	.370	.380	.390	.400				
27 INTERN MIL FORCE								
	.000	.000	.000	.010	.030	.040	.050	.060
	.080	.090	.110	.120	.130	.140	.160	.170
	.180	.190	.195	.200				
28 ARMY 21 ADOPTED								
	.000	.000	.050	.100	.150	.200	.400	.800
	.900	.990	.990	.990	.990	.990	.990	.990
	.990	.990	.990	.990				
29 IMPROVED HUMAN MEMORY								
	.000	.000	.001	.005	.010	.020	.030	.050
	.070	.090	.110	.140	.170	.190	.210	.240
	.260	.280	.300	.330				
30 US WITHDRAWS FROM NATO								
	.000	.010	.020	.040	.050	.070	.090	.120
	.140	.170	.200	.212	.218	.224	.230	.236
	.240	.246	.254	.260				
31 ARMY ADOPTS LINE/STAFF M								
	.030	.070	.120	.160	.230	.290	.320	.350
	.370	.400	.430	.440	.450	.460	.470	.480
	.500	.510	.520	.530				
33 ARMY ESTAB ENTR REQTS								
	.010	.400	.500	.600	.750	.900	.950	.990
	.990	.990	.990	.990	.990	.990	.990	.990
	.990	.990	.990	.990				

35	MEXICO TURNS COMMUNIST							
	.000	.000	.010	.020	.030	.060	.080	.120
	.130	.140	.160	.170	.190	.200	.210	.220
	.230	.240	.250	.260				
36	LATERAL ENTRY OF CIVS							
	.000	.020	.040	.060	.140	.260	.370	.400
	.430	.460	.500	.550	.560	.575	.590	.610
	.620	.630	.640	.650				
37	FRANCE REJOINS NATO							
	.010	.030	.050	.070	.100	.150	.160	.170
	.180	.190	.200	.210	.220	.230	.235	.240
	.245	.250	.255	.260				
38	US WITHDRAWS TROOPS							
	.000	.000	.010	.050	.100	.150	.200	.250
	.300	.350	.400	.450	.490	.500	.520	.530
	.550	.560	.570	.580				
39	MANDATORY NATNL SVC							
	.000	.000	.000	.001	.005	.010	.050	.100
	.150	.200	.250	.300	.350	.410	.440	.470
	.520	.560	.590	.620				
40	REDUCED ACQUISITION TIME							
	.000	.030	.080	.150	.220	.320	.410	.450
	.480	.520	.550	.580	.600	.620	.640	.660
	.670	.690	.700	.720				
41	70% STDNTS USE COMPUTERS							
	.000	.030	.110	.180	.220	.260	.470	.500
	.530	.560	.620	.650	.680	.700	.720	.740
	.750	.760	.780	.800				
42	ELECT DE INSTALLED							
	.200	.300	.500	.600	.700	.800	.850	.900
	.910	.920	.930	.940	.950	.960	.970	.980
	.990	.990	.990	.990				
43	MERIT PAY FOR OFFICERS							
	.000	.000	.000	.020	.040	.050	.070	.090
	.130	.150	.180	.200	.220	.240	.260	.270
	.280	.300	.320	.330				
44	VESTED RETIREMENT							
	.000	.000	.000	.000	.000	.010	.020	.060
	.120	.180	.240	.270	.310	.340	.370	.400
	.430	.460	.490	.510				
45	DEPRESSION							
	.020	.040	.060	.080	.110	.140	.160	.170
	.180	.200	.210	.220	.230	.240	.250	.260
	.270	.280	.285	.290				
46	ARMY INSTALLS CBI							
	.000	.000	.000	.000	.050	.150	.200	.250
	.270	.300	.350	.400	.500	.550	.600	.650
	.700	.750	.850	.990				
47	ARMY ESTAB ASSMT CNTRS							
	.000	.000	.000	.000	.000	.000	.050	.100
	.200	.300	.400	.500	.550	.600	.650	.700
	.750	.770	.790	.800				
48	SELF-ASSESSMENT TESTING							
	.000	.000	.010	.100	.200	.300	.400	.500
	.600	.700	.800	.900	.990	.990	.990	.990
	.990	.990	.990	.990				
49	ARMY PATROLS MEX BORDER							

	.000	.000	.000	.005	.010	.020	.030	.040
	.060	.080	.100	.120	.130	.150	.160	.170
	.180	.190	.200	.210				
50	RESERVES ASGD NATO MSN							
	.000	.005	.010	.020	.030	.060	.080	.090
	.110	.120	.130	.150	.160	.165	.170	.175
	.180	.190	.200	.210				
51	US MIL FORCES COMBINED							
	.000	.000	.000	.000	.000	.001	.005	.008
	.013	.018	.020	.026	.032	.038	.044	.050
	.060	.065	.070	.080				
53	COMPETENCY TESTS ESTAB							
	.000	.000	.000	.010	.030	.040	.050	.120
	.200	.270	.290	.320	.340	.360	.380	.390
	.420	.440	.460	.480				
54	PC FOR OFFICERS							
	.000	.000	.000	.000	.050	.250	.400	.500
	.500	.500	.500	.500	.500	.500	.500	.500
	.500	.500	.500	.500				
55	CORPORATE SCHOLARSHIPS							
	.040	.080	.150	.210	.300	.370	.420	.450
	.500	.530	.580	.590	.620	.610	.620	.630
	.640	.650	.655	.660				
57	GRAD DEGREES BY COMPUTER							
	.000	.000	.005	.010	.020	.030	.070	.110
	.130	.160	.180	.220	.250	.270	.290	.330
	.350	.370	.400	.440				
62	RAPID LEARNING							
	.000	.000	.000	.000	.000	.000	.000	.006
	.009	.020	.050	.080	.100	.120	.140	.160
	.180	.220	.260	.320				
63	CHEAP FOOD							
	.000	.000	.020	.050	.090	.150	.200	.270
	.310	.350	.400	.440	.480	.510	.530	.560
	.580	.620	.630	.650				
64	DUAL LANGUAGE REQT							
	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.010	.010	.040	.050	.060	.070	.080
	.100	.120	.140	.150				
65	FIELD DECISION SUPPORT S							
	.000	.000	.020	.040	.060	.090	.170	.280
	.320	.370	.430	.470	.520	.550	.570	.590
	.610	.630	.650	.670				
66	ARMY PROTECTS DOMESTIC I							
	.000	.000	.003	.005	.008	.010	.015	.020
	.025	.030	.040	.050	.060	.070	.080	.100
	.110	.130	.140	.150				
70	ELECTRONIC WARGAMES							
	.050	.150	.240	.330	.410	.490	.550	.600
	.640	.670	.750	.760	.790	.810	.830	.840
	.850	.870	.880	.900				
71	5TH GENERATION COMPUTER							
	.000	.020	.030	.040	.070	.080	.100	.120
	.130	.140	.150	.160	.170	.180	.190	.195
	.198	.200	.205	.210				
73	SUPER-POWERFUL HAND-HELD							
	.000	.000	.000	.000	.010	.150	.200	.250



	.350	.450	.500	.550	.650	.700	.750	.800
	.850	.900	.950	.990				
74 US SPACE DEPT CREATED								
	.050	.110	.220	.300	.390	.480	.540	.580
	.630	.660	.720	.760	.770	.780	.790	.800
	.810	.815	.820	.830				
75 CRAZY STATE GETS NUKE CA								
	.060	.210	.330	.450	.530	.620	.660	.700
	.730	.760	.770	.780	.790	.800	.805	.810
	.813	.815	.818	.820				
77 50% DROP ROTC								
	.000	.000	.020	.040	.060	.080	.090	.100
	.120	.130	.150	.170	.200	.210	.220	.230
	.235	.240	.245	.250				
78 NO INTELLECTUAL DEFICIEN								
	.000	.000	.000	.000	.000	.001	.005	.009
	.018	.030	.040	.050	.060	.070	.090	.110
	.140	.160	.180	.210				
79 ANTI-ARMS DEMONSTRATIONS								
	.000	.050	.100	.160	.240	.320	.400	.420
	.440	.460	.480	.500	.520	.530	.540	.550
	.560	.570	.580	.600				
81 FEDEFAL SCHOLARSHIPS								
	.000	.000	.000	.015	.020	.040	.070	.090
	.110	.140	.160	.180	.210	.220	.230	.240
	.250	.260	.280	.300				
82 COMMON CORE SKILLS ESTAB								
	.000	.000	.000	.010	.030	.040	.050	.120
	.200	.270	.290	.320	.340	.360	.380	.390
	.420	.440	.460	.480				
83 FORMALIZED PD PROG ESTAB								
	.010	.500	.620	.750	.770	.790	.800	.850
	.900	.900	.900	.900	.900	.900	.900	.900
	.900	.900	.900	.900				
84 SCHOOL EXP REQD								
	.010	.750	.900	.920	.950	.970	.990	.990
	.990	.990	.990	.990	.990	.990	.990	.990
	.990	.990	.990	.990				
85 WARRIOR SPIRIT PROG EST								
	.010	.250	.450	.500	.500	.500	.500	.500
	.500	.500	.500	.500	.500	.500	.500	.500
	.500	.500	.500	.500				
92 SOFTWARE REVOLUTION								
	.000	.000	.000	.000	.050	.100	.150	.200
	.250	.300	.350	.400	.450	.500	.550	.600
	.650	.700	.750	.800				
95 EURCPE TOURS SHORTENED								
	.000	.000	.000	.000	.050	.100	.150	.200
	.250	.300	.350	.400	.450	.500	.500	.500
	.500	.500	.500	.500				
97 REDUCED EXPERT/INTERGRATOR								
	.020	.040	.070	.120	.170	.230	.260	.280
	.300	.320	.340	.350	.360	.370	.380	.385
	.390	.400	.410	.420				
98 MODERN EQUIPMENT								
	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.200	.250	.350	.500	.600	.700	.800

.900	.950	.990	.990					
99 INCR IN OFF ASSESSIONS								
.020	.040	.070	.120	.170	.230	.260	.280	
.300	.320	.340	.350	.360	.370	.380	.385	
.390	.400	.410	.420					

ANNUAL RECURRING EVENTS:  
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(ANNUAL PROBABILITIES DURING INTERVALS ENDING IN YEAR XXXX)

	1986	1988	1990	1992	1994	1996	1998	2000
	2002	2004	2006	2008	2010	2012	2014	2016
	2018	2020	2022	2024				
15 US IN LOW-INTENSITY WAR								
	.050	.140	.140	.020	.050	.070	.050	.020
	.030	.030	.030	.030	.010	.020	.030	.005
	.005	.005	.005	.005				
52 ANTI-MIL MEDIA CAMPAIGN								
	.060	.090	.080	.060	.050	.070	.020	.020
	.040	.020	.020	.010	.010	.010	.020	.020
	.010	.010	.005	.005				
58 US PROTECTS FOREIGN SUPP								
	.010	.020	.040	.030	.100	.135	.014	.020
	.045	.035	.005	.026	.024	.022	.043	.023
	.023	.023	.023	.023				
80 WIDE-SPREAD RIOTS								
	.000	.000	.000	.010	.010	.020	.010	.020
	.030	.040	.040	.040	.040	.040	.040	.040
	.040	.040	.040	.040				
86 ECONOMY TURNS GOOD								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
87 DOD BUDGET GREATLY CUT								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
88 SAT SCORES DECLINE								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
89 LIVE AMMO USE REDUCED								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
90 SPARE PARTS REDUCED								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
91 OIL SHORTAGE HITS ARMY								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030				
93 OFFICERS CENSURED								
	.020	.030	.020	.030	.020	.030	.020	.030
	.020	.030	.020	.030	.020	.030	.020	.030

.020	.030	.020	.030				
94 CMD TIME, ONE YEAR							
.020	.030	.020	.030	.020	.030	.020	.030
.020	.030	.020	.030	.020	.030	.020	.030
.020	.030	.020	.030				
96 QUALITY OFFS TO TOE							
.020	.030	.020	.030	.020	.030	.020	.030
.020	.030	.020	.030	.020	.030	.020	.030
.020	.030	.020	.030				

TRENDS: END OF YEAR XXXX  
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	1984	1986	1988	1990	1992
	1994	1996	1998	2000	2002
	2004	2006	2008	2010	2012
	2014	2016	2018	2020	2022
	2024				
1 LOSS OF OFFICERS TO CIV					
	1.00	1.10	1.20	1.23	1.27
	1.30	1.32	1.34	1.36	1.38
	1.40	1.41	1.42	1.43	1.44
	1.45	1.46	1.47	1.48	1.49
	1.50				
2 % PCS REGT COMPUTER USE					
	1.00	1.50	2.00	2.67	3.33
	4.00	4.40	4.80	5.20	5.60
	6.00	6.40	6.80	7.20	7.60
	8.00	8.40	8.80	9.20	9.60
	10.00				
3 OFFICERS USING COMPUTERS					
	1.00	1.50	2.00	2.67	3.33
	4.00	4.40	4.80	5.20	5.60
	6.00	6.90	7.80	8.70	9.60
	10.50	11.40	12.30	13.20	14.10
	15.00				
4 % OF WOMEN IN ARMY					
	1.00	1.05	1.10	1.12	1.13
	1.15	1.19	1.23	1.27	1.31
	1.35	1.36	1.38	1.39	1.41
	1.42	1.44	1.45	1.47	1.48
	1.50				
5 NO. LTS IN AC ARMY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
6 REGT FOR ENG & TECH SKIL					
	1.00	1.13	1.25	1.30	1.35
	1.40	1.47	1.54	1.61	1.68
	1.75	1.78	1.80	1.87	1.85
	1.88	1.90	1.92	1.95	1.97
	2.00				
7 % DEFICIENT IN BASIC SKI					
	1.00	.99	.98	.95	.93

	.90	.89	.88	.87	.86
	.85	.84	.84	.84	.83
	.83	.82	.81	.81	.80
	.80				
8 NO. CPTS IN AC ARMY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
9 NO. OF MAJS IN AC ARMY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
10 NO. LTCS IN AC ARMY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
11 TIME TO TRAIN CO GRADE					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
12 TIME TO TRAIN FIELD GRAD					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
13 AVERAGE TIS FOR OFFICERS					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
14 CGST OF OFFICER TNG & ED					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
15 NO. COLS IN AC ARMY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
16 CBT READINESS, CONV FORC					
	1.00	1.10	1.20	1.22	1.23
	1.25	1.28	1.31	1.34	1.37
	1.40	1.41	1.42	1.43	1.44
	1.45	1.46	1.47	1.48	1.49

	1.50					
17 NO. BGS & MGS IN AC ARMY						
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00					
18 NO. SR GENs IN AC ARMY						
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.00
	1.00					
19 US VS USSR TECHNOLOGY						
	1.00	1.00	1.00	.99	.99	
	.98	.97	.97	.96	.96	
	.95	.95	.95	.96	.96	
	.96	.96	.96	.97	.97	
	.97					
20 OFFICER RETRAIN REQ'T						
	1.00	1.13	1.25	1.33	1.42	
	1.50	1.58	1.66	1.74	1.82	
	1.90	1.91	1.92	1.93	1.94	
	1.95	1.96	1.97	1.98	1.99	
	2.00					
21 COMPUTER/COMMO-COMBAT						
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00					
22 COMPUTER/COMMO-SUPPORT						
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00					
23 COMPUTER/COMMO-TNG & ED						
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00					
26 NO. LTS IN THS ACCT						
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00					
27 NO. CPTS IN THS ACCT						
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00	1.00	1.00	1.00	1.00	
	1.00					
28 NO. MAJS IN THS ACCT						
	1.00	1.00	1.00	1.00	1.00	

1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
29 FORCE IN JOINT/COMBINE O				
1.00	1.10	1.20	1.28	1.37
1.45	1.49	1.52	1.56	1.59
1.63	1.66	1.69	1.73	1.76
1.79	1.82	1.85	1.89	1.92
1.95				
30 NO. LTCS IN THS ACCT				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
31 NO. COLS IN THS ACCT				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
32 PERCENT AC UNIT TNG & ED				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
33 CDRS ABIL IN MID/HI CBT				
1.00	1.00	1.00	1.03	1.07
1.10	1.13	1.16	1.19	1.22
1.25	1.25	1.26	1.27	1.27
1.26	1.28	1.28	1.29	1.30
1.30				
34 COST OF TAG & ED PCS				
1.00	1.05	1.10	1.13	1.17
1.20	1.26	1.32	1.38	1.44
1.50	1.53	1.57	1.61	1.64
1.67	1.71	1.75	1.78	1.81
1.35				
35 PERCENT IN-RES TNG/ED				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
36 PERCENT NON-RES TNG/ED				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
37 AVERAGE TIME IN TP 1				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00

1.00				
38 AVERAGE TIME IN TP 2				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
40 AVERAGE TIME IN TP 3				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
41 AVERAGE TIME IN TP 4				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
42 AVERAGE TIME IN TP 5				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
44 OFFICER WITH PC-HOME				
1.00	1.10	1.20	1.47	1.73
2.00	2.20	2.40	2.60	2.80
3.00	3.10	3.20	3.30	3.40
3.50	3.60	3.70	3.80	3.90
4.00				
46 MODERNIZATION OF EQUIP				
1.00	1.10	1.20	1.27	1.33
1.40	1.43	1.46	1.49	1.52
1.55	1.58	1.62	1.65	1.68
1.72	1.75	1.78	1.81	1.85
1.88				
47 GAP-RESERVE VS REQ				
1.00	1.10	1.20	1.30	1.40
1.50	1.48	1.46	1.44	1.42
1.40	1.40	1.40	1.40	1.40
1.40	1.40	1.40	1.40	1.40
1.40				
50 ARMY T & E BUDGET				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
51 LT SKL/APTITUDE LEVEL				
1.00	1.03	1.05	1.10	1.15
1.15	1.16	1.16	1.17	1.17
1.18	1.18	1.19	1.20	1.21
1.21	1.22	1.22	1.23	1.24
1.25				
52 NO. AC ENLISTED PERSONNEL				
1.00	1.00	1.00	1.01	1.01

1.01	1.01	1.01	1.01	1.01
1.01	1.01	1.02	1.02	1.02
1.02	1.02	1.02	1.02	1.02
1.03				
53 NO. AC TDA OFFICERS				
1.00	1.00	.99	.98	.97
.96	.95	.94	.93	.92
.91	.90	.89	.88	.88
.88	.87	.87	.86	.86
.85				
54 NO. AC OFFICERS IN THS				
2.00	2.00	2.00	2.00	2.00
2.00	2.00	2.00	2.00	2.00
2.00	2.00	2.00	2.00	2.00
2.00	2.00	2.00	2.00	2.00
2.00				
55 NO. AC OFFICERS IN TOE				
1.00	1.05	1.10	1.10	1.10
1.10	1.10	1.10	1.10	1.10
1.10	1.09	1.09	1.08	1.08
1.08	1.07	1.06	1.06	1.06
1.05				
56 NO. AC OFFICERS IN NON-FLD				
3.00	3.00	2.99	2.98	2.97
2.96	2.95	2.94	2.93	2.92
2.91	2.90	2.89	2.88	2.88
2.88	2.87	2.87	2.86	2.86
2.85				
57 TOTAL AC ARMY OFFICERS				
4.00	4.05	4.09	4.08	4.07
4.06	4.05	4.04	4.03	4.02
4.01	3.99	3.98	3.96	3.96
3.95	3.94	3.93	3.92	3.91
3.90				
58 TOTAL AC ARMY PERSONNEL				
5.00	5.05	5.09	5.09	5.08
5.07	5.06	5.05	5.04	5.03
5.12	5.00	5.00	4.98	4.98
4.97	4.96	4.95	4.94	4.93
4.93				
66 ARMY ESPIRIT DE CORPS				
1.00	1.03	1.05	1.07	1.08
1.10	1.11	1.11	1.12	1.12
1.13	1.14	1.15	1.16	1.17
1.18	1.19	1.20	1.21	1.22
1.23				
67 ABIL OF JR TO REPL SR				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.01	1.01	1.01
1.02	1.02	1.02	1.02	1.03
1.03				
68 PROFESSIONAL VALUES				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00



	1.00				
69 WARRIOR SPIRIT					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
70 LEADER-MENTOR					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
71 DECISION MAKING SKILLS					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
72 NATL WILL TO SUPT MILIT					
	1.00	1.03	1.05	1.03	1.02
	1.00	1.01	1.02	1.03	1.04
	1.05	1.05	1.04	1.03	1.03
	1.03	1.02	1.02	1.01	1.00
	1.00				
73 CONGR SPT FOR MILIT					
	1.00	1.03	1.05	1.07	1.08
	1.10	1.09	1.08	1.07	1.06
	1.05	1.05	1.05	1.05	1.05
	1.05	1.05	1.05	1.05	1.05
	1.05				
74 THREAT OFF SKILL PROFICY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
75 ART & SCIENCE OF WAR					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
76 EXPERT-INTEGRATOR					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
78 ARMY OFF SKILL PROFICY					
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00	1.00	1.00	1.00	1.00
	1.00				
80 COMMON OPNL LANGUAGE					
	1.00	1.00	1.00	1.00	1.00

1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
81 SELF-DEVELOPMENT				
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00
1.00				
83 ARMY-THREAT SKIL PROFICY				
.00	.00	.00	.00	.00
.00	.00	.00	.00	.00
.00	.00	.00	.00	.00
.00	.00	.00	.00	.00
.00				

CROSS IMPACTS OF EVENTS ON EVENTS:

CROSS IMPACT MATRIX:

	1	2	3	4	5	6	7	8
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	1.20	1.10	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	1.10	.00	.00	1.10	.00	.00
6	.00	.00	1.25	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	1.25	.75	.00	.00	.00	.00	1.05
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	1.25	.75	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	1.15	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00

31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	1.05	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	1.15	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.75	.00	.00	.00	.00	.00	.00
46	.00	.00	1.25	.00	.00	.00	.00	.00
47	.00	.00	1.50	.00	1.50	1.50	.00	.00
48	.00	.00	1.30	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	1.25	.00	1.15	1.15	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	1.20	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	1.20	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	1.15	.00	.00	.00	.00	.00
79	.00	.80	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.75	.00	.00	.00	.00	.00	.00
82	.00	.00	1.10	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	1.15	.00	1.10	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	1.20	.00	.00	.00	.00	.00	.00
87	.00	.75	.00	.00	.00	.00	.00	.00

88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	9	10	11	12	13	14	15	16
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	1.10	.00	1.05	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.80	.00	.00	.00	1.25	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	1.80	.00	1.25	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	1.25	.00	.00	1.25	.00	1.20
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	1.10	.00	.00	.00
16	.00	.00	.00	.00	1.20	1.25	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	1.25	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.75	.00	.85	.70
28	.00	.00	.00	.00	.00	1.15	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.80	.00	1.20	.00	.00	.00
31	.00	.00	.00	.00	.00	1.10	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.75	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00

43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.75	.00	.00	.00	.00	.00	.00
45	1.25	1.20	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	1.10	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	1.20	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.80	.00	.00	.00	.00	.80	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	1.25	.00	1.75	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.90	.00	.70	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.90	.00	.95	.00	.85	.75
80	1.50	.00	1.10	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.75	.90	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	1.20	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

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	17	18	19	20	21	22	23	24
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14	.00	.00	.00	.00	.00	.00	.00	.00
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16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
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19	.00	.00	.00	.00	.00	.00	.00	.00
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23	.00	.00	.00	.00	.00	.00	.00	.00
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39	.00	.00	.00	.00	.00	.00	.00	.00
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49	.00	.00	.00	.00	.00	.00	.00	.00
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56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
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71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
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81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.75	.00	.00	.00	.00	.00
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89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	25	26	27	28	29	30	31	32
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2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	1.10	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00

10	.00	1.20	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.80	.80	.00	.00	.75	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.80	1.10	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	1.10	.00	.00
27	.00	.00	.00	.00	.00	1.25	.00	.00	.00
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33	.00	.00	.00	.00	.00	.00	.00	.00	.00
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36	.00	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	1.50	.00	.00	1.30	.00	.00
52	.00	.00	.20	.00	.00	1.15	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.90	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00	.00



67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	1.10	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.85	.00	.00	1.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.85	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.10	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

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3	1.50	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	1.50	.00	.00	.00	.00	.00	.00	.00
6	1.50	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.80	.00	.00	.00	.00	.00	.00	.00
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15	.00	.00	.00	.00	.00	.00	.00	.00
16	.80	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	1.50	1.50
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23	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	1.05	1.15	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	1.50	1.80	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	1.20	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.75	.00	.00
39	1.25	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00	.00
45	1.25	.00	.00	.00	.00	.00	1.25	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00	.00
47	1.50	.00	.00	.00	.00	.00	.00	.00	.00
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49	.00	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	1.50	.00	.00	.00
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52	.00	.00	.00	.00	.00	1.15	.70	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00	.00
78	1.15	.00	.00	.00	.00	.00	.00	.00	.00

79	.00	.00	.00	.00	.00	1.08	.80	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	1.20	.00	.00	1.20	.00
88	1.50	.00	.00	.00	.00	1.15	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	41	42	43	44	45	46	47	48
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	1.25	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	2.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	1.25	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.75	.00	.00	1.25	.00
12	.00	.00	.00	.75	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.75	.75	.75
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.75	.75	.75
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	1.15	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	1.10	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	1.15	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	1.25	.00
33	.00	.00	.00	.00	.00	.00	.00	.00

34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	1.20	.00
40	.00	1.10	.00	.00	.00	1.10	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	1.15	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	.00
46	.00	1.25	.00	.00	.00	.00	1.25	1.50
47	.00	.00	1.10	.00	.00	.00	.00	1.50
48	.00	.00	.00	.00	.00	.00	1.10	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	1.25	.00
54	.00	1.25	.00	.00	.00	1.25	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	1.50	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
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62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	1.50	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	1.40	1.50	.00	.00	.00	1.50	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	1.10	1.25
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	1.10	1.15
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	1.20	.10	.00	.00	.00
87	.00	.00	.00	.00	.00	.75	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00

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91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	49	50	51	52	53	54	55	56
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	1.50	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	1.50	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	2.00	.00	.00	.00	.00
10	.00	.00	.00	1.15	.00	.00	.00	.00
11	.00	.00	.00	.00	1.25	.00	.00	.00
12	.00	1.25	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.75	.75	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.75	.75	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	1.15	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.01	.00	.00	1.15	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	2.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	1.10	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	1.10	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	1.25	.00	.00	.00	.00	.00	.00	.00

46	.00	.00	.00	.00	1.25	1.10	.00	.00
47	.00	.00	.00	.00	1.50	.00	.00	.00
48	.00	.00	.00	.00	1.25	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.80	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.20	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
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56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
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62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	1.20	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	1.15	.00	.00	.00
79	.00	.00	.00	1.20	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	1.10	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	1.15	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	1.20	.00
87	.00	.00	1.15	1.15	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

----- 57                      58                      59                      60                      61                      62                      63                      64



58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
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64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
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67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	1.10	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	1.50	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	65	66	67	68	69	70	71	72
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
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7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00



13	1.15	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	1.10	.00	.00	.00	.00	1.10	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	1.20	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	1.25	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	1.25	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	1.10	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.80	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	1.25	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
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67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00

70	.00	.00	.00	.00	.00	.00	.00	.00
71	1.25	.00	.00	.00	.00	1.35	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	1.50	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.75	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	1.30	.00	.00
83	.00	.00	.00	.00	.00	1.25	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	1.25	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
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95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	73	74	75	76	77	78	79	80
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
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5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	1.25	.00	2.00	.00
9	.00	.00	.00	.00	1.10	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
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14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	1.25	.00	2.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
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23	.00	.00	.00	.00	.00	.00	.00	.00
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26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.85	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
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35	.00	.00	.00	.00	.00	.00	.00	.00
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37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	1.10	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	1.50
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
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51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	1.15	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
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59	.00	.00	.00	.00	.00	.00	.00	.00
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61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	1.10	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	1.40	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	2.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	1.50	.00	.00	1.05
81	.00	.00	.00	.00	.00	.00	.00	.00

82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.75
87	.50	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	81	82	83	84	85	86	87	88
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	1.50	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.95	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.85	.85	.00	.85	1.25	.50	.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.50	.00
16	.00	.85	.85	.00	.25	1.15	.50	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
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27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	1.25	.00	.00	.00
29	.00	1.15	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	1.25	1.25	.00	1.25	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	1.20	1.20	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00

37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	1.25	1.25	.00	1.25	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	1.15	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.80	.00	.00	.00	.00	.10	1.50	.00
46	.00	1.25	1.10	1.10	1.10	.00	.00	.00
47	.00	1.50	.00	.00	.00	.00	.00	.00
48	.00	1.10	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	1.10	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	1.10	.00	.00	1.10	.00	.00	.00
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53	.00	2.00	1.25	.00	1.05	.00	.00	.00
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63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
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67	.00	.00	.00	.00	.00	.00	.00	.00
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69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	1.10	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.75
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	1.25	1.75	.00	.00	.00	.00
83	.00	.00	.00	.00	1.15	.00	.00	.00
84	.00	1.25	.00	.00	.00	.00	.00	.00
85	.00	.00	1.15	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.10	.00
87	.00	.00	.00	.00	.90	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.90	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00

94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

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	89	90	91	92	93	94	95	96
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1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.10	.10	.00	.00	.00	.80	.00	2.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.90	.90	.00	.00	.00	.00	.00	.00
16	.10	.10	.00	.00	.00	.80	.00	2.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.10	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.10	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	1.50	1.50	.00	.00	.00	.00	1.70	.00
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00

49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.10	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	1.75	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.10	.10	.00	.00	.00	.00	.00	1.25
87	2.00	2.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	1.70	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

-----	97	98	99
1	.00	.00	.00
2	.00	.00	.00
3	.00	.00	.00
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10	.00	.00	.00
11	.00	.00	.00
12	.00	.00	.00
13	2.00	.00	2.00
14	.00	.00	.00
15	.00	.00	.00
16	2.00	.00	2.00
17	.00	.00	.00
18	.00	.00	.00
19	.00	.00	.00
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23	.00	.00	.00
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31	.00	.00	.00
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34	.00	.00	.00
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37	.00	.00	.00
38	.00	.00	.00
39	.00	.00	.00
40	.00	.00	.00
41	.00	.00	.00
42	.00	.00	.00
43	.00	.00	.00
44	.00	.00	.00
45	.00	.20	.00
46	.00	.00	.00
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64	.00	.00	.00
65	.00	.00	.00
66	.00	.00	.00
67	.00	.00	.00
68	.00	.00	.00
69	.00	.00	.00
70	.00	.00	.00
71	.00	.00	.00
72	.00	.00	.00
73	.00	.00	.00
74	.00	.00	.00
75	.00	.00	.00
76	.00	.00	.00
77	.00	.00	.00
78	.00	.00	.00
79	.00	.00	.00
80	.00	.00	.00
81	.00	.00	.00
82	.00	.00	.00
83	.00	.00	.00
84	.00	.00	.00
85	.00	.00	.00
86	.00	.00	.00
87	.00	.50	.00
88	.00	.00	.00
89	.00	.00	.00
90	.00	.00	.00
91	.00	.00	.00
92	.00	1.10	.00
93	.00	.00	.00
94	.00	.00	.00
95	.00	.00	.00
96	.00	.00	.00
97	.00	.00	.00
98	.00	.00	.00
99	.00	.00	.00

DETAILED LISTING:  
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EV	ON	EV	BASIS	MAX IMP	SS IMP	TIME: TO	FIRST IMP	MAX IMP	END IMP	SS IMP
3		5	E	1.200	1.000		2	7	10	15
3		6	E	1.100	1.000		5	10	15	20
3		33	B	1.500	1.000		3	5	15	20
3		43	B	1.250	1.250		4	4	4	4
3		53	E	1.500	1.000		3	5	15	20
3		83	B	1.500	1.200		2	6	10	14
-----										
5		3	E	1.100	1.000		1	5	10	12
5		6	E	1.100	1.000		1	5	10	12

5	33	B	1.500	1.500	1	3	3	3
5	47	E	2.000	2.000	1	5	5	5
-----								
6	3	B	1.250	1.000	2	4	14	17
6	12	E	1.100	1.000	1	3	6	7
6	14	B	1.050	1.050	2	4	4	4
6	33	B	1.500	1.000	3	5	15	20
6	53	B	1.500	1.100	3	5	15	20
-----								
8	9	B	.800	1.000	1	4	10	15
8	13	B	1.250	1.000	1	2	4	6
8	27	B	1.100	1.000	3	5	5	10
8	47	B	1.250	1.000	1	5	10	15
8	52	B	2.000	1.000	1	1	2	3
8	77	B	1.200	1.000	1	2	4	6
8	79	B	2.000	1.000	1	2	4	10
-----								
9	52	B	1.150	1.000	1	1	2	3
9	77	E	1.100	1.000	1	3	5	7
9	87	B	.950	1.000	1	3	5	7
-----								
10	26	B	1.200	1.000	3	5	7	8
10	44	E	.750	1.000	1	1	3	5
10	47	B	1.250	1.250	1	3	3	3
10	53	B	1.250	1.250	1	3	3	3
-----								
11	12	B	1.800	1.000	1	1	1	4
11	14	E	1.250	1.000	1	1	3	7
11	38	B	.750	1.000	1	1	3	7
11	43	B	.750	1.000	1	1	3	7
11	44	B	.750	1.000	1	1	3	7
-----								
12	50	B	1.250	1.000	2	4	8	10
-----								
13	2	B	1.250	1.000	2	4	24	30
13	3	B	.750	1.000	1	1	5	7
13	8	E	1.050	1.000	1	2	5	6
13	11	E	1.250	1.000	1	1	5	7
13	14	B	1.250	1.000	1	1	5	7
13	16	E	1.200	1.000	1	1	5	7
13	22	E	1.250	1.000	1	1	5	7
13	26	B	.800	1.000	1	1	5	5
13	27	B	.800	1.000	1	1	5	6

13	30	B	.750	1.000	1	1	5	10
13	33	B	.800	1.000	1	1	5	7
13	39	B	1.500	1.000	2	4	6	8
13	40	B	1.500	1.000	1	1	5	7
13	46	B	.750	1.000	1	1	5	7
13	47	B	.750	1.000	1	1	5	7
13	48	B	.750	1.000	1	1	5	7
13	53	B	.750	1.000	1	1	5	7
13	54	B	.750	1.000	1	1	5	7
13	65	B	1.150	1.000	1	1	5	7
13	82	B	.850	1.000	1	1	5	7
13	83	B	.850	1.000	1	1	5	7
13	85	B	.850	1.000	1	1	5	7
13	86	B	1.250	1.000	1	2	4	7
13	87	B	.500	1.000	1	1	4	6
13	89	B	.100	1.000	1	1	4	5
13	90	B	.100	1.000	1	1	4	5
13	94	B	.800	1.000	1	1	4	6
13	96	B	2.000	1.000	1	1	4	5
13	97	B	2.000	1.000	1	1	4	5
13	99	B	2.000	1.000	1	1	4	5

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15	13	B	1.100	1.050	1	1	2	3
15	87	B	.500	1.000	1	1	2	3
15	89	B	.900	1.000	1	1	1	2
15	90	B	.900	1.000	1	1	1	2

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16	2	B	1.250	1.000	2	4	24	30
16	3	B	.750	1.000	1	1	4	6
16	13	B	1.200	1.000	1	1	4	6
16	14	B	1.250	1.000	1	1	4	6
16	22	B	1.250	1.000	1	1	4	6
16	26	B	.800	1.000	1	1	4	4
16	27	B	1.100	1.000	2	4	4	8
16	33	B	.800	1.000	1	1	4	6
16	39	B	1.500	1.000	2	4	6	8
16	40	B	1.500	1.000	1	1	4	6
16	46	B	.750	1.000	1	1	4	6
16	47	B	.750	1.000	1	1	4	6
16	48	B	.750	1.000	1	1	4	6
16	53	B	.750	1.000	1	1	4	6
16	54	B	.750	1.000	1	1	4	6
16	77	B	1.250	1.000	2	2	5	7
16	79	B	2.000	1.000	2	2	5	7
16	82	B	.850	1.000	1	1	4	6
16	83	B	.850	1.000	1	1	4	6
16	85	B	.850	1.000	1	1	4	6
16	86	B	1.150	1.000	1	2	3	6
16	87	B	.500	1.000	1	1	3	5
16	89	B	.100	1.000	1	1	3	4
16	90	B	.100	1.000	1	1	3	4
16	94	B	.800	1.000	1	1	3	5
16	96	B	2.000	1.000	1	1	3	4

16	97	B	2.000	1.000	1	1	3	4
16	59	B	2.000	1.000	1	1	3	4
-----								
18	10	E	1.250	1.250	1	3	3	3
18	39	B	1.250	1.250	1	3	3	3
18	44	B	1.150	1.150	1	3	3	3
-----								
26	31	B	1.100	1.100	2	4	8	8
26	47	B	1.100	1.100	2	6	6	6
26	82	B	1.100	1.100	2	6	6	6
26	83	E	1.250	1.250	2	4	4	4
26	85	B	1.250	1.250	2	4	4	4
26	94	E	.100	.100	1	1	1	1
-----								
27	13	E	.750	1.000	2	4	12	20
27	15	B	.850	1.000	2	4	12	20
27	16	E	.700	1.000	2	4	12	20
27	30	E	1.250	1.000	2	4	12	20
27	37	B	1.050	1.000	2	4	12	20
27	38	E	1.150	1.000	1	5	5	10
27	50	E	1.150	1.000	1	5	5	10
27	52	B	.800	1.000	1	2	4	5
27	79	B	.850	1.000	1	2	4	5
-----								
28	14	E	1.150	1.150	1	3	3	3
28	19	B	1.250	1.000	1	3	8	12
28	85	B	1.250	1.250	1	3	3	3
-----								
29	3	B	1.150	1.000	2	4	8	10
29	47	E	1.150	1.150	2	6	6	6
29	53	B	1.150	1.000	2	4	8	10
29	82	B	1.150	1.150	2	6	6	6
-----								
30	11	E	.800	1.000	1	1	1	10
30	13	B	1.200	1.000	2	4	7	10
30	37	E	1.500	1.000	1	3	8	12
30	38	E	1.800	1.000	1	1	1	5
30	50	B	.010	.010	1	1	1	1
-----								
31	14	E	1.100	1.100	1	1	1	1
31	26	E	1.300	1.000	1	1	1	8
31	47	B	1.250	1.100	2	6	16	21
31	82	B	1.250	1.100	2	6	16	21

31	83	B	1.250	1.100	2	6	16	21
31	85	B	1.250	1.100	2	6	16	21
31	94	E	.100	.100	1	1	1	1

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33	5	B	1.050	1.050	1	4	4	4
33	47	B	1.200	1.100	2	6	16	21
33	82	B	1.200	1.100	2	6	16	21
33	83	B	1.200	1.100	2	6	16	21

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35	49	E	2.000	2.000	1	1	1	1
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37	38	E	1.200	1.000	1	1	1	5
37	50	E	1.100	1.100	1	1	1	1

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38	11	B	.750	.750	1	1	1	1
38	39	E	.750	1.000	1	1	1	10

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39	33	B	1.250	1.250	2	2	2	2
39	47	B	1.200	1.100	2	6	12	20
39	82	B	1.250	1.100	2	6	12	20
39	83	B	1.250	1.100	2	6	12	20
39	85	B	1.250	1.100	2	6	12	20

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40	19	E	1.100	1.000	2	5	7	10
40	42	E	1.100	1.000	2	5	7	10
40	46	E	1.100	1.000	2	5	7	10
40	54	E	1.100	1.000	2	5	7	10
40	65	E	1.100	1.000	2	5	7	10
40	70	E	1.100	1.000	2	5	7	10
40	73	E	1.100	1.000	2	5	7	10

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42	65	E	1.200	1.100	1	5	9	13
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43	3	B	1.150	1.000	1	3	5	10
43	47	B	1.150	1.000	1	4	10	15
43	82	B	1.150	1.000	1	4	10	15

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44	10	E	.750	1.000	1	1	3	5
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45	2	E	.750	1.000	1	1	5	7
45	9	E	1.250	1.000	1	1	5	7
45	10	E	1.200	1.000	2	4	6	8
45	33	B	1.250	1.000	1	1	5	7
45	39	E	1.250	1.000	1	3	5	7
45	49	E	1.250	1.000	1	1	5	7
45	55	E	.500	1.000	1	1	5	7
45	66	E	1.250	1.000	1	1	5	7
45	80	E	1.500	1.000	1	2	4	6
45	81	E	.800	1.000	1	1	5	7
45	86	E	.100	1.000	2	5	7	11
45	87	B	1.500	1.000	2	5	7	11
45	89	B	1.500	1.000	2	5	7	11
45	90	B	1.500	1.000	2	5	7	11
45	95	B	1.700	1.000	1	2	2	2
45	98	B	.200	1.000	2	3	7	9

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46	3	B	1.250	1.000	1	3	7	12
46	42	B	1.250	1.000	1	3	7	12
46	47	B	1.250	1.250	2	6	6	6
46	48	E	1.500	1.000	1	3	7	12
46	53	B	1.250	1.000	1	3	7	12
46	54	E	1.100	1.000	1	3	7	12
46	70	B	1.250	1.000	1	3	7	12
46	82	B	1.250	1.250	2	6	6	6
46	83	B	1.100	1.100	2	6	6	6
46	84	B	1.100	1.100	2	6	6	6
46	85	B	1.100	1.100	2	6	6	6

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47	3	B	1.500	1.500	2	6	6	6
47	5	E	1.500	1.100	2	6	10	15
47	6	E	1.500	1.100	2	6	10	15
47	33	B	1.500	1.100	2	6	10	15
47	43	B	1.100	1.100	10	14	14	14
47	48	B	1.500	1.500	?	6	6	6
47	52	E	1.500	1.500	2	6	6	6
47	82	B	1.500	1.500	2	6	6	6

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48	3	B	1.300	1.000	1	3	7	12
48	47	B	1.100	1.000	2	6	10	15
48	53	B	1.250	1.000	1	3	7	12
48	82	B	1.100	1.000	2	6	10	15

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49	9	B	1.100	1.000	2	2	2	4
49	66	B	1.100	1.000	2	2	2	4
49	85	B	1.100	1.000	1	2	6	10

50	12	B	1.200	1.000	2	2	2	6
50	38	B	1.500	1.000	1	3	5	8
50	95	E	.100	.100	1	1	1	1
-----								
51	28	B	1.500	1.500	1	1	1	1
51	31	B	1.300	1.000	1	1	1	5
51	40	B	1.150	1.000	1	1	1	6
51	62	B	1.100	1.100	1	3	3	3
51	85	B	1.100	1.100	1	3	3	3
-----								
52	9	B	.800	1.000	1	1	2	3
52	14	B	.800	1.000	1	1	2	3
52	27	B	.200	1.000	1	1	3	6
52	30	B	1.150	1.000	1	1	2	3
52	38	B	1.150	1.000	1	1	2	3
52	39	B	.700	1.000	1	1	2	3
52	49	B	.800	1.000	1	1	1	3
52	66	B	.800	1.000	1	1	2	3
52	77	B	1.150	1.000	1	1	2	3
-----								
53	3	E	1.250	1.000	1	3	7	10
53	5	B	1.150	1.000	2	4	8	11
53	6	B	1.150	1.000	2	4	8	11
53	47	B	1.250	1.250	2	6	6	6
53	62	B	2.000	2.000	2	6	6	6
53	63	B	1.250	1.250	2	6	6	6
53	65	B	1.050	1.050	2	6	6	6
-----								
54	42	B	1.250	1.000	2	4	8	12
54	46	B	1.250	1.000	2	4	8	12
54	65	B	1.250	1.000	2	4	8	12
-----								
55	3	B	1.200	1.000	2	4	8	12
-----								
57	41	E	1.500	1.500	1	2	2	2
-----								
58	13	B	1.250	1.000	1	1	2	4
58	15	B	1.750	1.000	1	1	2	3
58	27	B	.900	1.000	1	1	3	5
-----								

62	78	B	1.100	1.000	5	10	15	22
62	88	E	.800	.800	2	5	5	5
-----								
63	13	E	.900	1.000	1	3	7	10
63	15	E	.700	1.000	1	3	4	7
63	35	E	.600	1.000	1	3	5	7
-----								
64	3	B	1.200	1.000	1	3	7	10
64	53	B	1.200	1.000	1	3	7	10
-----								
70	85	B	1.100	1.100	1	3	3	3
-----								
71	46	B	1.500	1.500	2	4	4	4
71	65	B	1.250	1.000	4	8	11	14
71	70	B	1.350	1.350	2	4	4	4
71	73	B	1.400	1.000	5	9	14	18
71	92	B	1.750	1.750	2	4	4	4
-----								
73	41	B	1.400	1.400	3	5	5	5
73	42	B	1.500	1.500	1	3	3	3
73	46	B	1.500	1.500	2	4	4	4
73	57	B	1.100	1.000	5	10	20	40
73	65	B	1.500	1.000	2	4	6	10
-----								
75	27	E	1.100	1.000	1	1	1	10
75	52	E	.600	1.000	1	1	1	5
75	79	E	2.000	1.000	1	1	1	5
-----								
78	3	E	1.150	1.150	2	4	4	4
78	33	B	1.150	1.150	2	4	4	4
78	53	B	1.150	1.150	2	4	4	4
78	88	B	.750	.750	2	12	12	12
-----								
79	2	B	.800	1.000	1	1	1	3
79	11	B	.900	1.000	1	1	1	3
79	13	E	.950	1.000	1	1	1	3
79	15	E	.850	1.000	1	1	1	3
79	16	E	.750	1.000	1	1	1	3
79	27	E	.850	1.000	1	1	1	3
79	30	E	1.080	1.000	1	1	1	3



79	38	E	1.080	1.000	1	1	1	3
79	39	B	.800	1.000	1	1	1	3
79	52	B	1.200	1.000	1	1	1	3
79	58	B	.800	1.000	1	1	1	3
79	66	B	.750	1.000	1	1	1	3
79	77	E	1.500	1.000	1	1	1	3
79	80	B	1.050	1.000	1	1	1	3
-----								
80	9	B	1.500	1.000	1	2	3	4
80	11	B	1.100	1.000	1	2	3	4
-----								
81	2	E	.750	.750	1	2	2	2
-----								
82	3	E	1.100	1.100	2	6	6	6
82	47	E	1.100	1.100	2	8	8	8
82	48	E	1.250	1.250	2	4	4	4
82	53	E	1.100	1.100	2	6	6	6
82	70	B	1.300	1.300	1	3	3	3
82	83	B	1.250	1.250	1	3	3	3
82	84	B	1.750	1.750	2	6	6	6
-----								
83	70	B	1.250	1.000	2	6	8	10
83	85	E	1.150	1.000	2	6	8	10
-----								
84	3	B	1.150	1.150	2	6	6	6
84	5	B	1.100	1.000	2	6	10	15
84	47	B	1.100	1.000	2	6	10	15
84	48	B	1.150	1.000	2	6	10	15
84	53	B	1.150	1.150	2	6	6	6
84	82	B	1.250	1.250	2	6	6	6
-----								
85	70	B	1.250	1.000	2	6	8	10
85	83	E	1.150	1.000	2	6	8	10
-----								
86	2	B	1.200	1.000	2	5	10	20
86	9	B	.750	1.000	1	4	6	10
86	10	B	.900	1.000	2	5	7	11
86	14	B	1.200	1.000	2	5	7	11
86	26	E	.850	1.000	2	5	7	11
86	36	B	1.200	1.000	2	5	7	11
86	39	B	1.200	1.000	2	5	7	11
86	44	B	1.200	1.000	2	5	7	11
86	45	B	.100	1.000	2	5	7	11

86	55	B	1.200	1.000	2	5	7	11
86	60	B	.750	1.000	1	4	6	10
86	67	B	.100	1.000	2	5	7	11
86	69	B	.100	1.000	2	5	7	11
86	90	B	.100	1.000	2	5	7	11
86	96	B	1.250	1.000	2	5	7	11

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87	2	B	.750	1.000	1	3	5	7
87	19	B	.750	1.000	1	3	5	7
87	38	B	1.150	1.000	1	3	5	7
87	46	B	.750	1.000	1	3	5	7
87	51	B	1.150	1.000	2	5	7	11
87	52	B	1.150	1.000	1	3	5	7
87	73	B	.500	1.000	1	3	5	7
87	65	B	.900	1.000	2	5	7	11
87	69	B	2.000	1.000	1	3	5	7
87	90	B	2.000	1.000	1	3	5	7
87	98	B	.500	1.000	1	3	5	7

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88	33	B	1.500	1.500	2	4	4	4
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89	65	B	.900	1.000	2	5	7	11
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91	58	B	1.500	1.000	1	2	4	8
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92	98	B	1.100	1.000	2	4	8	12
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94	26	B	.100	.100	1	1	1	1
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95	94	B	1.700	1.700	1	2	2	2
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CROSS IMPACTS OF EVENTS ON TRENDS:

CROSS IMPACT MATRIX:

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1            2            3            4            5            6            7            8

1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.90	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	1.15	.00	.00	.00	.00	.00	.00	.95
11	.00	.00	.00	.00	1.09	.00	.00	1.09
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.30	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	1.05	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	1.10	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	1.20	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.05	.00	.00	.05	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.10	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	1.05	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	1.20	.00	.00	.00	.00	.00	.00
43	.95	.00	.00	.00	.00	.00	.00	.00
44	1.15	.00	.00	.00	.00	.00	.00	.95
45	.60	.00	.00	.00	.00	.00	.00	.00
46	.00	1.02	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	1.10	.00	.00	.00	.61	.61	.00	.61
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.75	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00

57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.75	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	1.35	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	1.25	.00	.00	.95	.00	.00	.95
74	1.05	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	1.10	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	1.02	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.95	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	1.25	.00	.00	.00	.00	.00	.00	.00
87	1.25	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	1.20	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	9	10	11	12	13	14	15	16
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.97	.97	.00	.00	.00	1.10
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	1.05	.00	.95
10	.95	.90	.00	.00	1.59	.00	.00	.00
11	1.09	1.09	.00	.00	.00	1.09	1.09	.00

12	.00	.00	.00	.00	.00	.00	.00	1.05
13	.00	.00	.00	.00	.00	.00	.00	2.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	1.50
16	.00	.00	.00	.00	.00	.00	.00	2.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	1.10
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	1.20
29	.00	.00	.95	.95	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	1.05
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.90	.00	.00	.00	.90	1.15	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	1.10
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	1.35
50	.00	.00	.00	.00	.00	.00	.00	.95
51	.61	.61	.00	.00	.00	.61	.61	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	1.15
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.90	.90	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	1.08
64	.00	.00	1.10	1.10	.00	1.05	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.95
66	.00	.00	.00	.00	.00	.00	.00	.95
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00

69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.95	.00	1.10
71	.00	.00	.20	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.95	.95	.96	.96	.00	.96	.95	1.15
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	1.15
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	1.02	.00	1.05
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	1.15	.00	.00	.00
87	.00	.00	.00	.00	1.05	.95	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.80
90	.00	.00	.00	.00	.00	.00	.00	.80
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	17	18	19	20	21	22	23	24
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.75	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00

24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	1.10	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	1.05	1.05	.00	.00
43	.00	.00	.00	.00	.00	1.20	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.61	.61	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	1.25	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	1.10	.00	.00	.00	.00	.00
71	.00	.00	1.20	.00	1.10	1.10	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	1.10	.95	1.10	1.10	.00	.00
74	.00	.00	1.05	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00

81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.75	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	25	26	27	28	29	30	31	32
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.97	.97	.97	.00	.97	.97	1.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	1.05
10	.00	.00	.95	.95	.00	.95	.00	.00
11	.00	.00	1.04	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	1.25
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	1.05
16	.00	.00	.00	.00	.00	.00	.00	1.25
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	1.25
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	1.20
28	.00	.00	.00	.00	.00	.00	.00	1.25
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00



36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.95	.00	.00	.00
38	.00	.00	.00	.00	.95	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00	.00
46	.00	.95	.95	.95	.00	.95	.95	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.61	.61	.61	.00	.61	.61	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	1.10	1.10	1.10	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	1.05
66	.00	.00	.00	.00	.00	.00	.00	1.05
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	1.15
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	.00	.00	.00	.00	.00	.00	2.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.85
91	.00	.00	.00	.00	.00	.00	.00	.85
92	.00	.00	.00	.00	.00	.00	.00	.00

	93	94	95	96	97	98	99	33	34	35	36	37	38	39	40
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
1	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
3	1.10	.00	.00	.00	.97	1.03	.00						.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
5	1.05	.00	.00	.00	.00	.00	.00						.00	.00	.00
6	1.20	.00	.00	.00	.00	.00	.00						.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
10	.00	.95	.00	.00	.00	.00	.00					1.25	1.25	.00	1.25
11	.00	1.02	1.02	.00	.00	.00	.00						.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
13	1.50	.00	.00	.00	.00	.00	.00						.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
16	.80	.00	.00	.00	.00	.00	.00						.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
26	1.03	.00	.00	.00	.00	.00	.00						.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
29	1.20	.00	.00	.00	.00	.00	.00						.00	.00	.00
30	.00	.80	.00	.00	.00	.00	.00						.00	.00	.00
31	1.05	.00	.00	.00	.00	.00	.00						.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
45	.00	.00	.00	.00	.00	.00	.00						.00	.00	.00
46	.00	.00	.00	.00	.95	1.05	.00						.00	.00	.00
47	1.10	.00	.00	.00	.00	.00	.00						.00	.00	.00

48	.00	.00	.00	1.05	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.61	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	1.25	.00	.00	.00	.00
54	.00	.00	.00	2.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	1.02	.00	.00	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	1.10	1.05	.00	.00	.00	.00
65	1.20	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	1.10	.00	.00	.00	.00	.00	.00	.00
71	1.15	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	1.10	.00	.00	.00	.00	.00	.00	.00
83	1.05	.00	.00	.00	.00	.00	.00	.00
84	1.05	1.02	1.02	1.05	.00	.00	.00	.00
85	1.05	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.95	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

-----								
	41	42	43	44	45	46	47	48
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00

3	.00	.00	.00	.00	.00	.00	.97	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.90	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	1.25	1.25	.00	.00	.00	.00	.91	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	1.10	1.25	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	1.20	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.00	.00	.00	.00	.95	.00	.00
46	.00	.00	.00	.00	.00	.00	.95	.00
47	.00	.00	.00	.00	.00	.00	1.10	.00
48	.00	.00	.00	.00	.00	.00	.95	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.00	.00	.00	.00	.00	.00	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00

60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	.00	.00	.00	.00	.95	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.90	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.90	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.90	.00
83	.00	.00	.00	.00	.00	.00	.95	.00
84	.00	.00	.00	.00	.00	.00	.95	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.75	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	49	50	51	52	53	54	55	56
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	1.05	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.95	.00	.95	.00
11	.00	1.02	.00	1.11	1.12	.00	1.01	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00

15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.93	.00	.00	.93	.00
29	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	1.10	.00	.00	.00	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	.00	.00	.00	.00	.00	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.00	.90	.00	.00	.00	.00	.00	.00
46	.00	.00	.00	.00	.00	.00	.00	.00
47	.00	.00	.00	.00	.00	.00	.00	.00
48	.00	.00	.00	.00	.00	.00	.00	.00
49	.00	.00	.00	.00	.00	.00	.00	.00
50	.00	.00	.00	.00	.00	.00	.00	.00
51	.00	.61	.00	.61	.61	.00	.61	.00
52	.00	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	.00	.00	.00	.00	.00	.00
54	.00	.00	.00	.00	.00	.00	.00	.00
55	.00	.00	.90	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	.00	.00	.00	.00	.00	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	1.20	.00	.00	.00	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	.00	.00	.00	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	.00	.00	.00	.00	.00	.00
71	.00	.00	.00	.00	.00	.00	.00	.00

72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	.00	.00	.00	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	1.10	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	.00	.00	.00	.00	.00	.00
83	.00	.00	.00	.00	.00	.00	.00	.00
84	.00	1.02	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.80	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	57	58	59	60	61	62	63	64
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2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00





84	.00	.00	.00	.00	.00	.00	.00	.00
85	.00	.00	.00	.00	.00	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.00	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00
-----								
	65	66	67	68	69	70	71	72
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	1.10	.00	.00	.00	.00	.00	.00
3	.00	.89	1.15	1.05	1.05	1.05	1.30	.00
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	1.30	.00
6	.00	1.05	1.10	.00	.00	1.05	1.30	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.75	.00	1.05	.00	1.15	.00	.80
9	.00	1.20	.00	.00	1.05	1.05	.00	.00
10	.00	.90	.00	.00	.00	.00	.00	.00
11	.00	1.10	.00	.00	.00	.00	.00	1.25
12	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	1.20	1.40	.00	1.50	1.50	1.25	2.00
14	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	1.20	1.08	.00	1.50	1.50	.00	2.00
16	.00	.80	1.40	.00	1.50	1.50	.00	1.10
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	1.10	1.02	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	1.05	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	1.50	.00
30	.00	.90	.00	.00	.90	.00	.00	.00
31	.00	1.15	1.05	.00	.00	1.05	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	.00	1.10	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00	2.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.90	.00	.00	.90	.00	.00	.00
38	.00	.90	.00	.00	.90	.00	.00	.00

39	.00	.00	.00	.00	.00	.00	.00	.00
40	.00	1.05	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	.00	.00	.00	.00	.00
43	.00	1.05	.00	.00	.00	.00	.00	.00
44	.00	1.10	.00	.00	.00	.00	.00	.00
45	.00	1.20	.00	.00	.00	.00	.00	.85
46	.00	1.05	.00	.00	.00	.00	1.10	.00
47	.00	1.10	1.10	.00	1.10	1.05	1.05	.00
48	.00	1.05	1.05	1.05	1.05	1.05	1.03	.00
49	.00	1.05	.00	1.05	1.05	1.05	.00	1.05
50	.00	.95	.00	.00	.00	.00	.00	.90
51	.00	.90	.00	.00	.00	.00	.00	1.05
52	.00	.90	.00	.00	.00	.00	.00	.90
53	.00	1.10	1.10	1.05	1.10	1.05	1.10	.00
54	.00	1.50	.00	.00	.00	.00	.00	.00
55	.00	.98	.00	.00	.00	.00	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	.00	1.05	.00	.00	1.10	.00	.00	1.10
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	.00	1.15	.00	.00	.00	1.10	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.90	.00	.00	.00	.00	.00	.20
65	.00	1.10	1.10	.00	.00	.00	1.20	.00
66	.00	.00	.00	.00	1.05	1.05	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	1.02	1.20	.00	1.03	1.03	1.03	.00
71	.00	.00	.00	.00	.00	.00	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	1.50	1.05	.00	.00	.00	1.10	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.90	.00	.00	.00	.00	.00	.00
80	.00	.98	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	1.10	1.10	1.05	.00	.00	1.10	.00
83	.00	1.50	1.25	1.05	1.25	1.15	1.10	.00
84	.00	1.25	1.10	.00	.00	1.05	.00	.00
85	.00	1.10	1.05	.00	1.50	.00	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.98	.00	.00	.00	.00
94	.00	.00	.00	.00	.00	.80	.00	.00
95	.00	.00	.00	.00	.00	.00	.00	.00

96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	73	74	75	76	77	78	79	80
1	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	1.25	1.25	.00	1.15	.00	1.10
4	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	.80	.00	.00	.00	.00	.00	.00	.00
9	1.10	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	1.30	.00	.00	.00	.00
11	1.25	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00
13	2.00	1.40	1.25	1.25	.00	1.40	.00	1.25
14	.00	.00	.00	.00	.00	.00	.00	.00
15	2.00	1.08	1.05	1.25	.00	1.08	.00	1.25
16	1.10	1.10	1.25	1.20	.00	.80	.00	1.25
17	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	1.02	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	1.05	1.05	.00	.00	.00	.00
29	.00	1.20	1.50	1.50	.00	1.20	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	1.25	.00	1.05	.00	.00
32	.00	.00	.00	.00	.00	.00	.00	.00
33	.00	.00	.00	.00	.00	1.02	.00	.00
34	.00	.00	.00	.00	.00	.00	.00	.00
35	2.00	.00	.00	.00	.00	.00	.00	.00
36	.00	.00	.00	.00	.00	.00	.00	.00
37	.00	.00	.00	.00	.00	.00	.00	.00
38	.00	.00	.00	.00	.00	.00	.00	.00
39	.00	.00	.00	.00	.00	1.10	.00	.00
40	.00	.00	.00	.00	.00	.00	.00	.00
41	.00	.00	.00	.00	.00	.00	.00	.00
42	.00	.00	.00	1.20	.00	.00	.00	1.05
43	.00	.00	.00	.00	.00	1.05	.00	.00
44	.00	.00	.00	.00	.00	.00	.00	.00
45	.85	.00	.00	.00	.00	.00	.00	.00
46	.00	.00	1.05	1.05	.00	1.05	.00	1.05
47	.00	.00	1.10	1.10	.00	1.10	.00	1.10
48	.00	.00	1.05	1.05	.00	1.11	.00	.00
49	1.05	.00	1.05	.00	.00	1.15	.00	.00
50	.00	.00	.00	.00	.00	.95	.00	.00

51	1.05	.00	.00	1.50	.00	.00	.00	.00
52	.90	.00	.00	.00	.00	.00	.00	.00
53	.00	.00	1.10	1.10	.00	1.10	.00	1.10
54	.00	.00	.00	.00	.00	1.10	.00	.00
55	.00	.00	.00	.00	.00	.97	.00	.00
56	.00	.00	.00	.00	.00	.00	.00	.00
57	.00	.00	.00	.00	.00	.00	.00	.00
58	1.20	.00	1.10	.00	.00	1.05	.00	.00
59	.00	.00	.00	.00	.00	.00	.00	.00
60	.00	.00	.00	.00	.00	.00	.00	.00
61	.00	.00	.00	.00	.00	.00	.00	.00
62	.00	1.20	.00	.00	.00	1.20	.00	.00
63	.00	.00	.00	.00	.00	.00	.00	.00
64	.00	.00	.00	.00	.00	.00	.00	.00
65	.00	.00	.00	1.30	.00	1.05	.00	.00
66	.00	.00	.00	.00	.00	.00	.00	.00
67	.00	.00	.00	.00	.00	.00	.00	.00
68	.00	.00	.00	.00	.00	.00	.00	.00
69	.00	.00	.00	.00	.00	.00	.00	.00
70	.00	.00	1.03	1.03	.00	1.05	.00	1.03
71	.00	1.20	.00	.00	.00	1.30	.00	.00
72	.00	.00	.00	.00	.00	.00	.00	.00
73	.00	.00	.00	1.10	.00	1.15	.00	.00
74	.00	.00	.00	.00	.00	.00	.00	.00
75	.00	.00	.00	.00	.00	.00	.00	.00
76	.00	.00	.00	.00	.00	.00	.00	.00
77	.00	.00	.00	.00	.00	.00	.00	.00
78	.00	.00	.00	.00	.00	.00	.00	.00
79	.00	.00	.00	.00	.00	.00	.00	.00
80	.00	.00	.00	.00	.00	.00	.00	.00
81	.00	.00	.00	.00	.00	.00	.00	.00
82	.00	.00	1.10	1.10	.00	1.10	.00	1.10
83	.00	.00	1.10	1.10	.00	1.05	.00	1.10
84	.00	.00	1.05	1.10	.00	1.05	.00	1.05
85	.00	.00	1.10	.00	.00	1.05	.00	.00
86	.00	.00	.00	.00	.00	.00	.00	.00
87	.00	.00	.00	.00	.00	.00	.00	.00
88	.00	.00	.00	.00	.00	.00	.00	.00
89	.00	.00	.00	.00	.00	.00	.00	.00
90	.00	.00	.00	.00	.00	.00	.00	.00
91	.00	.00	.00	.00	.00	.00	.00	.00
92	.00	.00	.00	.00	.00	.00	.00	.00
93	.00	.00	.00	.00	.00	.00	.00	.00
94	.00	.00	.00	.80	.00	.80	.00	.00
95	.00	.00	.00	.95	.00	.00	.00	.00
96	.00	.00	.00	.00	.00	.00	.00	.00
97	.00	.00	.00	.00	.00	.00	.00	.00
98	.00	.00	.00	.00	.00	.00	.00	.00
99	.00	.00	.00	.00	.00	.00	.00	.00

	81	82	83
1	.00	.00	.00
2	.00	.00	.00
3	1.50	.00	.00
4	.00	.00	.00
5	1.50	.00	.00
6	.00	.00	.00

7	.00	.00	.00
8	.00	.00	.00
9	.00	.00	.00
10	.00	.00	.00
11	.00	.00	.00
12	.00	.00	.00
13	1.10	.00	.00
14	.00	.00	.00
15	.00	.00	.00
16	1.10	.00	.00
17	.00	.00	.00
18	.00	.00	.00
19	.00	.00	.00
20	.00	.00	.00
21	.00	.00	.00
22	.00	.00	.00
23	.00	.00	.00
24	.00	.00	.00
25	.00	.00	.00
26	.00	.00	.00
27	.00	.00	.00
28	.00	.00	.00
29	1.50	.00	.00
30	.00	.00	.00
31	.00	.00	.00
32	.00	.00	.00
33	1.05	.00	.00
34	.00	.00	.00
35	.00	.00	.00
36	.00	.00	.00
37	.00	.00	.00
38	.00	.00	.00
39	1.10	.00	.00
40	.00	.00	.00
41	.00	.00	.00
42	1.20	.00	.00
43	1.15	.00	.00
44	.00	.00	.00
45	.00	.00	.00
46	1.10	.00	.00
47	1.10	.00	.00
48	1.50	.00	.00
49	.00	.00	.00
50	.00	.00	.00
51	.00	.00	.00
52	.00	.00	.00
53	1.25	.00	.00
54	2.00	.00	.00
55	.00	.00	.00
56	.00	.00	.00
57	1.05	.00	.00
58	.00	.00	.00
59	.00	.00	.00
60	.00	.00	.00
61	.00	.00	.00
62	.00	.00	.00
63	.00	.00	.00

64	1.10	.00	.00
65	.00	.00	.00
66	.00	.00	.00
67	.00	.00	.00
68	.00	.00	.00
69	.00	.00	.00
70	1.05	.00	.00
71	.00	.00	.00
72	.00	.00	.00
73	1.10	.00	.00
74	.00	.00	.00
75	.00	.00	.00
76	.00	.00	.00
77	.00	.00	.00
78	.00	.00	.00
79	.00	.00	.00
80	.00	.00	.00
81	.00	.00	.00
82	1.10	.00	.00
83	1.10	.00	.00
84	1.05	.00	.00
85	.00	.00	.00
86	.00	.00	.00
87	.00	.00	.00
88	.00	.00	.00
89	.00	.00	.00
90	.00	.00	.00
91	.00	.00	.00
92	.00	.00	.00
93	.00	.00	.00
94	.00	.00	.00
95	.00	.00	.00
96	.00	.00	.00
97	.00	.00	.00
98	.00	.00	.00
99	.00	.00	.00

DETAILED LISTING:

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EV	ON	TR	EASIS/ + CR *	MAX IMP	SS IMP	TIME: TO	FIRST IMP	MAX IMP	END IMP	SS IMP
2	66	E	*	1.100	1.000		0	0	0	3
-----										
3	7	E	*	.900	.900		2	4	4	4
3	11	E	*	.970	.970		1	3	3	3
3	12	E	*	.970	.970		1	3	3	3
3	16	E	*	1.100	1.100		3	3	3	3
3	26	E	*	.970	.970		1	3	3	3
3	27	E	*	.970	.970		1	3	3	3
3	28	E	*	.970	.970		1	3	3	3
3	30	E	*	.970	.970		1	3	3	3
3	31	E	*	.970	.970		3	3	3	3

3	32	B	*	1.030	1.030	1	3	3	3
3	33	E	*	1.100	1.100	1	3	3	3
3	35	E	*	.970	.970	1	3	3	3
3	36	B	*	1.030	1.030	1	3	3	3
3	47	B	*	.970	.970	2	4	4	4
3	66	E	*	.890	1.100	0	1	3	15
3	67	E	*	1.150	1.150	1	3	3	3
3	68	E	*	1.050	1.050	1	3	3	3
3	69	B	*	1.050	1.050	1	3	3	3
3	70	B	*	1.050	1.050	1	3	3	3
3	71	E	*	1.300	1.300	2	6	6	6
3	75	E	*	1.250	1.250	2	5	5	5
3	76	B	*	1.250	1.250	2	5	5	5
3	78	B	*	1.150	1.150	1	3	3	3
3	80	E	*	1.100	1.100	1	3	3	3
3	81	E	*	1.500	1.500	1	3	3	3
-----									
5	33	B	*	1.050	1.050	1	5	5	5
5	51	B	*	1.050	1.050	1	5	5	5
5	71	E	*	1.300	1.300	2	6	6	6
5	81	E	*	1.500	1.500	0	1	1	1
-----									
6	33	B	*	1.200	1.200	2	4	4	4
6	47	B	*	.900	.900	4	6	6	5
6	66	E	*	1.050	1.000	0	2	4	5
6	67	E	*	1.100	1.100	2	4	4	4
6	70	E	*	1.050	1.050	2	4	4	4
6	71	E	*	1.300	1.300	2	6	6	6
-----									
8	66	E	*	.750	1.000	0	0	0	2
8	68	E	*	1.050	1.000	2	4	8	12
8	70	E	*	1.150	1.000	2	4	8	12
8	72	B	*	.800	1.000	0	0	0	10
8	73	E	*	.800	1.000	0	0	0	10
-----									
9	14	B	*	1.050	1.050	0	2	2	2
9	16	B	*	.950	1.000	0	0	0	2
9	32	E	*	1.050	1.000	0	1	1	1
9	69	E	*	1.050	1.000	0	2	6	10
9	70	E	*	1.050	1.000	0	2	6	10
9	73	B	*	1.100	1.000	0	0	0	4
-----									
10	1	E	*	1.150	1.000	1	5	10	15
10	8	E	*	.950	1.000	1	5	8	10
10	9	E	*	.950	1.000	1	5	8	10
10	10	E	*	.900	1.000	1	5	8	10
10	13	B	*	1.500	1.500	0	10	10	10

10	27	E	*	.950	1.000	1	5	8	10
10	28	B	*	.950	1.000	1	5	8	10
10	30	B	*	.900	1.000	1	5	8	10
10	34	E	*	.950	1.000	1	5	8	10
10	37	E	*	1.250	1.250	0	10	10	10
10	38	B	*	1.250	1.250	0	10	10	10
10	40	B	*	1.250	1.250	0	10	10	10
10	41	E	*	1.250	1.250	0	10	10	10
10	42	E	*	1.250	1.250	0	10	10	10
10	53	B	*	.950	1.000	1	5	8	10
10	55	B	*	.950	1.000	1	5	8	10
10	66	B	*	.900	1.000	0	2	5	8
10	76	E	*	1.300	1.300	5	10	10	10

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11	5	B	*	1.090	1.000	0	1	5	6
11	8	B	*	1.090	1.000	0	1	5	6
11	9	E	*	1.090	1.000	0	1	5	6
11	10	E	*	1.090	1.000	0	1	5	6
11	14	B	*	1.090	1.000	0	1	5	6
11	15	B	*	1.090	1.000	0	1	5	6
11	27	E	*	1.040	1.000	0	1	5	6
11	34	E	*	1.020	1.000	0	1	5	6
11	35	E	*	1.020	1.000	0	1	5	6
11	47	B	*	.910	1.000	6	6	10	20
11	50	E	*	1.020	1.000	0	1	5	6
11	52	E	*	1.110	1.000	0	1	5	6
11	53	B	*	1.120	1.000	0	1	5	6
11	55	E	*	1.010	1.000	0	1	5	6
11	66	E	*	1.100	1.000	0	0	0	3
11	72	E	*	1.250	1.000	0	0	3	4
11	73	B	*	1.250	1.000	0	0	3	4

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12	16	E	*	1.050	1.050	1	4	4	4
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13	1	E	*	.300	1.000	0	0	4	4
13	16	E	*	2.000	1.000	1	2	6	8
13	32	E	*	1.250	1.000	0	0	4	4
13	33	E	*	1.500	1.000	1	2	6	8
13	66	E	*	1.200	1.000	0	1	5	8
13	67	E	*	1.400	1.000	0	2	6	8
13	69	E	*	1.500	1.000	0	0	4	6
13	70	E	*	1.500	1.000	5	0	4	6
13	71	E	*	1.250	1.000	0	2	4	6
13	72	E	*	2.000	1.000	0	0	4	5
13	73	E	*	2.000	1.000	0	0	4	6
13	74	E	*	1.400	1.000	0	0	4	6
13	75	E	*	1.250	1.000	0	2	4	6
13	76	E	*	1.250	1.000	0	2	4	6
13	78	E	*	1.400	1.000	0	0	4	6
13	80	B	*	1.250	1.000	0	1	5	7
13	81	E	*	1.100	1.000	0	1	5	6



14	4	E	*	1.050	1.050	0	2	2	2
15	16	B	*	1.500	1.000	1	1	2	4
15	32	E	*	1.050	1.000	0	0	1	1
15	66	B	**	1.200	1.000	0	0	1	3
15	67	B	*	1.080	1.000	0	0	1	3
15	69	B	*	1.500	1.000	0	0	1	3
15	70	E	*	1.500	1.000	0	0	1	3
15	72	B	*	2.000	1.000	0	0	1	3
15	73	B	*	2.000	1.000	0	0	1	3
15	74	E	*	1.080	1.000	0	0	1	3
15	75	E	*	1.050	1.000	0	0	1	3
15	76	B	*	1.250	1.000	0	0	1	3
15	78	B	*	1.080	1.000	0	0	1	3
15	80	E	*	1.250	1.000	0	0	1	3
16	1	B	*	1.100	1.000	1	1	4	4
16	16	B	*	2.000	1.000	1	2	5	7
16	19	E	*	.750	1.100	0	0	1	3
16	32	E	*	1.250	1.000	0	0	3	3
16	33	B	*	.800	1.000	0	0	1	3
16	46	B	*	1.100	1.000	2	4	8	10
16	47	E	*	1.250	1.000	0	0	1	4
16	66	E	*	.800	1.000	0	1	4	8
16	67	B	*	1.400	1.000	0	2	5	7
16	69	B	*	1.500	1.000	0	0	3	5
16	70	E	*	1.500	1.000	0	0	3	5
16	72	E	*	1.100	1.000	0	0	3	4
16	73	E	*	1.100	1.000	0	0	3	5
16	74	E	*	1.100	1.000	0	0	3	5
16	75	B	*	1.250	1.000	1	3	8	12
16	76	E	*	1.200	1.000	0	2	7	12
16	78	E	*	.800	1.000	0	0	3	5
16	80	E	*	1.250	1.000	0	1	4	6
16	81	B	*	1.100	1.000	0	1	4	5
22	32	B	*	1.250	1.000	0	2	4	6
26	16	B	*	1.100	1.000	1	2	10	15
26	33	B	*	1.030	1.030	0	1	1	1
26	70	B	*	1.100	1.100	1	2	2	2
26	71	E	*	1.020	1.020	3	6	6	6
26	76	B	*	1.020	1.020	3	6	6	6

27	32	E	*	1.200	1.000	0	1	3	5
-----									
28	4	B	*	1.200	1.200	1	3	3	3
28	16	B	*	1.200	1.000	1	3	7	10
28	21	B	*	1.100	1.100	0	3	3	3
28	32	E	*	1.250	1.000	1	3	7	10
28	52	B	*	.930	.930	1	5	5	5
28	55	B	*	.930	.930	1	5	5	5
28	69	E	*	1.050	1.050	1	3	3	3
28	75	E	*	1.050	1.000	3	6	9	12
28	76	B	*	1.050	1.000	3	6	9	12
-----									
29	11	E	*	.950	1.000	2	4	6	8
29	12	E	*	.950	1.000	2	4	6	8
29	33	B	*	1.200	1.000	0	2	4	6
29	71	B	*	1.500	1.500	0	2	2	2
29	74	E	*	1.200	1.100	4	6	8	10
29	75	E	*	1.500	1.500	3	6	6	6
29	76	E	*	1.500	1.500	3	6	6	6
29	78	B	*	1.200	1.100	2	4	6	8
29	81	E	*	1.500	1.500	3	6	6	6
-----									
30	29	E	*	.900	.900	0	0	0	0
30	34	E	*	.800	.800	0	0	0	0
30	46	E	*	.900	.900	0	0	0	0
30	66	B	*	.900	1.000	0	0	4	6
30	69	B	*	.900	1.000	0	0	4	6
-----									
31	1	E	*	.050	1.000	0	2	4	6
31	4	E	*	.050	1.000	0	2	4	6
31	16	B	*	1.050	1.000	4	4	4	20
31	33	E	*	1.050	1.000	0	2	4	6
31	66	E	*	1.150	1.000	0	0	0	4
31	67	E	*	1.050	1.000	0	2	4	6
31	70	B	*	1.050	1.000	2	2	4	6
31	76	B	*	1.250	1.250	2	4	4	4
31	78	E	*	1.050	1.050	0	2	2	2
-----									
33	7	B	*	.100	.100	2	4	4	4
33	51	B	*	1.100	1.100	2	4	4	4
33	71	E	*	1.100	1.100	3	6	6	6
33	78	E	*	1.020	1.020	0	2	2	2
33	81	B	*	1.050	1.050	3	6	6	6
-----									
35	72	E	*	2.000	1.200	1	2	5	10

35	73	B	*	2.000	1.200	1	2	5	20
-----									
37	29	B	*	.950	.950	0	0	0	0
37	66	B	*	.900	1.000	0	0	4	6
37	69	B	*	.900	1.000	0	0	4	6
-----									
38	29	B	*	.950	.950	0	0	0	0
38	66	B	*	.900	1.000	0	0	4	6
38	69	B	*	.900	1.000	0	0	4	6
-----									
39	4	B	*	1.050	1.050	0	3	3	3
39	78	B	*	1.100	1.100	2	4	4	4
39	81	B	*	1.100	1.100	0	3	3	3
-----									
40	46	B	*	1.200	1.150	2	4	6	10
40	66	B	*	1.050	1.000	0	0	0	2
-----									
41	21	B	*	1.050	1.050	0	5	5	5
41	22	B	*	1.050	1.050	0	5	5	5
-----									
42	2	B	*	1.200	1.200	0	1	1	1
42	22	B	*	1.200	1.200	0	1	1	1
42	76	B	*	1.200	1.200	1	3	3	3
42	60	B	*	1.050	1.050	0	1	1	1
42	81	B	*	1.200	1.200	1	3	3	3
-----									
43	1	B	*	.950	1.000	0	0	3	7
43	66	B	*	1.050	1.000	0	2	4	7
43	78	B	*	1.050	1.050	0	2	2	2
43	81	B	*	1.150	1.150	1	3	3	3
-----									
44	1	B	*	1.150	1.000	0	0	5	10
44	8	B	*	.950	1.000	0	2	6	8
44	9	B	*	.900	1.000	0	2	6	8
44	13	B	*	.900	1.000	0	2	6	8
44	14	B	*	1.150	1.000	2	4	10	15
44	66	B	*	1.100	1.000	0	0	0	5
-----									
45	1	B	*	.600	1.000	1	2	6	10

45	46	B	*	.950	1.000	1	2	6	10
45	50	B	*	.900	1.000	1	2	6	10
45	66	E	*	1.200	1.000	0	0	0	4
45	72	E	*	.850	1.000	0	0	6	10
45	73	B	*	.850	1.000	0	0	6	10

46	2	E	*	1.020	1.020	0	1	1	1
46	26	E	*	.950	.950	0	0	0	0
46	27	B	*	.950	.950	0	0	0	0
46	28	B	*	.950	.950	0	0	0	0
46	30	E	*	.950	.950	0	0	0	0
46	31	E	*	.950	.950	0	0	0	0
46	35	B	*	.950	.950	0	0	0	0
46	36	B	*	1.050	1.050	0	0	0	0
46	47	E	*	.950	.950	0	2	2	2
46	66	E	*	1.050	1.000	0	2	3	4
46	71	E	*	1.100	1.100	0	2	2	2
46	75	B	*	1.050	1.050	0	2	2	2
46	76	E	*	1.050	1.050	0	2	2	2
46	78	E	*	1.050	1.050	0	2	2	2
46	80	B	*	1.050	1.050	0	2	2	2
46	81	B	*	1.100	1.100	0	2	2	2

47	16	E	*	1.100	1.100	2	6	6	6
47	33	E	*	1.100	1.100	2	6	6	6
47	47	B	*	1.100	1.100	2	6	6	6
47	66	B	*	1.100	1.000	0	3	5	6
47	67	E	*	1.100	1.100	2	6	6	6
47	69	E	*	1.100	1.100	2	6	6	6
47	70	E	*	1.050	1.050	2	6	6	6
47	71	E	*	1.050	1.050	2	6	6	6
47	75	E	*	1.100	1.100	2	6	6	6
47	76	E	*	1.100	1.100	2	6	6	6
47	78	B	*	1.100	1.100	2	6	6	6
47	80	B	*	1.100	1.100	2	6	6	6
47	81	E	*	1.100	1.100	2	6	6	6

48	36	B	*	1.050	1.050	0	2	2	2
48	47	B	*	.950	.950	0	4	4	4
48	66	E	*	1.050	1.000	2	4	5	6
48	67	E	*	1.050	1.000	2	4	5	6
48	68	E	*	1.050	1.050	2	4	4	4
48	69	B	*	1.050	1.050	2	4	4	4
48	70	E	*	1.050	1.050	2	4	4	4
48	71	E	*	1.030	1.030	2	4	4	4
48	75	B	*	1.050	1.050	0	4	4	4
48	76	B	*	1.050	1.050	0	4	4	4
48	78	E	*	1.105	1.050	0	4	4	4
48	81	E	*	1.500	1.500	2	4	4	4

49	16	B	*	1.050	1.000	0	0	0	4
49	66	E	*	1.050	1.000	0	1	2	3
49	68	E	*	1.050	1.000	0	1	2	4
49	69	B	*	1.050	1.000	0	1	2	4
49	70	B	*	1.050	1.000	0	1	2	4
49	72	E	*	1.050	1.000	0	1	2	4
49	73	E	*	1.050	1.000	0	1	2	4
49	75	B	*	1.030	1.000	0	1	2	4
49	78	B	*	1.150	1.000	0	1	4	6

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50	16	B	*	.950	.950	0	2	2	2
50	66	E	*	.950	1.000	0	0	0	5
50	78	B	*	.950	1.000	2	4	6	10

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51	1	E	*	1.100	1.000	0	2	4	6
51	5	E	*	.610	.610	1	4	4	4
51	6	B	*	.610	.610	1	4	4	4
51	8	B	*	.610	.610	1	4	4	4
51	9	E	*	.610	.610	1	4	4	4
51	10	E	*	.610	.610	1	4	4	4
51	14	B	*	.610	.610	1	4	4	4
51	15	B	*	.610	.610	1	4	4	4
51	17	E	*	.610	.610	1	4	4	4
51	18	E	*	.610	.610	1	4	4	4
51	22	B	*	.610	.610	1	4	4	4
51	26	B	*	.610	.610	1	4	4	4
51	27	E	*	.610	.610	1	4	4	4
51	28	E	*	.610	.610	1	4	4	4
51	30	B	*	.610	.610	1	4	4	4
51	31	B	*	.610	.610	1	4	4	4
51	34	E	*	.610	.610	1	4	4	4
51	50	E	*	.610	.610	1	4	4	4
51	52	B	*	.610	.610	1	4	4	4
51	53	B	*	.610	.610	1	4	4	4
51	55	E	*	.610	.610	1	4	4	4
51	66	E	*	.900	1.000	0	0	4	8
51	72	B	*	1.050	1.000	0	0	4	8
51	73	B	*	1.050	1.000	0	0	4	8
51	76	E	*	1.500	1.500	0	4	4	4

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52	66	B	*	.900	1.000	0	0	0	2
52	72	B	*	.900	1.000	0	1	2	5
52	73	E	*	.900	1.000	0	1	2	5

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53	7	E	*	.750	.750	0	2	2	2
53	36	B	*	1.250	1.250	0	2	2	2
53	66	E	*	1.100	1.000	0	2	4	6
53	67	E	*	1.100	1.100	0	2	2	2

53	68	B	*	1.050	1.050	0	2	2	2
53	69	E	*	1.100	1.100	0	2	2	2
53	70	E	*	1.050	1.050	0	2	2	2
53	71	B	*	1.100	1.100	0	2	2	2
53	75	B	*	1.100	1.100	0	2	2	2
53	76	E	*	1.100	1.100	0	2	2	2
53	78	E	*	1.100	1.000	0	2	6	8
53	80	B	*	1.100	1.100	0	2	2	2
53	81	B	*	1.250	1.250	0	2	2	2

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54	36	E	*	2.000	2.000	1	3	3	3
54	66	E	*	1.500	1.000	0	3	5	6
54	78	B	*	1.100	1.100	1	3	3	3
54	81	B	*	2.000	2.000	0	3	3	3

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55	51	E	*	.900	.900	0	4	4	4
55	66	E	*	.980	1.000	0	0	1	3
55	78	E	*	.970	1.000	4	5	8	12

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57	81	E	*	1.050	1.050	0	2	2	2
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58	16	B	*	1.150	1.000	0	0	2	5
58	66	B	*	1.050	1.000	0	0	0	3
58	69	E	*	1.100	1.000	0	0	2	5
58	72	E	*	1.100	1.000	0	0	2	5
58	73	B	*	1.200	1.000	0	0	2	5
58	75	B	*	1.100	1.000	0	0	2	5
58	78	E	*	1.050	1.000	1	2	5	7

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62	7	B	*	.750	.750	1	5	5	5
62	11	B	*	.900	.900	0	5	5	5
62	12	E	*	.900	.900	0	5	5	5
62	16	E	*	1.080	1.000	3	5	10	15
62	33	B	*	1.020	1.000	0	3	6	7
62	47	B	*	.950	1.000	0	2	5	7
62	51	E	*	1.200	1.150	4	6	10	15
62	67	B	*	1.150	1.000	4	6	10	15
62	71	B	*	1.100	1.100	0	4	4	4
62	74	B	*	1.200	1.100	4	6	13	19
62	78	E	*	1.200	1.100	2	4	10	15

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64	11	B	*	1.100	1.000	2	5	15	20
64	12	B	*	1.100	1.000	2	5	15	20
64	14	E	*	1.050	1.000	2	5	15	20
64	26	E	*	1.100	1.000	2	5	13	20

64	27	B	*	1.100	1.000	2	5	8	20
64	28	B	*	1.100	1.000	2	5	6	20
64	35	B	*	1.100	1.000	2	5	15	20
64	36	B	*	1.050	1.000	2	5	15	20
64	66	B	*	.900	1.000	0	2	3	5
64	81	B	*	1.100	1.100	2	6	6	6

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65	2	B	*	1.350	1.200	0	2	15	20
65	16	B	*	.950	1.000	0	0	0	2
65	21	B	*	1.250	1.250	0	5	5	5
65	32	B	*	1.050	1.000	0	5	10	15
65	32	B	*	1.200	1.050	0	2	7	12
65	47	B	*	.900	1.000	0	3	5	15
65	66	B	*	1.100	1.000	0	0	0	5
65	67	B	*	1.100	1.000	0	2	10	15
65	71	B	*	1.200	1.200	0	2	2	2
65	76	B	*	1.300	1.300	0	2	2	2
65	78	B	*	1.050	1.050	3	5	3	3

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66	16	B	*	.950	1.000	0	0	0	2
66	32	B	*	1.050	1.050	0	1	1	1
66	69	B	*	1.050	1.000	0	2	6	10
66	70	B	*	1.050	1.000	0	2	6	10

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70	14	B	*	.950	.970	3	5	8	11
70	16	B	*	1.100	1.000	0	3	10	20
70	19	B	*	1.100	1.000	0	2	8	12
70	32	B	*	1.150	1.050	0	2	8	15
70	33	B	*	1.100	1.000	0	2	10	20
70	47	B	*	.900	.900	0	3	3	3
70	66	B	*	1.020	1.000	0	0	0	3
70	67	B	*	1.200	1.100	0	2	12	17
70	69	B	*	1.030	1.030	0	2	2	2
70	70	B	*	1.030	1.030	0	2	2	2
70	71	B	*	1.030	1.030	0	2	2	2
70	75	B	*	1.030	1.030	0	2	2	2
70	76	B	*	1.030	1.030	0	2	2	2
70	78	B	*	1.050	1.050	0	0	0	0
70	80	B	*	1.030	1.030	0	2	2	2
70	81	B	*	1.050	1.050	0	2	2	2

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71	19	B	*	1.200	1.000	0	4	14	19
71	21	B	*	1.100	1.100	2	5	5	5
71	22	B	*	1.100	1.100	2	5	5	5
71	33	B	*	1.150	1.000	0	4	12	21
71	74	B	*	1.200	1.100	8	13	18	23
71	78	B	*	1.300	1.200	3	5	10	15

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73	2	B	*	1.250	1.150	0	2	12	17
73	5	B	*	.950	.950	0	4	4	4
73	8	B	*	.950	.950	0	4	4	4
73	9	B	*	.950	.950	0	4	4	4
73	10	E	*	.950	.950	0	4	4	4
73	11	B	*	.960	1.000	2	5	10	15
73	12	B	*	.960	1.000	2	5	10	15
73	14	B	*	.960	1.000	2	5	10	15
73	15	E	*	.950	.950	0	4	4	4
73	16	B	*	1.150	1.000	0	2	12	19
73	19	B	*	1.100	1.000	0	2	8	15
73	20	E	*	.950	1.000	0	3	5	10
73	21	E	*	1.100	1.100	0	3	3	3
73	22	B	*	1.100	1.100	0	2	2	2
73	66	B	*	1.500	1.000	0	0	0	5
73	67	E	*	1.050	1.000	1	3	5	10
73	71	E	*	1.100	1.000	1	3	5	10
73	76	B	*	1.100	1.100	1	3	3	3
73	78	B	*	1.150	1.000	0	2	8	12
73	81	E	*	1.100	1.100	1	3	3	3
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74	1	B	*	1.050	1.000	0	3	5	10
74	19	B	*	1.050	1.000	0	3	9	15
-----									
77	7	E	*	1.100	1.100	0	4	4	4
-----									
78	7	B	*	.010	.010	4	16	16	16
78	51	B	*	1.100	1.100	4	16	16	16
-----									
79	1	E	*	1.020	1.000	0	3	5	7
79	66	E	*	.900	1.000	0	3	5	7
-----									
80	66	B	*	.980	1.000	0	1	2	3
-----									
82	16	E	*	1.150	1.150	2	6	6	6
82	33	E	*	1.100	1.100	2	6	6	6
82	47	E	*	.900	.900	2	6	6	6
82	66	B	*	1.100	1.000	2	3	4	6
82	67	E	*	1.100	1.100	2	6	6	6
82	68	E	*	1.050	1.050	2	6	6	6
82	71	B	*	1.100	1.100	2	6	6	6
82	75	E	*	1.100	1.100	2	6	6	6
82	76	E	*	1.100	1.100	2	6	6	6
82	78	E	*	1.100	1.100	2	6	6	6



82	80	E	*	1.100	1.100	2	6	6	6
82	81	E	*	1.100	1.100	2	6	6	6

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83	32	E	*	2.000	2.000	2	6	6	6
83	33	B	*	1.050	1.050	2	6	6	6
83	47	B	*	.950	.950	2	6	6	6
83	66	E	*	1.500	1.000	0	2	4	6
83	67	B	*	1.050	1.050	2	6	6	6
83	68	B	*	1.050	1.050	2	6	6	6
83	69	B	*	1.250	1.250	2	6	6	6
83	70	E	*	1.150	1.150	2	6	6	6
83	71	E	*	1.100	1.100	2	6	6	6
83	75	E	*	1.100	1.100	2	6	6	6
83	76	E	*	1.100	1.100	2	6	6	6
83	78	B	*	1.050	1.050	2	6	6	6
83	80	E	*	1.100	1.100	2	6	6	6
83	81	E	*	1.100	1.100	2	6	6	6

---

84	1	B	*	.950	.950	0	4	4	4
84	14	E	*	1.020	1.020	0	6	6	6
84	16	E	*	1.050	1.050	2	6	6	6
84	33	B	*	1.050	1.050	2	6	6	6
84	34	B	*	1.020	1.020	2	6	6	6
84	35	E	*	1.020	1.020	2	6	6	6
84	36	E	*	1.050	1.050	2	6	6	6
84	47	B	*	.950	.950	4	6	8	8
84	50	B	*	1.020	1.020	0	6	6	6
84	66	E	*	1.250	1.000	0	2	10	20
84	67	E	*	1.100	1.100	2	6	6	6
84	70	B	*	1.050	1.050	2	6	6	6
84	75	E	*	1.050	1.050	2	6	6	6
84	76	E	*	1.100	1.100	2	6	6	6
84	78	E	*	1.050	1.050	2	6	6	6
84	80	E	*	1.050	1.050	2	6	6	6
84	81	E	*	1.050	1.050	2	6	6	6

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85	33	E	*	1.050	1.050	1	4	4	4
85	66	E	*	1.100	1.000	0	2	5	7
85	67	B	*	1.050	1.050	1	4	4	4
85	69	B	*	1.500	1.500	0	2	2	2
85	75	E	*	1.100	1.100	2	4	4	4
85	78	E	*	1.050	1.050	2	4	4	4

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86	1	B	*	1.250	1.000	2	5	7	11
86	13	B	*	1.150	1.000	2	5	7	11

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87	1	E	*	1.250	1.000	1	3	5	7
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87	13	B	*	1.050	1.000	1	3	5	7
87	14	E	*	.950	1.000	1	3	5	7
87	13	E	*	.950	1.000	1	3	5	7
87	46	B	*	.750	1.000	1	3	5	7
87	51	B	*	.800	.800	1	3	3	3
-----									
88	7	E	*	1.200	1.200	1	3	3	3
-----									
89	16	B	*	.800	1.000	2	5	7	11
89	32	B	*	.850	1.000	2	5	7	11
-----									
90	16	E	*	.800	1.000	2	5	7	11
90	32	E	*	.850	1.000	2	5	7	11
-----									
91	16	B	*	.800	1.000	2	5	7	11
-----									
92	20	E	*	.750	.750	2	4	4	4
-----									
93	68	E	*	.980	1.000	1	2	4	5
-----									
94	70	E	*	.800	.300	1	2	2	2
94	76	E	*	.800	.800	1	2	2	2
94	78	B	*	.800	.800	1	2	2	2
-----									
95	76	E	*	.950	.950	2	4	4	4
-----									

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## **Appendix 7 to Annex II**

### **Examples Of How To Conduct Alternative Futures Analysis And Policy Impact Analysis Using The INTERAX Process (20 SEPTEMBER 1984)**

1. **PURPOSE.** To present the booklet "Examples of How to Conduct Alternative Futures Analysis and Policy Impact Analysis Using the INTERAX Process (20 September 1984)."

2. **Discussion.**

a. Attached as Tab A is the complete booklet as presented to planners within the Professional Development of Officers Study Group.

b. This booklet is an example of how to conduct single scenario analysis using INTERAX.

Tab A — Booklet, Examples of How to Conduct Alternative Futures Analysis and Policy Impact Analysis Using the INTERAX Process

# **Professional Development Of Officers Study**

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**Examples of How to Conduct  
Alternative Futures Analysis and Policy Impact Analysis  
Using the INTERAX Process**

**20 September 1984**

Recommendations for the improvement of this book are strongly encouraged by the Professional Development of Officers Study -Futures Team. Recommendations may be forwarded to the team at (AV) 227-6538/6550/6559 or (Cml) (202) 697-6538/ 6550/6559.

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## Overview

This book contains examples of how to conduct alternative futures analysis and policy impact analysis using the INTERAX process.

The process of conducting alternative futures analysis is done in four iterative phases. First, the analyst conducts a literature search or "environmental scan" to identify events and trends which describe and/or impact on the construct under analysis—in this case, the US Army Officer Professional Development System. The listing of events and trends that are currently in the INTERAX model are found in Parts 2 and 3. These events and trends are categorized into six divisions—"international," "political," "technological," "social," "Department of Defense" and "Army (including training, education, socialization and assignments)." Some of the more prolific sources used to develop the list of events and trends were: "The Army Plan," the "Extended Planning Annex" of the Program Operating Memorandum, the "Army 21" doctrine, the "Logistics 21" doctrine, the "Personnel Assessment 2002," the Officer Personnel Management Study's "Look into the Future," the "Army Long-Range Appraisal," the Arroyo Center's "Issues Underlying Army Policy," documents from the Army War College's Strategic Studies Institute, documents from the US Census Bureau, documents from the Congressional Research Service, the best-seller Megatrends, the US Air Force's "Alternative Futures Project—June, 1984," the "Dialog" telecommunications network and interviews with futurists throughout the Department of Defense, the private sector and senior executives of the US Army.

Second, the analyst identifies the probabilities of occurrence of the events cumulative (probability) and the trend levels for each year under analysis (in this study, the years of analysis are 1984 through 2025). These data were determined by gaining the opinions of respected futurists and senior executives in a variety of disciplines within the Department of Defense. In some cases, the data comes from projections made by other agencies within the federal government such as the Census Bureau.

Third, the analyst compares each event with all other events and compares each event with all other trends to determine and make judgements as to the impact of the event on the other events and trends should the event actually occur. This is referred to as "cross-impact analysis." See part 7 for a complete description of how to conduct a cross-impact analysis.

Finally, the analyst conducts computer simulations of alternative scenarios. Part 4 shows the events which occurred during three separate runs of the INTERAX model. Part 5 shows a narrative description of the first alternative scenario. This narrative is written by the analyst in order to develop a rich backdrop against which policies may be applied. Part 6 shows a narrative description of a portion of the scenario which the analyst isolates from the larger scenario so as to set-off that part of the scenario for detailed policy analysis. Part 8 shows selected graphs of trend values for each of the three scenarios and part 9 show those trends after the application of policy.

## Events

1-ANTI-MILITARY PRESIDENT—An anti-military president takes office.

2-GI BILL—Congress reinstates the GI Bill for education.

3-SKILL QUALIFICATION TEST—Army officers (W01 to 06) are required to take periodic skill qualification tests.

4-NUC WEAPON FUNDS DENIED—Congress refuses to fund production of a major nuclear weapon system.

5-MEASURE OFFICER POTENTIAL—An accurate and credible measure of Army officer abilities with Army requirements is developed.

6-ABILITIES/REQTS MATCH—An accurate and credible system for matching Army officer abilities with Army requirements is developed.

8-UNAUTHORIZED NUCLEAR LAU—A US Army officer initiates a successful unauthorized launch of a nuclear weapon against the USSR (US and USSR are not in armed conflict). The missile is diverted to a remote area by the US and little damage results.

9-ARMY TO CONTROL RIOTS—Congress authorizes the use of active duty military forces to control riots in the US.

10-RETIREMENT CHANGES EXTEND—Army retirement system is restructured so the minimum TIS at retirement is extended by 10 years.

11-RESERVE MOBILIZED—Full mobilization of the Army reserve component is ordered by the president.

12-AC COMMANDS RC BATTALION—Active component Army officers are assigned to command at least 25% of the reserve component battalions.

13-US IN MID/HIGH CONV WAR—US is involved in a mid-to-high-intensity conventional armed conflict with a major power.

14-WOMEN UNRESTRICTED—All restrictions on the assignment and utilization of women in the Army are removed.

15-US IN LOW-INTENSITY WAR—US is involved in a low-intensity conventional armed conflict with a minor power.

16-US IN BIO/CHEM WAR—US is involved in an armed conflict in which chemical or biological weapons are exchanged.

17-US/CHINA DEFENSE TREATY—US and China sign a mutual defense treaty.

20-NEW "CUBAN" MISSILE CRIS—US is involved in an international confrontation at least as dangerous as the Cuban Missile Crisis of 1962.

21-US CITY NUKED—Terrorists detonate a nuclear device in a US city.

22-US NUKE WEAPON ACCIDENT—A US nuclear weapon detonates accidentally within the US borders.

23-CONFLICT LEAD TO WWII—A non-nuclear conflict breaks out between a major power and some lesser nation, raising the fears that the conflict may escalate into WWII.

25-NUCLEAR FREEZE—A verifiable mutual freeze on nuclear weapons production and deployment is agreed upon by the US and the USSR.

26-3-YEAR COMMAND TOURS—Army increases length of battalion/brigade command tours to 36 months.

27-INTERNL MIL FORCE—An international military force is established to guarantee world peace and enforce UN and World Court decisions.

28-ARMY 21 ADOPTED—Total Army converts to a battlefield organizational concept which envisions tactical regiments and a small higher control headquarters with an Air-Land force.

29-IMPROVED HUMAN MEMORY—Medical breakthroughs occur which significantly improve the effectiveness of the human memory.

30-US WITHDRAWS FROM NATO—US withdraws from the military and civilian arms of NATO.

31-ARMY ADOPTS LINE/STAFF—Army implements a general staff system patterned after the WWII German and/or current Navy model.

32-GERMANY UNIFIED—East and West Germany are unified peacefully.

33-CHINA &USSR REESTAB TIE—China and the USSR reestablish full economic and political ties.

35-MEXICO TURNS COMMUNIST—Mexico joins the communist block.

36-LATERAL ENTRY OF CIV—Direct commissions to Major and Lieutenant Colonel are granted to civilian specialists in technical fields experiencing a shortage of officers (in addition to AMEDD, JAG and CHAPLAIN).

37-FRANCE REJOINS NATO—France rejoins the military arm of NATO and replaces the 5th US Corps along the German border (5th US Corps returns home).

38-US WITHDRAWS TROOPS—US adopts an isolationist stance and withdraws a large number of American troops from foreign soil (US is no longer the world's policeman).

39-MANDATORY NATIONAL SVC—Congress mandates at least two years of national service (either civilian or military) for all 18-year olds.

40-REDUCED ACQUISITION TIME—Army procurement regulations are changed to reduce major equipment acquisition time.

41-70% STDNT USE COMPUTERS—At least 70% of all US college students use personal computers as part of their education.

43-MERIT PAY FOR OFFICERS—Congress approves a merit pay system for Army officers (as opposed to the current system of "grade" and "time in service").

44-VESTED RETIREMENT — Congress adopts a vested retirement system for military personnel (e.g., soldiers can leave the service early and receive reduced retirement pay).

45-DEPRESSION—A major depression occurs in the US (e.g., the national unemployment rate exceeds 15% and it seems likely that it will continue for at least 4 years).

49-ARMY PATROLS MEX BORDER—President directs Army troops to patrol the border between the US and Mexico.

50-RESERVES ASGD NATO MSN—Total US commitment to NATO is filled by reserve units stationed in the US.

51-US MIL FORCES COMBINED—US military services are combined into one uniformed service (e.g., Canadian military system).

52-ANTI-MIL MEDIA CAMPAIGN—US media conducts an extensive anti-military campaign.

55-CORPORATE SCHOLARSHIPS—Large private corporations establish lucrative college student financial aid packages with follow-on work obligations.

57-GRAD DEGREES BY COMPUTER—At least 75% of all major universities offer a full range of graduate degree programs by a national computer network.

58-US PROTECTS FOREIGN SUPP—US Army moves to protect a foreign nation which is a supplier of strategic resources to the US or its allies.

59-HYDROGEN ECONOMY—A commercially viable technology is demonstrated that permits the emergence of a "hydrogen economy" and a major reduction in dependence on fossil fuels.

60-ANTI-TECHNOLOGY MOVEMENT—An anti-technology movement more intense than any known to date emerges throughout the US to block certain lines of physical and biological research.

61-COLLEGE BY COMPUTER NETW—A free-access national educational computer network is established by the federal government.

62-RAPID LEARNING—Commercially available biological technologies are developed that facilitate rapid learning.

63-CHEAP FOOD—Genetic engineering break-throughs provide an abundant, inexpensive food source.

64-DUAL LANGUAGE REQT—Army requires all officers to know a foreign language.

65-FIELD DECISION SUPPORT SYS—Army fields computerized decision support systems which are available to all commanders at the company level and higher.

66-ARMY PROTECT DOMESTIC—Army assigned the mission of security of major public facilities and other essential services.

67-COMMUNIC MADE EMP INVULN—Scientists improve all military communications systems so that they are invulnerable to electromagnetic pulses from nuclear detonations or electronic countermeasures.

70-ELECTRONIC WARGAMES — Army fields staff-oriented, electronic wargames for training.

71-5TH GENERATION COMPUTER—The Japanese succeed in developing the world's first fifth generation computer.

73-SUPER-POWERFUL HAND-HELD—Low cost hand-held computers are developed which exceed current main-frame computer capabilities. The Army issues these to every officer for access to information (telecommunication), problem solving and electronic smart maps, etc.

74-US SPACE DEPT CREATED—All military space responsibilities are consolidated into a 4th defense department—the US Space Force.

75-CRAZY STATE GETS NUKE CAP—A country led by an irrational head of state acquires an operational nuclear capability.

77-50% DROP ROTC—The number of universities participating in Army ROTC programs declines by at least 50% from the number that participated in 1984.

78-NO INTELLECTUAL DEFICIENCIES—Public school systems adopt new learning techniques which virtually eliminate all intellectual deficiencies caused by early-childhood deprivation.

79-ANTI-ARMS DEMONSTRATIONS—Federal government starts a system of free universities that provide a college education in exchange for federal work which can be fulfilled by military service.

81-FEDERAL SCHOLARSHIPS— Federal government starts a system of free universities that provide a college education in exchange for federal work which can be fulfilled by military service.

## Trends

1. LOSS OF OFFICERS TO CIV—Rate of loss of officers to the civilian sector or to other services.

2. PERCENT POS REQT COMPUTER USE—Percent of officer positions requiring daily operations of computer systems to accomplish the mission.

3. OFFICERS USING COMPUTERS— Percentage of Army officers with the ability to effectively use computer systems to accomplish the mission.



4. PERCENT WOMEN IN ARMY— Percentage of women in the Army.

6. REQT FOR ENGR AND TECH SKIL—Requirements for Army officers with engineering and technical skills.

7. PERCENT DEFICIENT IN BASIC SKI—Percentage of Army officers who are deficient in basic educational skills.

9. POLITICAL PRESSURE FOR CTR— Pressure from politicians to take detailed control of tactical Army combat operations.

10. PEACE MOVEMENT INFLUENCE— Influence of world peace movement organizations on US policies.

11. TIME TO TRAIN CO GRADE—Time needed to prepare officers to meet minimum company grade requirements.

12. TIME TO TRAIN FIELD GRAD—Time needed to prepare officers to meet minimum field grade requirements.

13. AVERAGE TIS FOR OFFICERS— Average time in service for officers.

14. COST OF OFFICER TNG AND ED—Cost of Army officer training and education system in constant dollars.

15. PERCENT OF OFFICER MENTORING—Percent of Army officers who receive effective mentoring from their superiors/supervisors (as might be determined from opinion surveys).

16. CBT READINESS, CONV FORC— Combat readiness of conventional Army forces.

19. US VS USSR TECHNOLOGY—Ratio of level of US technology to USSR.

20. OFFICER RETRAIN REQT—Amount of Army officer retraining required due to skill obsolescence.

21. COMPUTER/COMM-COMBAT— Degree to which Army makes effective use of computers/communications to accomplish its COMBAT missions.

22. COMPUTER/COMMO-SUPPORT— Degree to which Army makes effective use of computers/communications to accomplish its SUPPORT missions.

23. COMPUTER/COMMO-TRAINING— Degree to which Army makes effective use of computers/communications to accomplish its TRAINING missions.

24. COMPUTER/COMMO-EDUCATION— Degree to which Army makes effective use of computers/communications to accomplish its EDUCATION missions.

25. VALUE SET-COLLEGE GRADS— Compatibility of value set of college graduates aged 22-30 with Army values.

26. CONGRESS CTRL OF DEF POL— Congressional control of defense policy.

27. ARMY VS CIV COMPENSATION— Ratio of Army to civilian gross compensation.

28. TIME TO MOBILIZE RESERVE—Time required to mobilize and deploy reserve component units to reinforce active component units engaged in combat.

29. FORCE IN JOINT/COMBINE O— Incidence of Army forces involved in joint/combined operations.

31. TIME AVAIL FOR C AND C DECIS— Amount of time available for Army command and control decisions.

33. CDRS ABIL IN MID/HI CBT — Capability of Army commanders and their staffs to operate effectively for sustained periods in midand high-intensity combat.

34. COST OF PCS RELOCATION—Cost to the Army of permanent change of station.

39. OFFICER WITH COMBAT EXP— Percentage of Army officers with actual combat experience.

44. OFFICER WITH PC-HOME—Percentage of Army officers with PCs/terminals at home which are capable of supporting computer assisted instruction by telecommunications.

46. MODERNIZATION OF EQUIP—Rate of modernization of Army equipment (including weapons).

47. GAP-RESERVE VS REQT—Size of gap between capabilities of part-time field grade officers and the requirements of the positions they would fill in wartime.

48. ABILITY-MOBILE CBT OPS—Ability of the Army to conduct highly mobile, tactical combat operations.

49. CENT BTTFLD DECISN MAKING—Degree of centralization of Army decision making on the battlefield.

50. ARMY BUDGET-CONSTS—Size of the Army budget in constant dollars.

51. AVG SKL/APTITUDE LEVEL—Average skill/aptitude level of officers when they enter the Army.

52. NO. ENLISTED PERSONNEL—Number of enlisted personnel in the Army.

53. NO. TDA OFFICERS—Number of officers in the "TDA" Army.

54. NO. OFFICERS IN THS—Number of officers in resident schools in the THS account.

55. NO. OFFICERS IN TOE—Number of officers in the field Army.

56. NO OFFICERS IN NON-FLD—Number of officers in the "non-field" Army (Trend-53 plus Trend-54).

57. TOTAL ARMY OFFICERS—Total number of Army officers (Trend-55 plus Trend 56).

58. TOTAL ARMY PERSONNEL—Total size of the force (Trend-52 plus Trend-57).

60. INDX OF CIVILIAN USE—Index of Army peacetime functions which are civilianized and/or contracted-out.

61. USSR PENETR IN 3RD WORLD— Soviet power projections in Third World countries.

62. US/USSR TENSION—Level of tension between the USSR and the US.

65. HEW EXPEND LEVEL—Level of expenditures for health, education, welfare and other transfer payments.

66. ARMY ESPRIT DE CORPS—Level of Army esprit de corps.

67. ABIL OF JR TO REPL SR—The ability of junior commissioned officers, warrant officers and noncommissioned officers to replace senior leaders lost in combat.

70. MILIT EXPER IN CONGRESS—Level of military service experience in Congress.

72. NATL WILL TO SUPT MILIT—US national will to support military defense operations.

73. CONLR SPT FOR MILIT — Congressional support for the military.

74. THREAT OFF SKILL PROFICY— Level of Trend Army officers' skill proficiency.

77. GEOG DISPER OF THREAT — Geographic dispersion of threat.

78. ARMY OFF SKILL PROFICY—Level of Army officers skill proficiency.

82. COMPETENCE UNDER STRESS— Army officer competence under stress.

83. ARMY-THREAT SKILL PROFICY— Difference in skill proficiency between US Army officers and Threat Army officers (Threat-78 minus Trend-74).

THESE EVENTS OCCURRED DURING THREE SEPARATE RUNS OF THE INTERAX MODEL:

YEAR OCCURED	ALTERNATIVE FUTURE 1 "Challenging World I" Random # 9200257	ALTERNATIVE FUTURE 2 "Challenging World II" Random # 6959801	ALTERNATIVE FUTURE 3 "Peaceful World" Random # 6950441
1985	- - -	- - -	- - -
1986	- - -	20-New "Cuban" Msl Crisis 75-Crazy State Gets Nuke	45-Depression
1987	15-US Low Intense War	- - -	- - -
1988	70-Electo Wargames	- - -	- - -
1989	- - -	10-Retire Extd by 10 yrs	-52-Anti-Mil Media Campgn
1990	26-3 Years Cmd Tours 58-US Protects Fgn Spt	37-France Rejoins NATO 52-Anti-Mil Media Campgn	- - -
1991	75-Crazy State Gets Nuke 20-New "Cuban Msl Crisis 77-50% Drop in ROTC	40-Reduced Acquisition Ti	- - -
1992	- - -	55-Corporate Scholarships	- - -
1993	16-US Bio/Chem War 52-Anti-Mil Media Campgn	13-US Mid/High Convl War 36-Lateral Entry of Civs	58-US Protects Fgn Supp 38-US Withdraws Troops
1994	- - -	- - -	4-Nuke Wpns Funds Denied 75-Crazy State Gets Nuke
1995	- - -	4-Nuke Wpns Funds Denied 70-Electo Wargames	12-AC Cnds RC Battalions 59-Hydrogen Economy 65-Field Dec Spt System
1996	- - -	49-Army Patrols Mex Border	9-Army to Control Riots
1997	65-Field Dec Spt System 75-US Space Dept Created	- - -	- - -

<u>YEAR OCCURRED</u>	<u>ALTERNATIVE FUTURE 1</u> "Challenging World I" Random # 9200257	<u>ALTERNATIVE FUTURE 2</u> "Challenging World II" Random # 6959801	<u>ALTERNATIVE FUTURE 3</u> "Peaceful World" Random # 6950441
1998	17-US/China Defense Treaty 50-Reserves Asgd NATO Msn	28-Army 21 Adopted	36-Lateral Entry of Civs
1999	35-Mexico Turns Communist	- - -	- - -
2000	2-GI Bill 9-Army to Control Riots 28-Army 21 Adopted 55-Corporate Scholarships	- - -	28-Army 21 Adopted
2001	- - -	12-AC Cmds RC Battalions	3-Officer SQT Adopted 55-Corporate Schlorships
2002	63-Cheap Food Developed	15-US Low Intense War 23-Conflict Leads to WWII 73-Super-Powerful Hand-Held	- - -
2003	73-Super-Powerful Hand-Held	- - -	21-US City Nuked 63-Cheap Food 74-US Space Dept Created
2004	13-US Mid/Hi Conv1 War	74-US Space Dept Created	14-Women Unrestricted 73-Super-Powerful Hand-Held
2005	- - -	1-Anti-Mil Pres Takes Office	2-GI Bill 22-US Nuke Wpns Accident 57-Grad Degrees by Computer 79-Anti-Arms Demonstrations
2006	4-Nuke Wpns Funds Denied 61-College by Computer Net	60-Anti-Technology Mvmt	- - -
2007	- - -	16-US in Bio/Chem War 81-Federal Scholarships	- - -
2008	41-70% Stdnts Use Compters 78-No Intellect Deficiency	- - -	20-New "Cuban" Msl Crisis 39-Mandatory Natnl Svc

<u>YEAR OCCURED</u>	<u>ALTERNATIVE FUTURE 1</u> "Challenging World I" Random # 9200257	<u>ALTERNATIVE FUTURE 2</u> "Challenging World II" Random # 6959801	<u>ALTERNATIVE FUTURE 3</u> "Peaceful World" Random # 6950441
2009	39-Mandatory Natnl Svc	79-Anti-Arms Demonstrations	27-International Mil Force
2010	43-Merit Pay for Officers	35-Mexico Turns Communist	- - -
2011	- - -	41-70% Stdnts Use Computers 67-Mil Comms Made EMP-Proof	61-College by Computer Net
2012	- - -	- - -	33-China/USSR Reestab Ties 44-Vested Retirement Adopted
2013	38-US Withdraws Troops	58-US Protects Fgn Supp	- - -
2014	- - -	45-Depression 59-Hydrogen Economy	81-Federal Scholarships
2015	- - -	- - -	- - -
2016	- - -	39-Mandatory Natnl Svc	- - -
2017	5-Measure Officer Pentl 44-Vested Retirement	6-Abilities/Rqts Match 61-College by Computer 63-Cheap Food	10-Retire Extd by 10 Yrs 78-No Intellectual Deficy
2018	- - -	- - -	- - -
2019	6-Abilities/Reqts Match 62-Rapid Learning	- - -	- - -
2020	40-Reduced Acquisition Ti 67-Mil Comms Made EMP-Prof	- - -	- - -
2021	- - -	- - -	35-Mexico Turns Communist
2022	25-Nuclear Freeze	25-Nuclear Freeze	- - -
2023	11-Reserves Mobilized 1-Anti-Mil Pres Takes Office	57-Grad Degs by Computer	- - -

ALTERNATIVE FUTURE 3  
"Peaceful World"  
Random # 6950441

ALTERNATIVE FUTURE 2  
"Challenging World II"  
Random # 6959801

ALTERNATIVE FUTURE 1  
"Challenging World I"  
Random # 9200257

YEAR  
OCCURRED

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2025

## Narrative Description of Alternative Future 1— "Challenging World-I."

After 1984, the Army along with the rest of the Departments in DOD continued to enhance their war-fighting capabilities. The Army was engrossed in its efforts to establish the light infantry division. Tensions continued to flare in Central America and President Reagan, in his second term of office, took an even harder line in supporting the government in San Salvador. At the request of that government, the US committed troops to turn-back the growing influence of the Castro government in that region. The war lasted 89 days and left the government intact and the encroachment by the Cubans reversed.

The Army had been testing the capability of using computer technology in command-post exercises and in 1988 developed an electronic war-game which was fielded at the battalion level. It was a success and significantly enhanced the training of combat staffs at all levels.

After several years of rapid turnover in Army units, the Chief of Staff, Army (CSA) instituted a program to re-stabilize units experiencing turbulence by requiring commanders at the battalion level to serve for three years—a program abandoned six years earlier.

In 1990, the US sent a brigade from the 82d Airborne Division to protect the Trinidad government from the incursion of the Castro regime which was moving to seize the strategic bauxite fields on that tiny island. A year later, the Mobutu government in the newly found Namahana, Africa shocked the world by announcing that it had an operational nuclear capability. This developed into a crisis of the proportion of the 1962 Cuban missile crisis when Mobutu threatened to attack Liberia. The actions of the US in Trinidad and in Africa incensed many academics. By the end of 1991, approximately 50% of the Army ROTC's had been asked to leave the campuses.

Early in 1993, the US found itself in the midst of rising tensions between North and South Korea such that in November when the rice fields began to harden, the North Koreans invaded the South employing chemical weapons which demoralized

the defending South and the Americans. The US retaliated with chemical weapons thereby sparking an extensive anti-military media campaign within the US. The conflict lasted two years and was devastating to the US in casualties and capital resources.

The years which followed were benign for the Army. The Congress was beginning to talk about not being the world's policeman anymore and there was talk of leaving NATO or at least having the reserve forces take on the NATO mission from their home bases in the US.

In 1997, the Army fielded a computerized decision support system available to all commanders at the company level and above. The US and USSR had been testing the military uses of outer space such that by 1997 it was clear that a separate department in DOD was needed to concentrate on outer space defense; the US Space Force was established in that year, creating a drain on the Army for scientists, engineers and pilots.

In 1998, the US withdrew its forces from West Germany and assumed a reserve role in defense of that region by assigning the Army reserve components to defend from their CONUS bases. In the '90's, the size of the population in Mexico had gotten totally out of control. Food was in growing short supply, the government had become destabilized and popular sentiment in that region was turning toward the benefits which the communist world felt it could provide. After three years of civil war, the surviving military junta was communist.

Back in the US, there was a growing disenchantment among college-aged youth vis-a-vis the utility of college education. The down-turn in the '90's in the college-aged cohort was reversing, but the proportion of the cohort enrolling in college remained lower than in 1984. Something needed to be done. The Congress had been debating for several years that a GI Bill for education was needed as an inducement and many of the Fortune 500 companies were considering developing a corporate scholarship program in an effort to attract to the companies high school seniors and

other potential college candidates. In 2000, the GI Bill and a corporate scholarship program were instituted.

Army combat doctrine had developed to the extent that by 2000 the "Army 21" concept was nearly in place. Now that the Army fighting capability was oriented on smaller, more compact units and as state governments were not able to fund their national guard capability in the peacetime mission of riot control, the Army was given the mission of protecting large metropolitan areas in the event of large scale riots. This surprise mission for the Army resulted in a rush to add riot control and military operations in urban terrain training to resident and unit training programs.

Genetic engineers had been working for several years to create edible food stuffs. In 2002, a break-through occurred which made rice and other leafy green vegetables grow abundantly. It appeared that no country would need to experience famine again. To demonstrate the advancement, and to extend its influence in Africa, the US and the Starwanda government agreed to use the newly created U.S. Food Corps volunteers to introduce this new technology in Western Africa.

A computer technology breakthrough occurred in late 1999—a cheap hand-held computer which exceeded the main-frame computer capabilities of the mid-1980's. In 2003, the Army issued them to every officer for their personal information access, "expert system" use and a plethora of small tactical uses such as electronic "smart" maps, electronic order battle, etc.

The Mobuto government in Namahana, a neighbor of Starwanda, accused the US of intervening in African affairs with its food program and began attacking border towns, killing many Food Corps volunteers. In 2002, the Ferraro Administration moved to protect the volunteers and found itself embroiled in a conventional conflict of the proportion of the Vietnam War. The conflict lasted for nearly four years before the increasingly disenchanted Congress started denying Defense expenditures. Of particular note was the denial of funds for the first US Space Force weapon system—the Glenn laser-triggered nuclear space missile (the XNSM-1).

Advances in telecommunication with personal computers was growing rapidly as a result of the availability of super-powerful hand-held computers. More and more Americans were using centralized data bases in their personal life and at work. It was even possible by 2006 to gain an

undergraduate degree by computer. Students attending college on campus were using computers more and by 2008 over 70% of them were using computers for all courses.

In the years of the Starwanda Conflict, sentiment began to be heard in the Congress for a military draft. In fact, the corporate scholarship program which had begun at the turn of the century was causing a drain on the corps of public servants. Moreover, public service was losing its attractiveness at the national, state and even local level. It seemed that the only relief would be in the form of some sort of national service program. In 2009, with the support of all levels of government and popular support, the National Service Act was passed. The provisions of the act saw young men and women as apprentices in all levels of government serving for a required two years. This service could include military service in the enlisted or officer ranks. The program worked well. The Defense Department was able to hold down rising personnel costs by increasing pay raises for lower ranked enlisted and officers at a much slower rate than higher ranked enlisted and officers. By 2015, the number of soldiers in the middle enlisted and officer ranks was quite large, portending potentially huge retirement costs in later years. The Secretary of Defense proposed to Congress in 2016 that a vested retirement system should be installed which would permit service members to leave the military early with reduced retirement pay which would become payable 10 years after the member left the service. The Congress passed the law instituting the program in 2017.

In the years following the '80's, the Office of Personnel Management experienced turbulence in the management of its merit pay program. Experimentation with various methods proved successful, however, and in a combined project with the National Education Association and the American Federation of Teachers, the entire merit pay concept was showing success at rewarding the most productive employees. It was clear to the services that with the push to reduce the size of the semi-annual pay raises caused by the excessive inflation rate, that a merit pay program could compensate officers who were the most productive. A merit pay program for officers was passed by Congress in 2010 and was installed within two years.

The Starwanda Conflict was disastrous in its drain on human and capital resources. The government could no longer support forces in two major theaters -the reserve force mission in Europe and the active force mission in Asia. Since



having the reserve components taking the NATO mission was successful, it was thought that the reserves could assume the 8th Army mission in Korea as well. In 2013, the US withdrew its land and air forces from the Korean peninsula.

During the second decade of the 21st century, advances were made in the personnel management community. In 2017, an accurate and credible measure of Army officer potential was developed sufficiently to be installed in the company grades and junior field grades. Two years later, MILPERCEN developed an accurate and credible system for matching officer ability with Army personnel requirements.

In the first decade of the 21st century, biological researchers had developed in the laboratory a technology which enhanced rapid learning. Three bio-medical corporations funded an intensive project aimed at making this technology commercially available and in 2019 the Food and Drug Administration certified the product. This technology, coupled with the techniques developed in 2008 in the public school systems, whereby virtually all intellectual deficiencies caused by early childhood deprivation were eliminated, promised to revolutionize education in America. The Army could envision a complete revamping of its training and education system in the second quarter of the century. A Review of Education and Training Study (RETO X) was ordered by the CSA with a mission of determining the course of education and training in the light of the impact of the new technologies being used in the public sector.

In 2018, the Defense Department conducted a complete study of the materiel acquisition cycle.

In 2020, the Army revamped their procurement regulations resulting in dramatic reduction in its major materiel acquisition time. In this light, and with stepped-up research and development, the Army fielded its first radio system which was invulnerable to electromagnetic pulse.

Shortly after the turn of the century, the US and the USSR began to seriously consider a freeze on the production of new nuclear weapons systems. The most obvious draw-back had been the verifiability of the freeze. Through some careful negotiation, the two countries were able to reach a revolutionary agreement and a freeze in nuclear weapons production and further deployment was begun.

The winter of 2023-2024 began severely and was threatening to be the worst in recorded history. Washington, D.C. had experienced the heaviest snow fall ever and traffic through-out the Capital City was at a standstill for nearly two weeks in January, 2024. The inauguration of the President was conducted in a small ceremony on Capitol Hill. By early February, the country was covered with a heavy blanket of snow and ice. The National Guards of several states had been on full alert and were growing exhausted from conducting disaster relief operations because of 45 days of severe weather. Volcanic activity along the west coast was growing more intense and three huge volcanoes erupted, spewing so much dust into the atmosphere that the sun was blocked out across the entire country. The unfortunate result was a series of ice storms which brought the country to a complete stand-still. The President mobilized the Army reserves to help cope with the nation-wide disaster.

## Policy Impact Analysis: Alternative Futures 1 and 2—"Challenging World I/II"

### 1. Pre-Policy Analysis:

a. Bio/Chem War: In 1993, the US was involved in an armed conflict in which biological and chemical weapons were exchanged. This conflict had dramatic effect on the ability of Army commanders and their staffs to operate effectively for sustained periods as this sort of conflict had not been routinely nor emphatically tested in training. The number of officer nuclear, biological and chemical target analysts had dwindled to a small cadre. The difference between "threat" officer and US officer skill proficiency was hypothesized to have grown steadily such that by the occurrence of the war, "threat" officers demonstrated that they were dramatically superior in the implementation of chemical and biological weapons to their US enemy. During the first year of the conflict, the esprit de corps throughout the Army was at a severely low level as individual soldiers were not able to effectively cope with the threat for which they were ill prepared. It was observed by psychologists and doctors analyzing their interview protocols with Army officers incapacitated by the stresses of the conflict that this conflict was disastrous for officer competence under the stresses of this biological/chemical war.

b. Army Officer Skill Testing: Regardless of the discussion on the benefits of officer skill competence and officer testing in the 1984 Officer Personnel Management Study (OPMS) and the Professional Development of Officer Study (PDOS), Army officer skill proficiency had not improved. Army schools continued to be oriented on low levels of skill proficiency and as a result, the ability of junior leaders to handle the complexity of senior leader positions when the need arose was continuously decreasing. Officer retraining due to skill obsolescence rose dramatically, producing a drain in increased TDY costs as officers sought functional and skill courses to keep pace with advancing technology. There was a growing sense of "me" orientation in the officer corps; and, senior officers were not nurturing their subordinates. In fact, in surveys of officers, one of their common complaints was that they

were not being mentored as they thought they should be.

c. Skill Obsolescence: The Army continued to field new weapons and support systems during the later half of the 80's and into the 90's. It was becoming clear that unless some system was developed to stem the burgeoning increase in new technologies within the Army, officers would have to spend a great deal of their time in retraining. By 2025, retraining was continuous. Officers made routine retraining trips via TDY to various Army functional and skill courses and were also taking advantage of civilian courses. This was a dramatic drain on unit TDY funds.

### 2. Policy Implementation:

a. Bio/Chem War: In 1986, the Army began a serious up-grade of their biological and chemical warfighting capability. The statutory prohibition on the offensive use of bio/chem munitions continued to remain in force, but this did not interfere with training for their possible use should it be necessary. The Field Artillery School re-established the requirement that all advanced course graduates become nuclear, biological and chemical target analysis qualified, and the Infantry and Armor schools developed courses which gave commanders and staff officers knowledge in the effective use of these weapons. A substantial portion of the Army Training/Proficiency Test included a test of unit proficiency in the nuclear, biological and chemical environment. The news media took note of the extensive training being done and conducted a favorable campaign for several years showing the reduction in the disparity between "threat" and US capabilities in these environments. It was generally felt by "Defense Watchers" that our deterrence in these forms of warfare were increasing as a result of the extensive training. Several years after the initiation of the training program, discussion in the international community began to surface about the possible need for an international military force to stem the potential use of "special" weapons. GAO studies conducted during the years which followed showed

that the Army was more combat ready than ever before.

b. **Army Officer Skill Testing:** In 1987, the Army implemented a program to test officers in basic professional skills. The program started small, with more junior officers being tested in basic skills every other year. The test was a paper-pencil test which had the effect of inducing junior officers to read technical and field manuals more than ever before. Senior officers took interest in their officer subordinates and were reported as spending many quality hours with young officers helping them prepare for the tests. The message was clear—All officers will eventually be tested; it was merely a matter of time. The data from the first two years of testing was collected by the Army Research Institute (ARI). It was becoming more and more obvious that the testing program contained accurate and credible measures of Army officer potential. Dr. Pearl Eence, ARI project director, set to work with the most intensive longitudinal study ever performed with Army officers. The "Eence Measure," as it came to be called, was first instituted in 1990. "I realize a three year longitudinal study isn't very long," Eence said, "but the data is so convincing that it would be foolish not to use it now!" As an

off-shoot of her work, the Military Personnel Center (MILPERCEN) developed an accurate and credible measure of Army officer potential. Some years later (1992), it was obvious that some officers were more suited for staff roles and, therefore, that a dual system of Line/Staff was a solution to the difficulties associated with training the generalist officer.

c. **Skill Obsolescence:** In 1986, the Army instituted a massive program to build retraining into daily operations. The budget for technical and tactical literature was increased in all units.

Part of the professional development of officers was the institution of courses at the unit level on technological changes. In 1990 the various branch schools created training contact teams which traveled from Post to Post updating installation training cadre on the latest changes in technology. In 2000, the Army began to experiment with computer assisted instruction (CAI) directly to officers' homes. Officer could "tap-into technology data bases and get up-dated immediately. By 2010, all officers were routinely sent copies of their branch journal which oriented itself predominately on the implementation of new technology.

CONDUCTING POLICY IMPACT ANALYSIS USING THE INTERAX MODEL:

1. General: The INTERAX model contains four sets of numbers--1.) nominal EVENT projections expressed as cumulative probabilities of occurrence by the years under consideration (1984-2025), 2) nominal TREND (and performance measure) projections expressed as a deviation from the base level in 1984 (the "starting" value is "1.0" for 1984), 3) the cross-impacts of EVENTS on other EVENTS (in some cases, a particular EVENT will not impact another EVENT), and 4) the cross-impact of EVENTS on TRENDS (in some cases, a particular EVENT will not impact a TREND).

When making policy interventions to a previously run alternative future, one makes adjustments to these four sets of numbers. The implementation of policies in INTERAX takes the form of altering:

Events by changing: Event probabilities;  
Event cross-impacts on other EVENTS;  
Forcing EVENTS to occur;  
Forcing EVENTS to not occur;

TRENDS by changing: TREND levels;  
EVENT cross-impacts on TRENDS;

It is not possible to add new nor take away current EVENTS and TRENDS in the model as part of the policy impact exercise as this will completely change the random number sequence in the computer program--this is an artifact of the INTERAX model.

2. An Example of How to Conduct Policy Impact Analysis: Through-out this example, refer to the current list of EVENTS and TRENDS for a complete definition. In order to work with INTERAX, a user should become familiar with the exact description of the EVENTS and TRENDS. This example uses the occurrence of "E-16 - US IN BIO CHEM WAR." If a Bio/Chem War were to occur, it would impact on these EVENTS and TRENDS which are currently in the INTERAX model. A "(+)" means a positive maximum impact and a "(-)" means a negative maximum impact:

EVENTS (Impact is:)

1-Anti-Mil Pres Takes Office (+)  
4-Nuc Wpns Funds Denied (+)  
14-Women's Role Unrestricted (-)  
17-US/China Defense Treaty (+)  
21-US City Nuked (+)  
25-Nuclear Freeze (+)  
27-Intl Military Force (+)  
30-US Withdraws from NATO (-)  
38-US Withdraws Troops (+)  
39-Mandatory Natnl Svc (+)  
40-Reduced Acquisition Time (+)  
52-Anti-Mil Media Campaign (+)  
60-Anti-Technology Movement (+)  
77-50% Drop in ROTC (+)  
79-Anti-Arms Demonstrations (+)

TRENDS (Impact Is:)

1-Loss of Officers to Civ (+)  
6-Reqd for Engr and Tech Skills (+)  
9-Political Pressure for Ctr (+)  
10-Peace Movement Influence (+)  
11-Time to Train CO Grade (+)  
12-Time to Train Fld Grade (+)  
14-Cost of Officer Trg and Ed (+)  
16-Cby Readiness, Conv Force (+)  
19-US vs USSR Technology (-)  
20-Officer Retrain Req ( - )  
21-Computer/Comm-Combat (+)  
22-Computer/Comm-Support (+)  
25-Value Set-College Grads (-)  
26-Congress Ctrl of Def Pol (+)  
29-Force in Joint/Combined Opns (+)

EVENTS (Impact is:)

TRENDS (Impact is:)

- 31-Time Avail for C and C Decis (-)
- 33-Cdrs Abil in Mid/Hi Cbt (-)
- 34-Cost of PCS Relocation (+)
- 39-Officer with Combat Exp (+)
- 46-Modernization of Equip (+)
- 48-Ability-Mobile Cbt Opns (-)
- 49-Cent Bttlflld Descisn Making (+)
- 50-Army Budget-Consts (+)
- 53-No. TDA Officers (-)
- 54-No. Officers in THS (-)
- 55-No. Officers in TOE (+)
- 61-USSR Penetr om 3rd World (+)
- 62-US/USSR Tension (+)
- 65-HEW Expend Level (-)
- 66-Army Esprit de Corps (-)
- 67-Abil of Jr to Repl Sr (+)
- 70-Milit Exper in Congress (+)
- 72-Natl Will to Supt Milit (+)
- 73-Conlrr Spt for Milit (+)
- 74-Threat Officer Skill Proficiency (+)
- 78-Army Officer Skill Proficiency (-)
- 82-Competence Under Stress (-)

In this example, the analyst looked at selected TREND values at and after the occurrence of the Bio/Chem War. He found a serious degradation in 33-Commanders Ability in Mid/Hi Conventional Conflict, T-66-Army Esprit de Corps, T-78-Army Officer Skill Proficiency and T-82-Competence Under Stress. He, also, found that T-74-Threat Officer Skill Proficiency was much higher than T-78-Army Officer Skill Proficiency. He hypothesized that if an intensive training program were conducted, these TRENDS could be reversed. He further hypothesized that by conducting this training and publishing the improvement in combat effectiveness that the deterrence effect would reduce the probability of EVENTS E-13-US in Mid/Hi Conv War and E-16-US in Bio/Chem War while increasing the probability of Event E-27-International Military Force. Every policy has its price. In this case, the analyst applied a factor of 10% to TRENDS T-11-Time to Train CO Grade and T-12-Time to Train Field Grade and applied a factor of 5% to TREND T-14-Cost of Officer Tng and Ed.

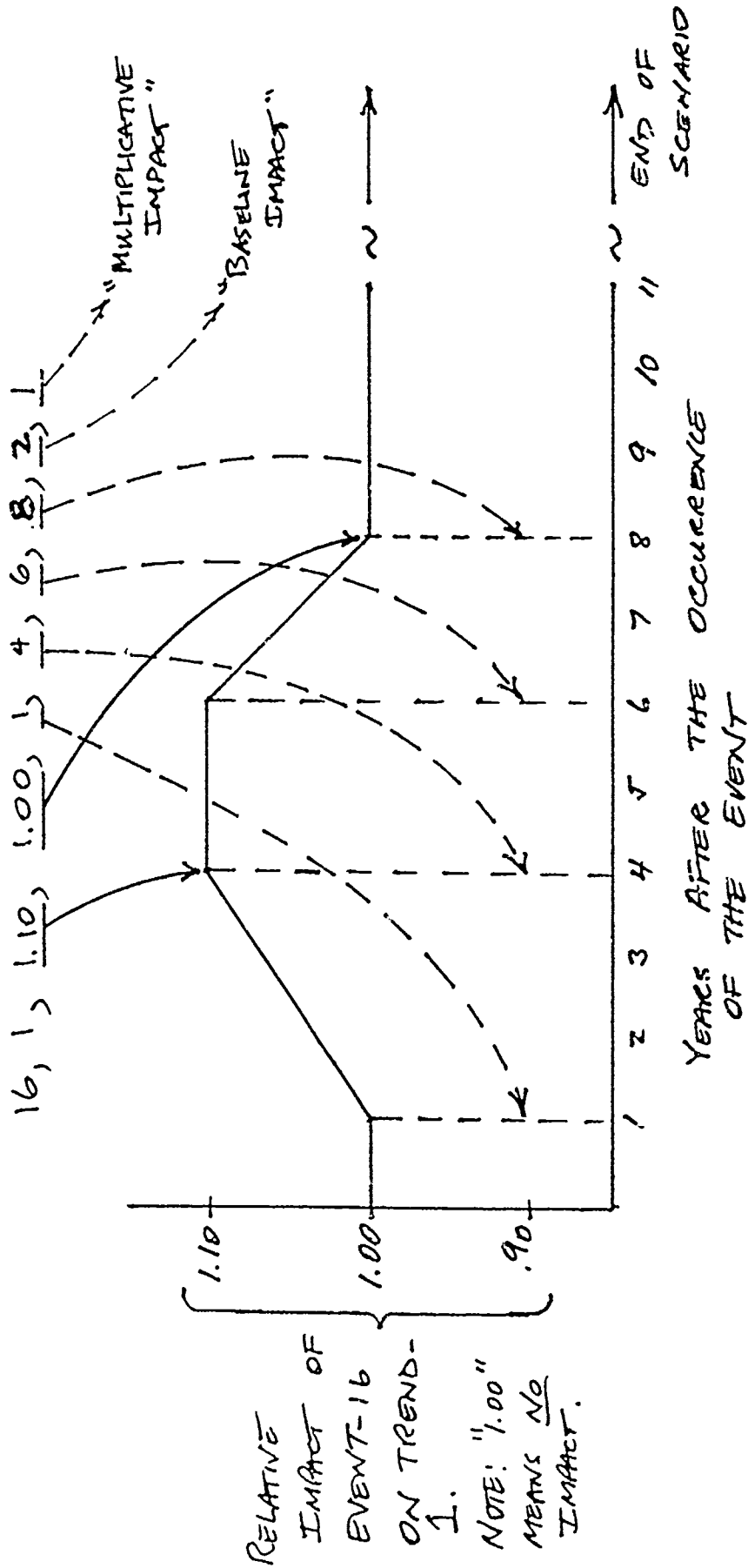
The following is a description of the numbers in the INTERAX model for a single cross-impact of EVENT 16-US in Bio/Chem War WHEN IT OCCURS on TREND 1-Loss of Officers to Civ. In the following example, the top row of numbers is used for reference in this discussion; the bottom row of numbers is one set of cross-impact numbers. A diagram of this discussion is on the next page.

Reference Number:	1	2	3	4	5	6	7	8	9	10
Cross-Impact:	16,	1,	1.10,	1.00,	1,	4,	3,	8,	2,	1

The Cross-Impact Number below Reference Number:

- "1" is EVENT 16-US in Bio/Chem War (read E16 in this discussion).
- "2" is TREND 1-Loss of Officers to Civ (read T1 in this discussion).

THE CROSS-IMPACT OF EVENT 16 ON TREND 1:



- "3" is the maximum impact that E16 has on T1, given that E16 occurs in a scenario.
- "4" is the impact of E16 on T1 when the effect finally stabilizes.
- "5" is the number of years after the occurrence of E16 that its impact on T1 first goes above .00. In this case, one year.
- "6" is the number of years after the occurrence of E16 that its impact on T1 reaches its maximum level of 1.10. In this case, four years. The maximum impact is felt three years after the impact first goes above .00.
- "7" is the number of years after the occurrence of E16 that its maximum impact stops. In this case, six years after the event or two years worth of maximum impact.
- "8" is the number of years after the occurrence of E16 that the impact stabilizes. In this case, eight years from the event's occurrence; or two years after the end of maximum impact.
- "9" is either a "1" or "2." If the number is a "1" it refers to the relationship of the EVENT on the TREND as being "expected;" i.e., if the EVENT occurs, one would expect that a deviation in the TREND would occur AND if the EVENT does NOT occur, one would expect an impact in the opposite direction. If the number is a "2" it refers to the relationship of the EVENT on the TREND as being "baseline;" i.e., if the EVENT occurs one would expect that a deviation in the TREND would occur BUT if the EVENT does NOT occur, one would NOT expect an impact in the opposite direction. In this case, the impact is "baseline."
- "10" is either a "1" or "2." If the number is a "1" it refers to the relationship of the EVENT on the TREND as being "multiplicative;" i.e., if the EVENT occurs, one would multiply the impacts (reference numbers "3" and "4," above) by the nominal TREND values. If the number is a "2" it refers to the relationship of the EVENT on the TREND as being "additive;" i.e., if the EVENT occurs, one would add the impacts to the nominal TREND values. In this case, the impact is "multiplicative."

The following are the "pre-policy" and "policy changed" cross-impacts to reduce the effects of EVENT 16-US in Bio/Chem War:

<u>PRE-POLICY CROSS-IMPACTS</u>							<u>POLICY CHANGED CROSS-IMPACTS</u>												
16,	33,	.80,	1.10,	0,	0,	1,	3,	2,	1	16,	33,	1.05,	1.00,	0,	1,	2,	4,	2,	1
16,	66,	.80,	1.00,	0,	1,	4,	8,	2,	1	16,	66,	.95,	1.00,	0,	1,	2,	4,	2,	1
16,	74,	1.40,	1.00,	1,	3,	7,	12,	2,	1	16,	74,	Delete this cross-impact							
16,	78,	.80,	1.10,	0,	0,	0,	2,	2,	1	16,	78,	1.10,	1.00,	0,	1,	2,	4,	2,	1
16,	82,	.75,	1.0,	0,	0,	2,	4,	2,	1	16,	82,	1.05,	1.00,	0,	1,	2,	4,	2,	1

The following are adjustments in nominal TREND values to reduce the effects of EVENT 16:

- In 1986 multiply TREND-11 by 1.10 and continue effect to end of scenario.
- In 1986 multiply TREND-12 by 1.10 and continue effect to end of scenario.
- In 1986 multiply TREND-14 by 1.05 and continue effect to end of scenario.

The following are adjustments in nominal EVENT values to reduce the effects of EVENT 16:

- In 1988 multiply EVENT-13 by .90 and continue effect to end of scenario.
- In 1988 multiply EVENT-16 by .75 and continue effect to end of scenario.
- In 1990 multiply EVENT-27 by 1.05 and continue effect to end of scenario.

## Graphs of Alternative Future Trends/Performance Measures:

A computer-run of the INTERAX model that produces an "alternative future" scenario gives the analyst a list of events that occurred during the run as well as new trend and performance measure projections which were adjusted by the occurrence of the events. It is, also, possible for trends and performance measures to be adjusted if events do NOT occur in the computer-run. In the presence of the "non-occurrence" of an event, the trend or performance measure will be adjusted by the computer in the opposite direction.

The trend and performance measure information in the print-out is a series of numbers which correspond to their new values for each year in the computer-run. The pages which follow are hand-drawn graphs of selected trends and performance measures.

**UPPER LEFT GRAPH:** This graph of a trend or a performance measure (i.e., a measure of Army success/effectiveness) shows the results of 100 random scenarios run by the computer. The heavy line indicates the arithmetic mean trend for the 100 scenarios. The upper and lower dashed lines show the outer limits which various scenarios achieved. These lines represent the

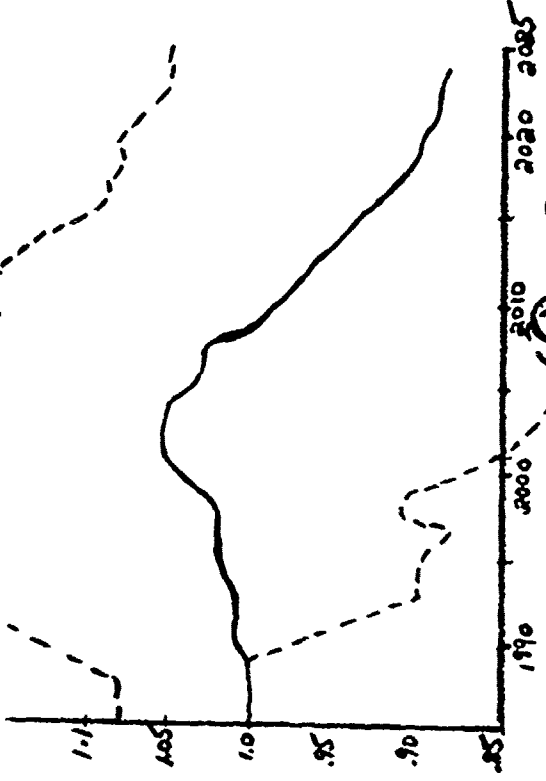
maximum (top line) and minimum (bottom line) trend which a scenario could have taken. It is improbable that a single scenario follows any one of these lines. The computer run which provided data for this graph is called a "statistics run" or "stat run."

Along the x-axis are the years from 1985 to 2025. Along the y-axis are the "index" values. An index value of 1.0 is considered to be the relative value for 1984. The actual value may be expressed as a percentage (e.g., 15-Percentage of Officer Mentoring), a unit of time (e.g., 11-Time to Train Company Grade Officers), a utility of effectiveness (e.g., 16-Combat Readiness of the Conventional Force), a subjective perception of affect (e.g., 66-Army Esprit de Corps), etc. If the real value were known, these trend values could be applied as a multiplier to the real values - multiplying the real number value by the index value.

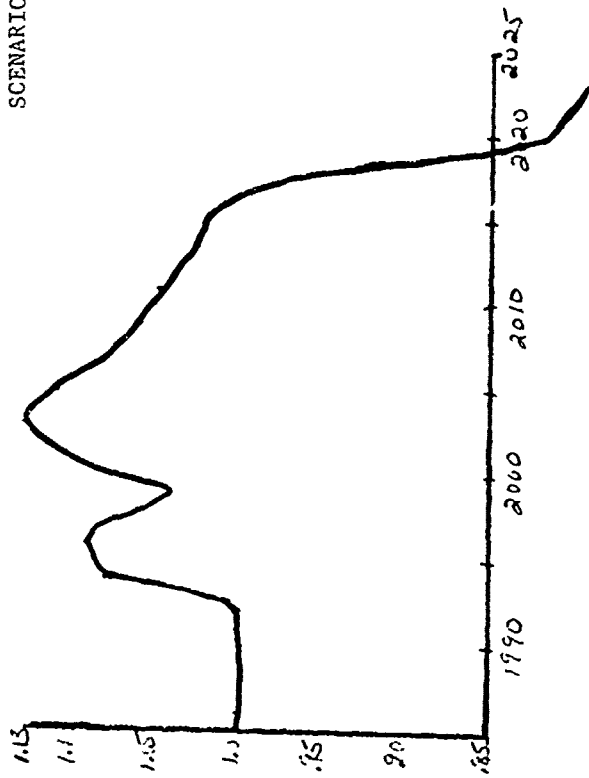
**OTHER GRAPHS:** The other graphs are the trend values for a single alternative future scenario run on the computer (i.e., upper right, scenario 1; lower left, scenario 2; and, lower right, scenario 3).



TREND: 11 Time to Train Company Grade

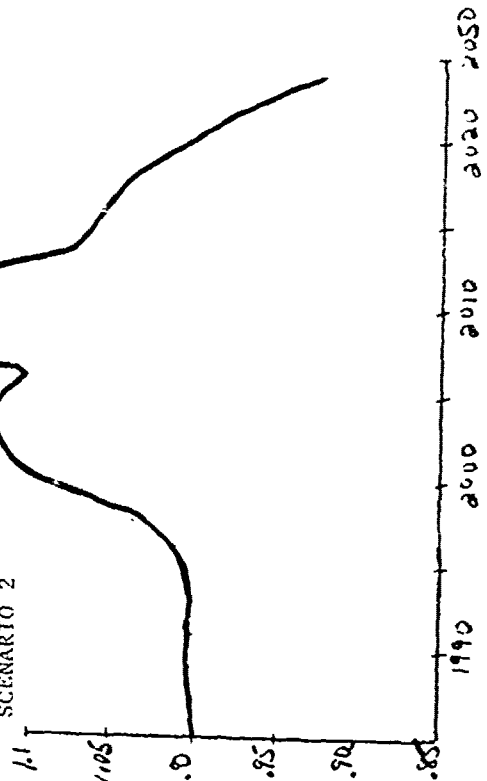


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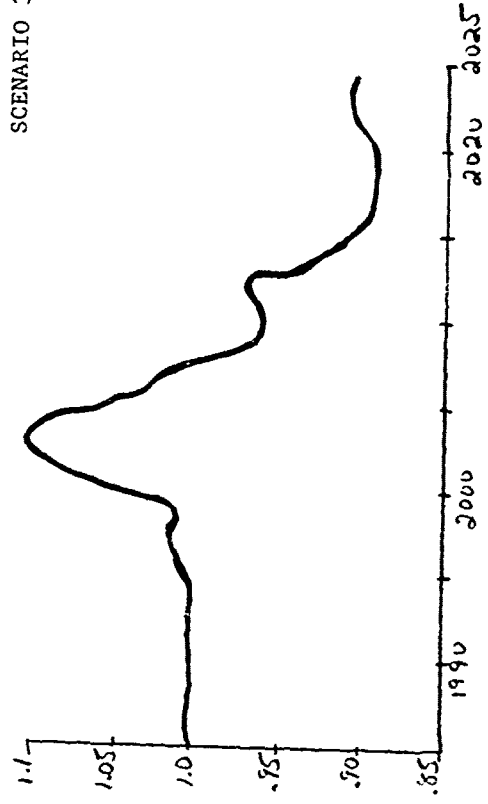


SCENARIO 1

SCENARIO 2

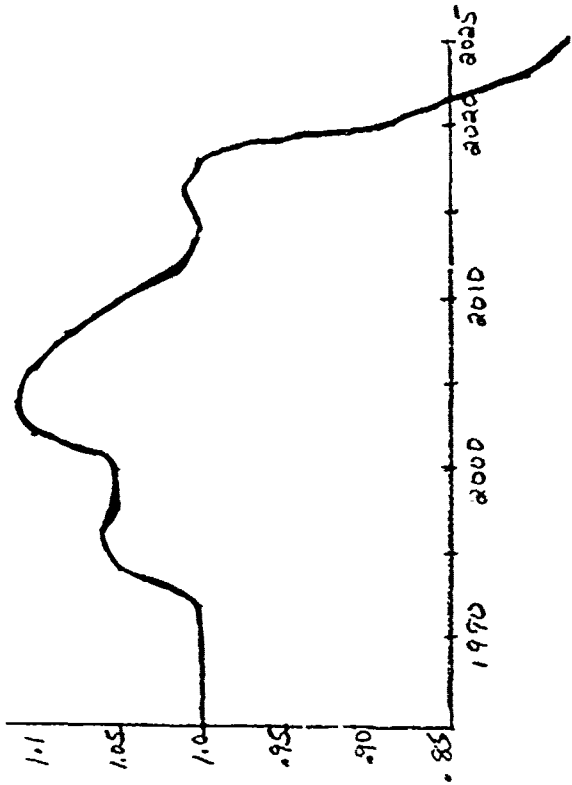


SCENARIO 3

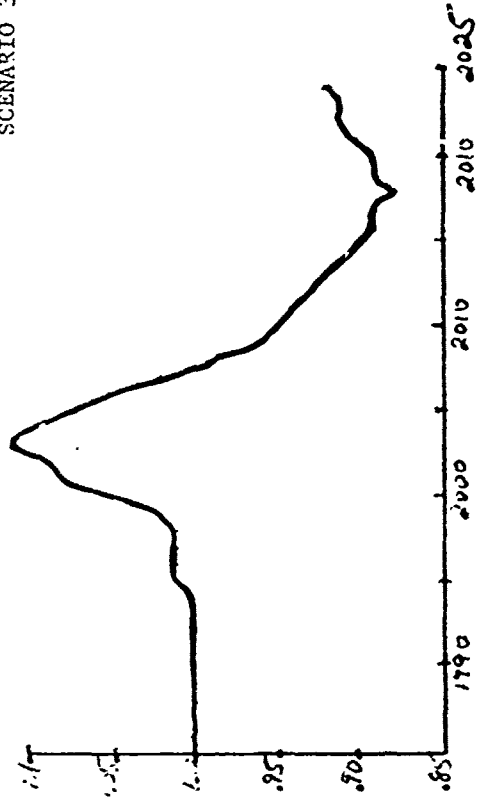


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SCENARIO 1

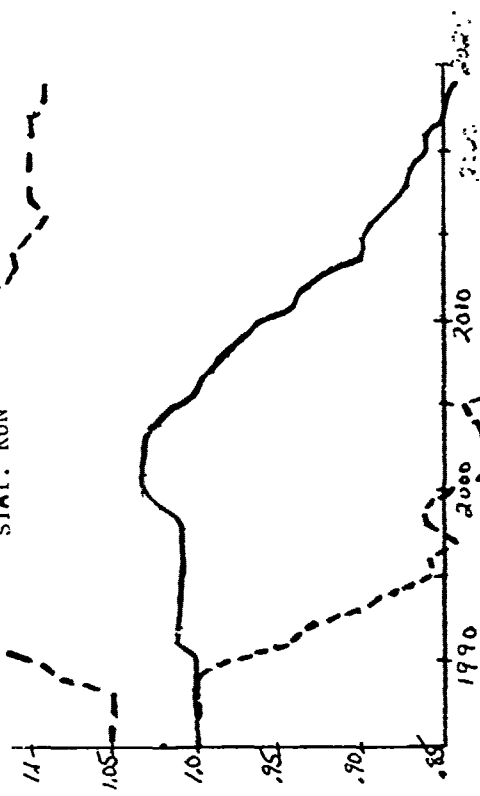


SCENARIO 3

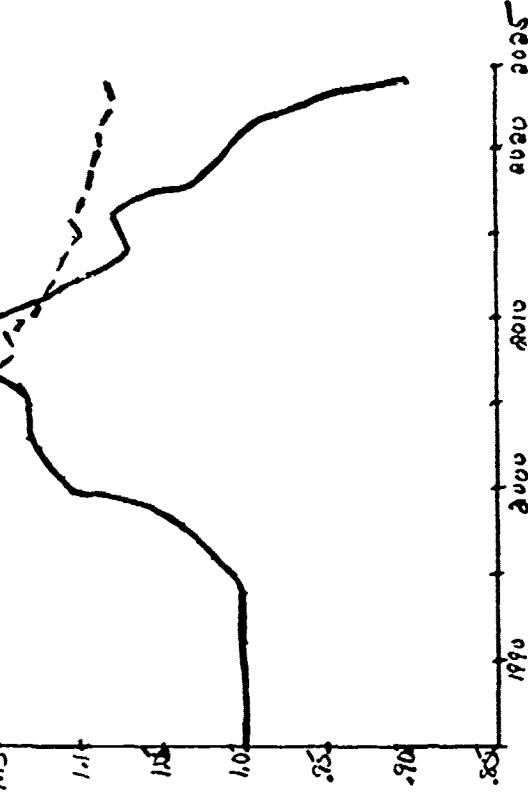


TREND: 12 Time to Train Field Grade

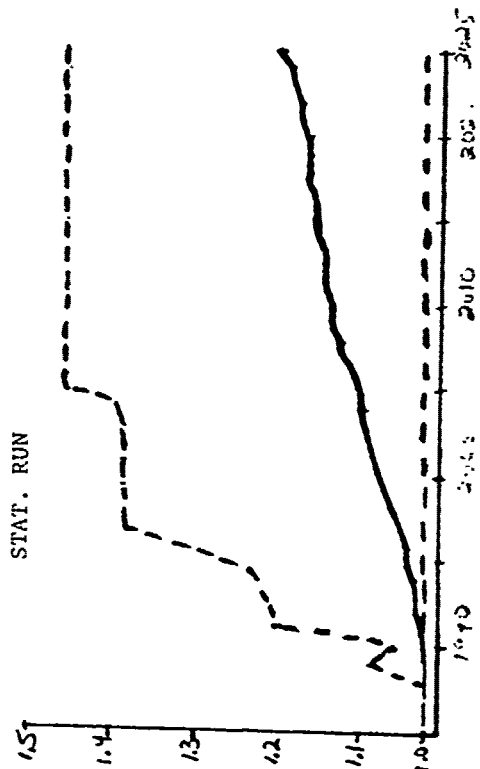
STAT. RUN



SCENARIO 2

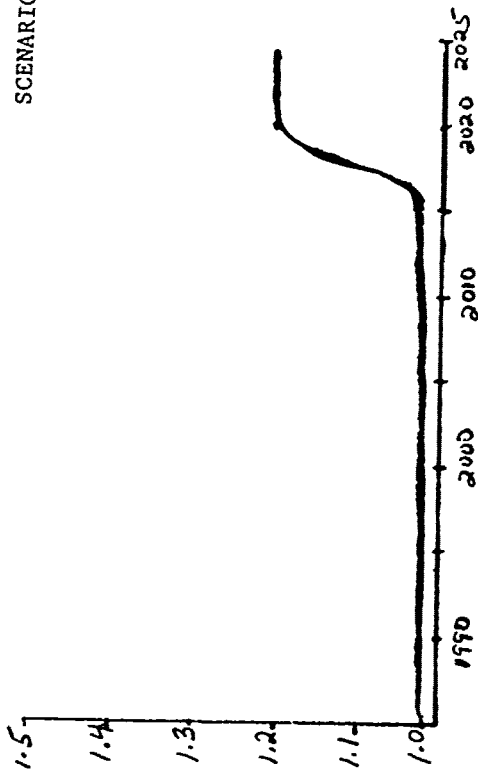


TREND: 15 % Officer Mentoring

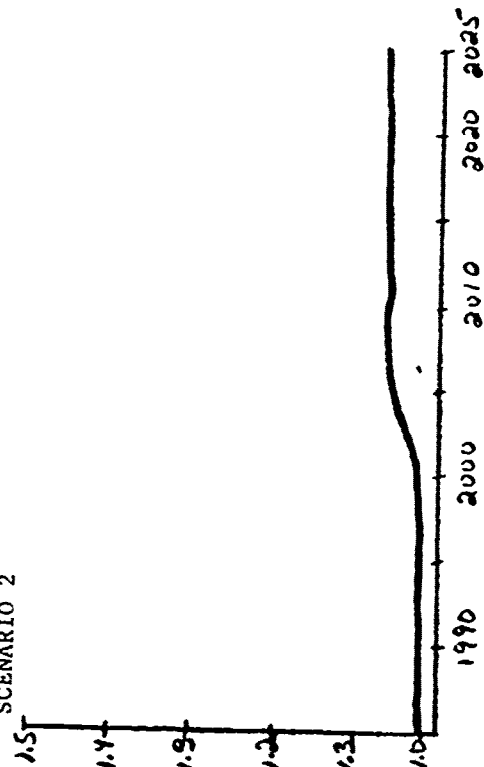


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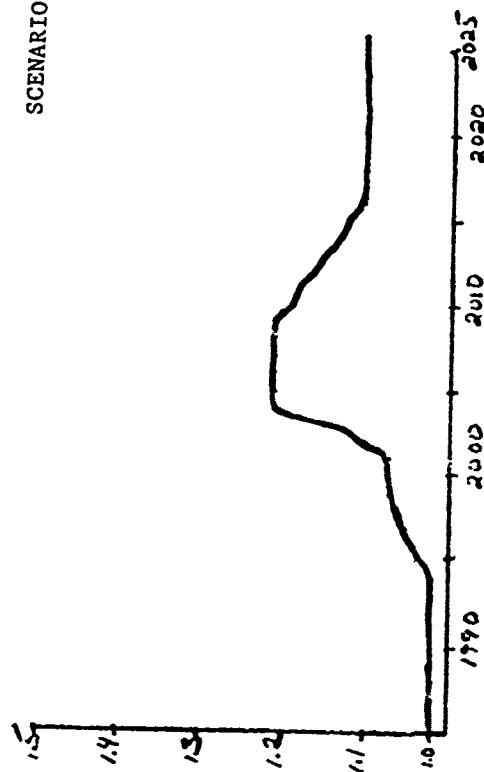
SCENARIO 1



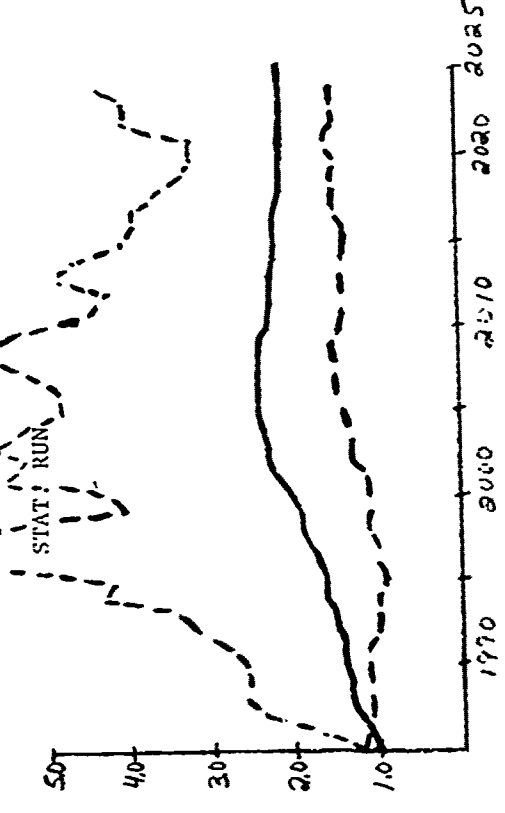
SCENARIO 2



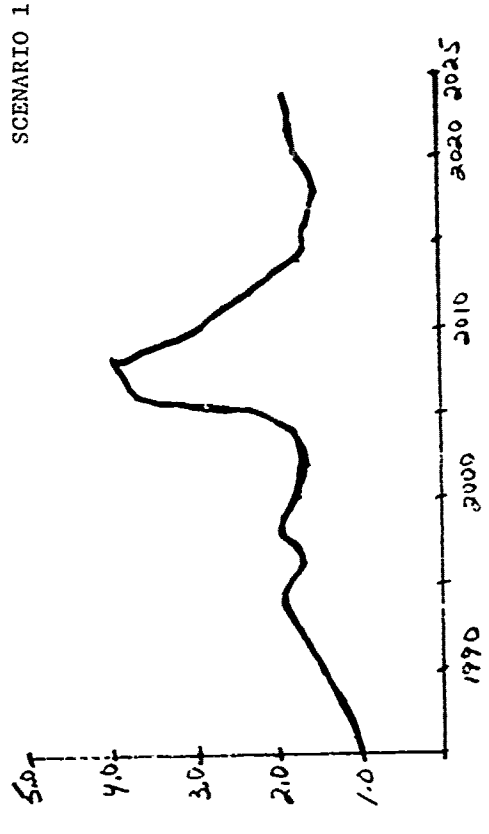
SCENARIO 3



TREND: 16 Combat Readiness/Conv. Force  
 STAT: RUN

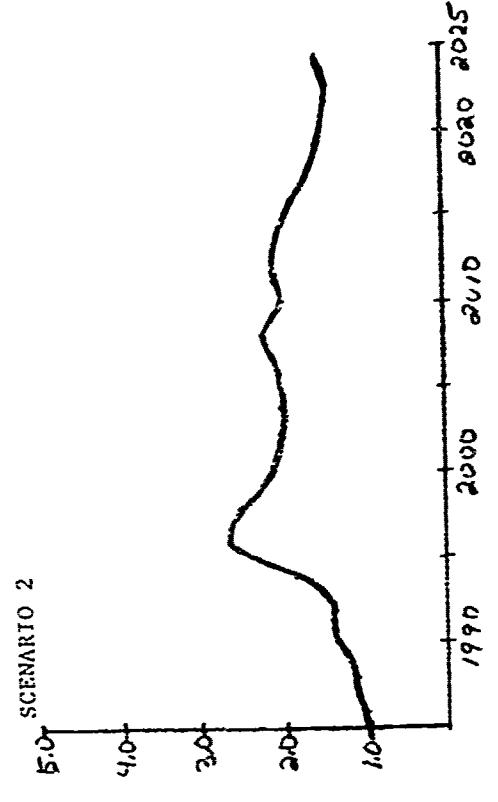


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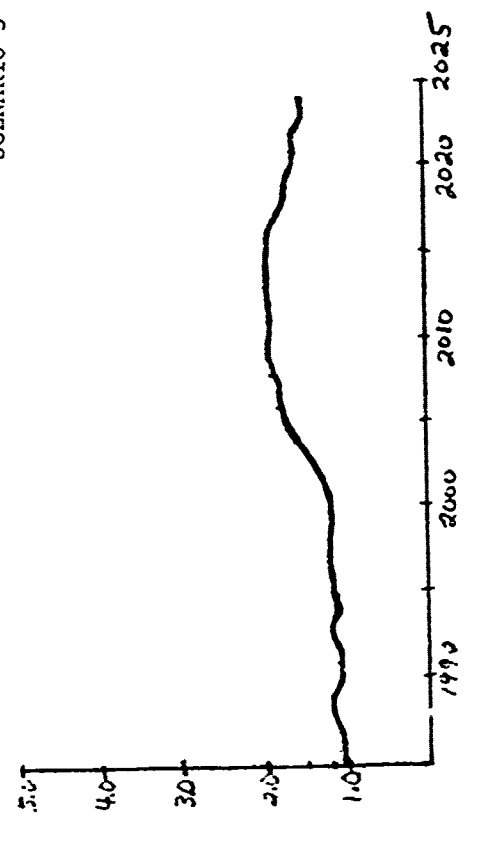


SCENARIO 1

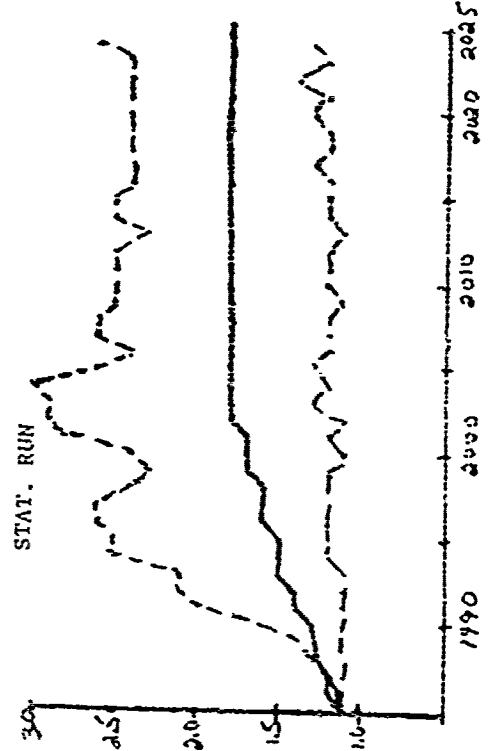
SCENARIO 2



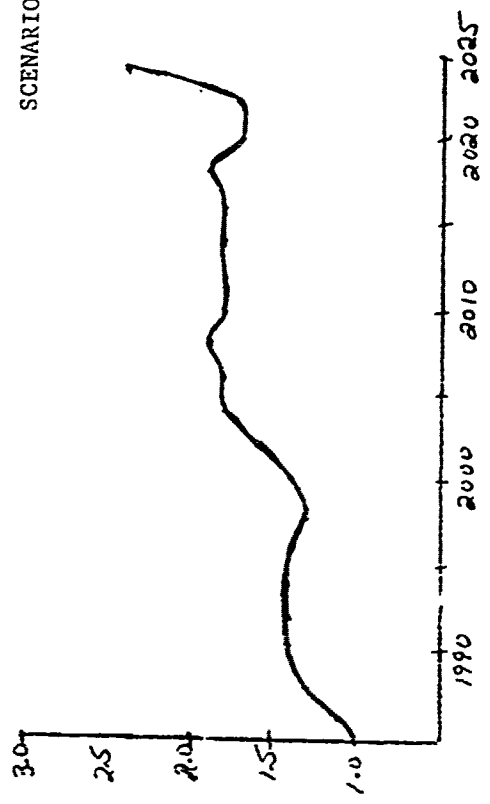
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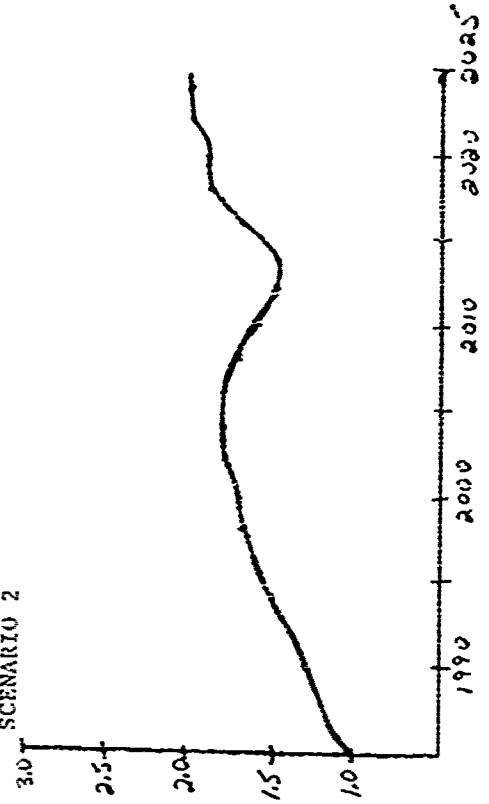
TREND: 20 Officer Retraining Required



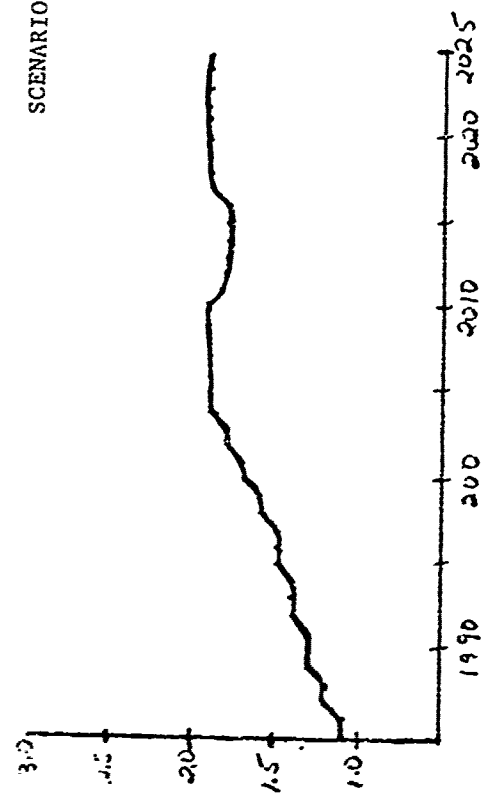
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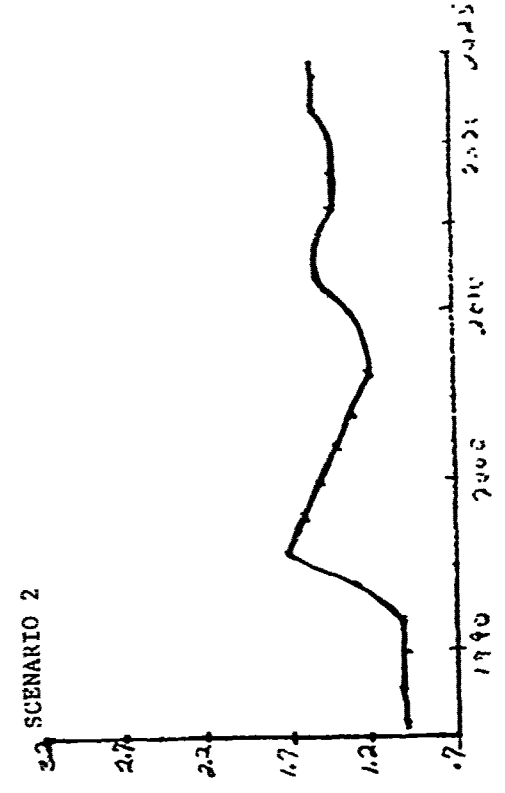
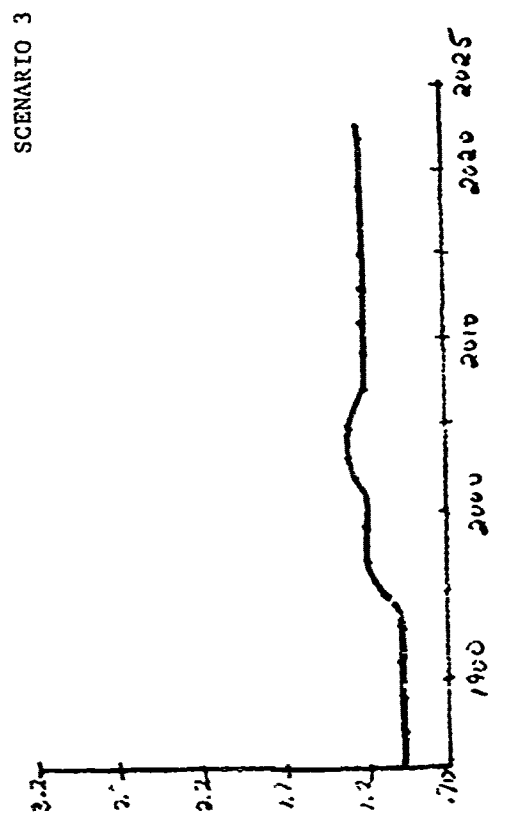
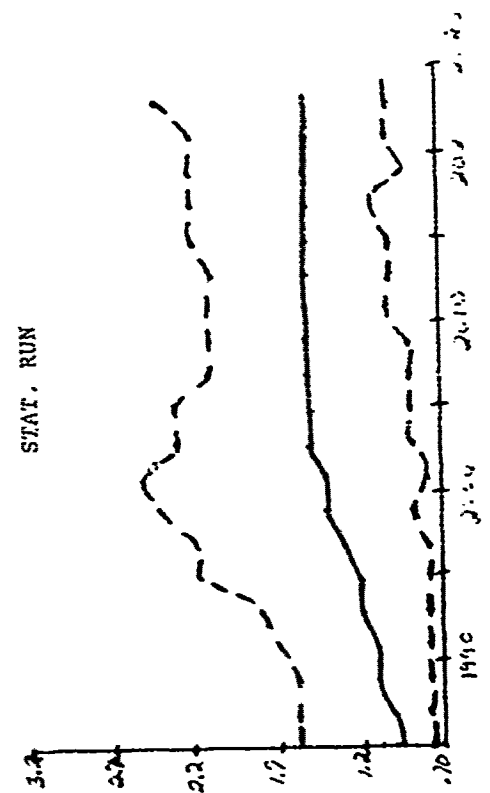
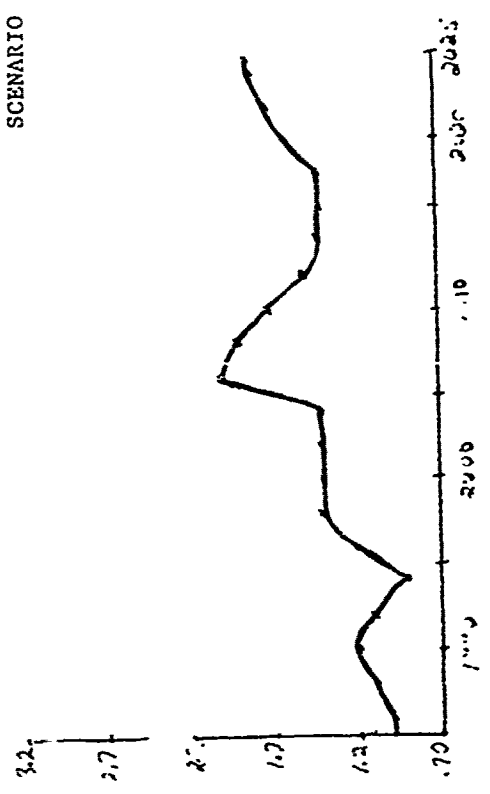
SCENARIO 2



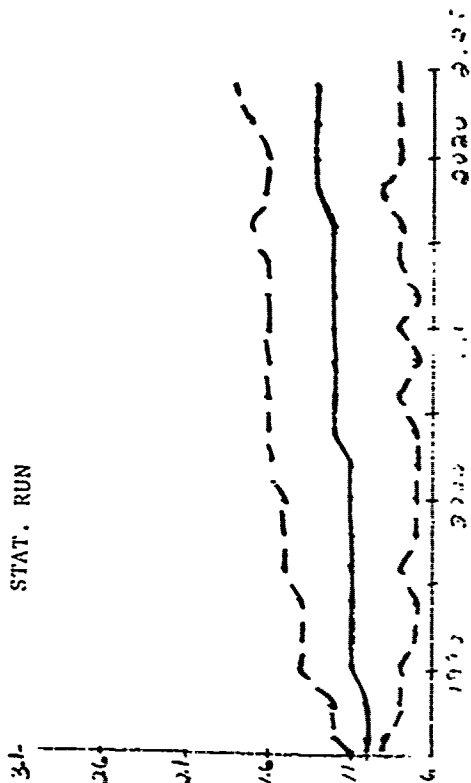
SCENARIO 3



TREND: 33 CDRS Capability in Mid/High Combat  
 (Without Policy)

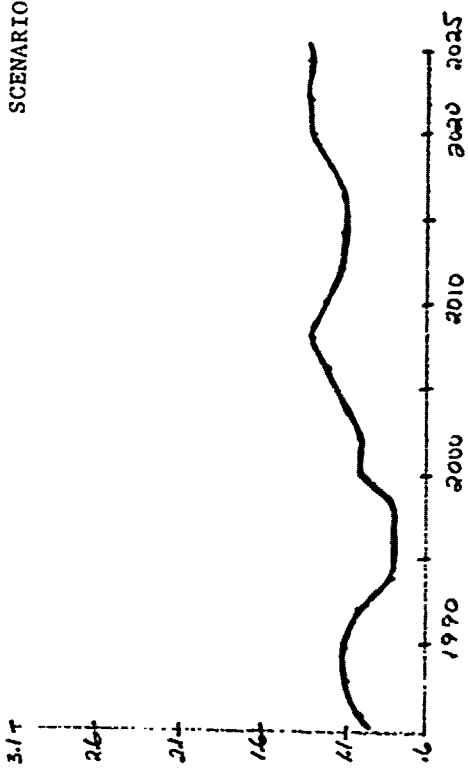


TREND: 66 Army Esprit De Corps

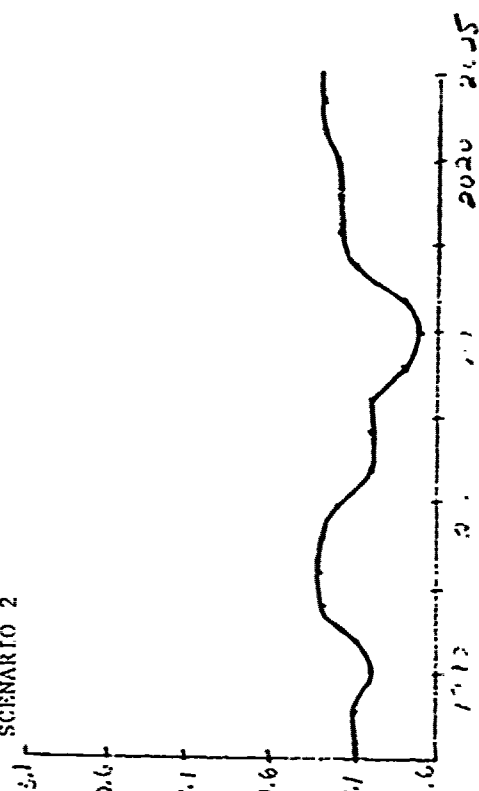


(Without Policy)

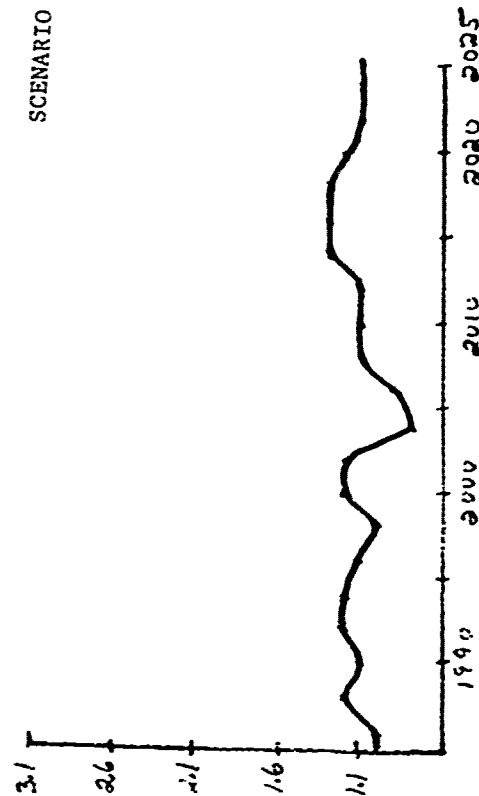
SCENARIO 1



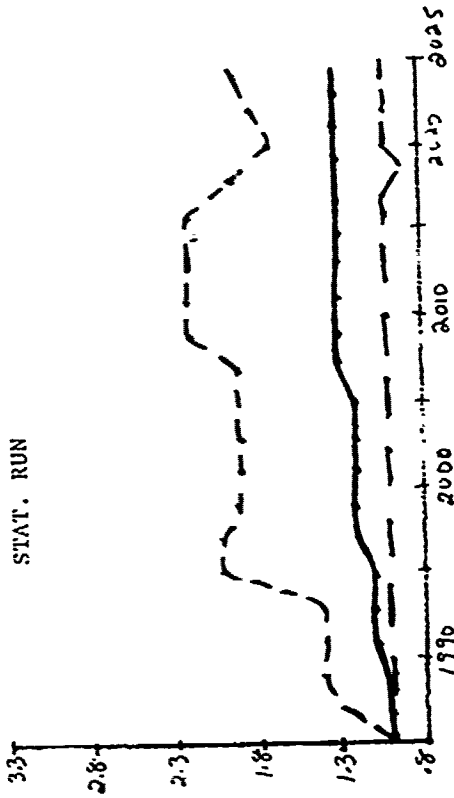
SCENARIO 2



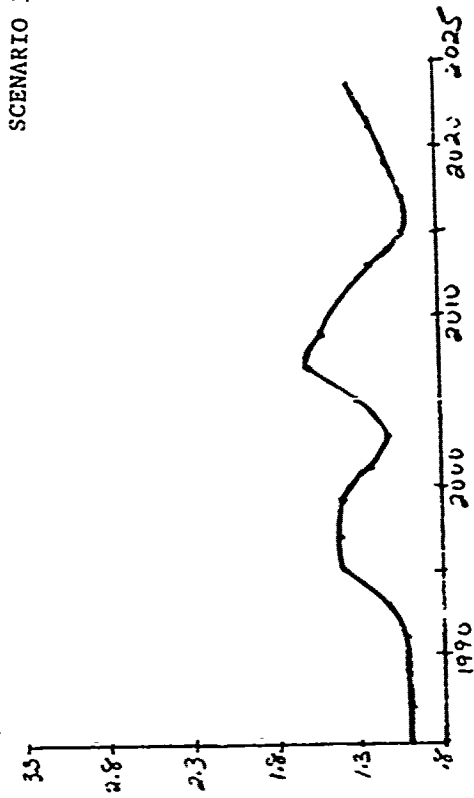
SCENARIO 3



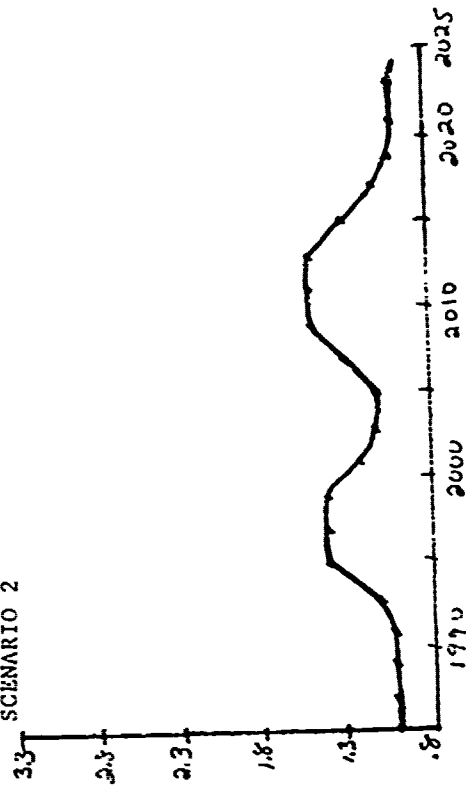
TREND: 74 Threat Officer Proficiency



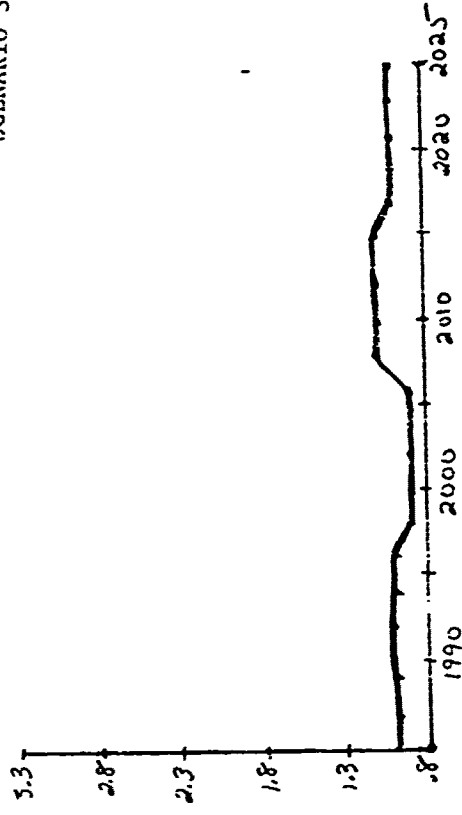
(Without Policy)



SCENARIO 2

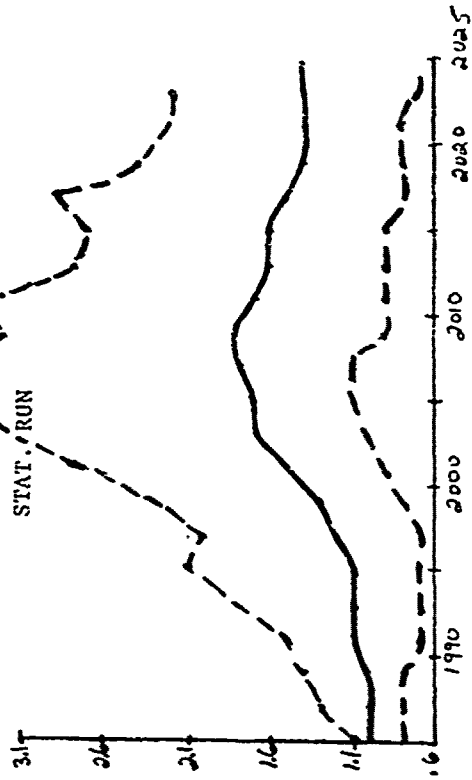


SCENARIO 3

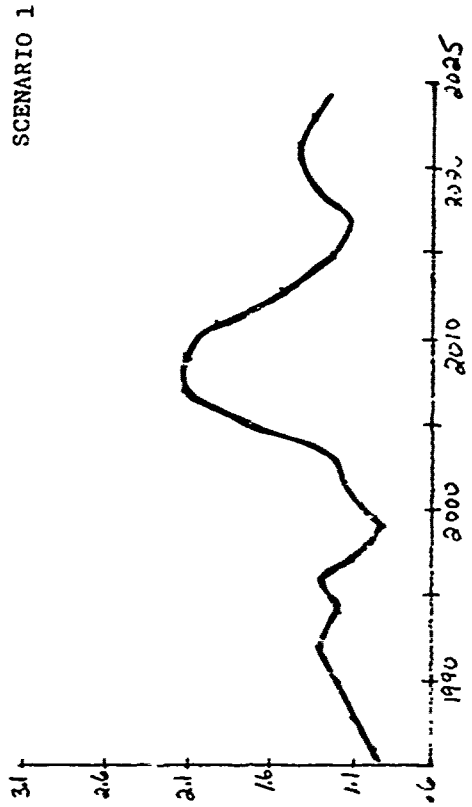




TREND: 78 Army Officer Skill Proficiency

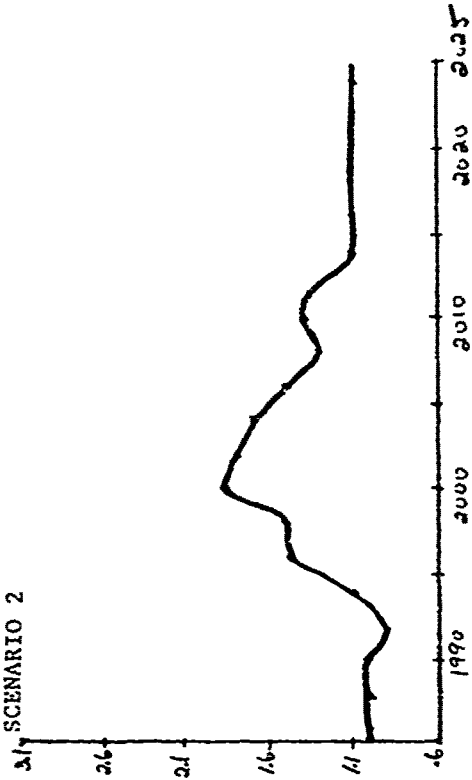


(Without Policy)

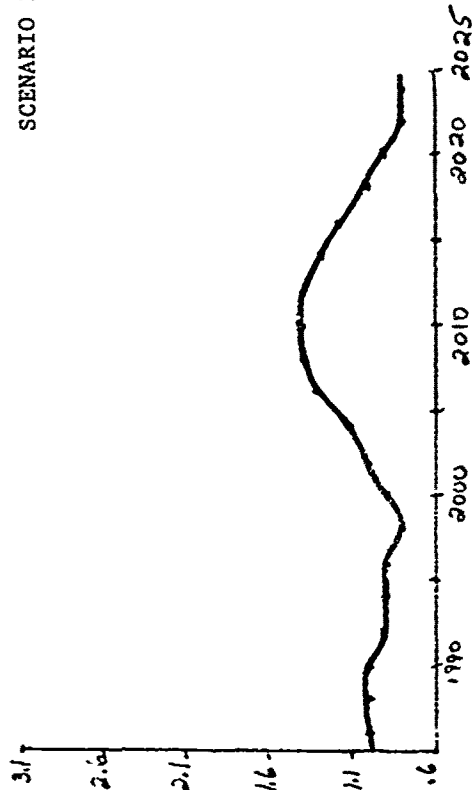


SCENARIO 1

SCENARIO 2

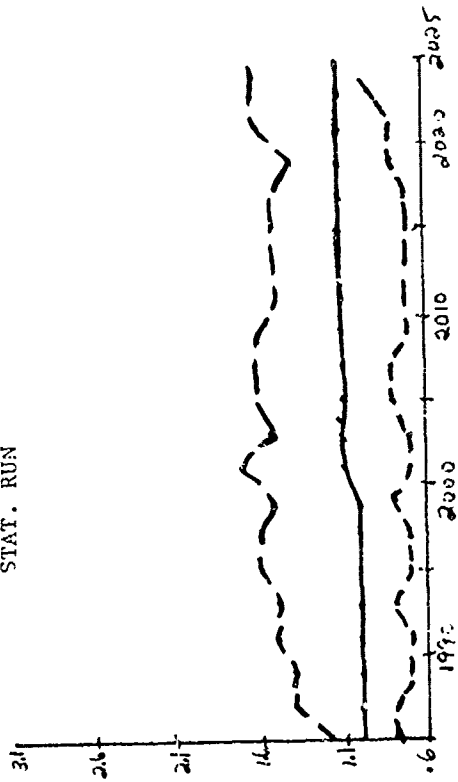


SCENARIO 3

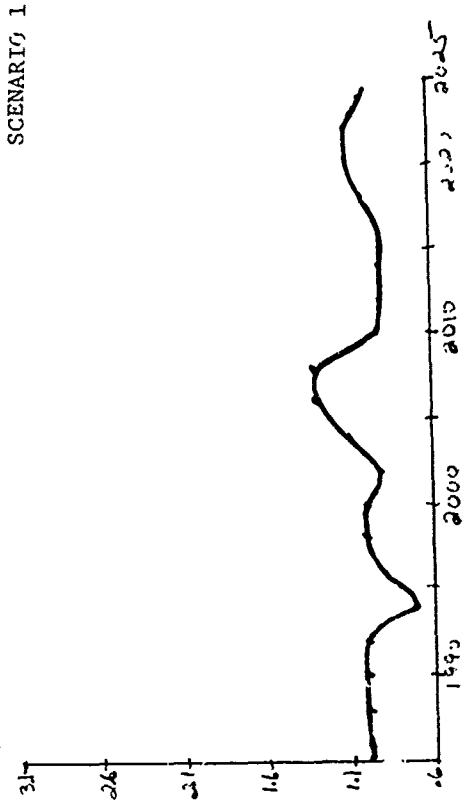


TREND: 82 Competence Under Stress

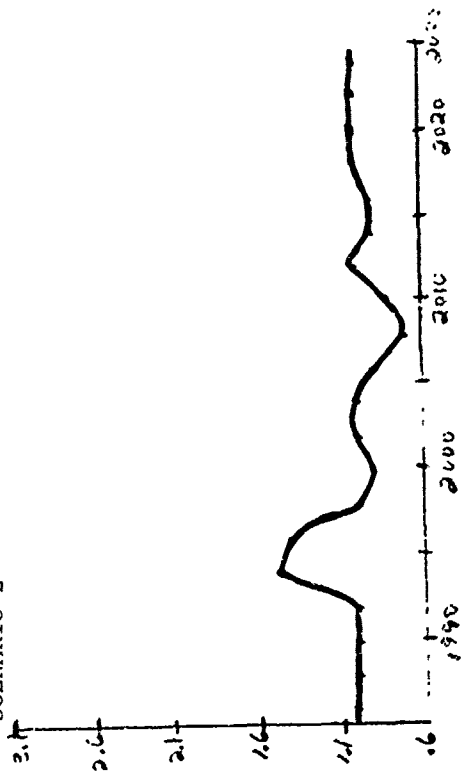
STAT. RUN



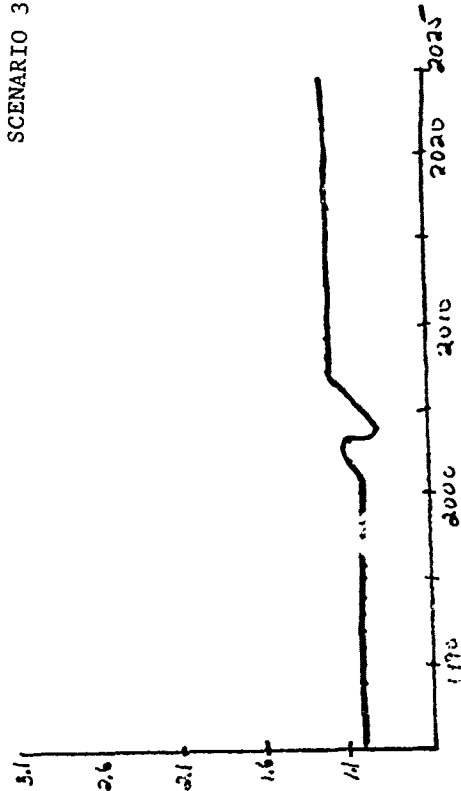
(Without Policy)



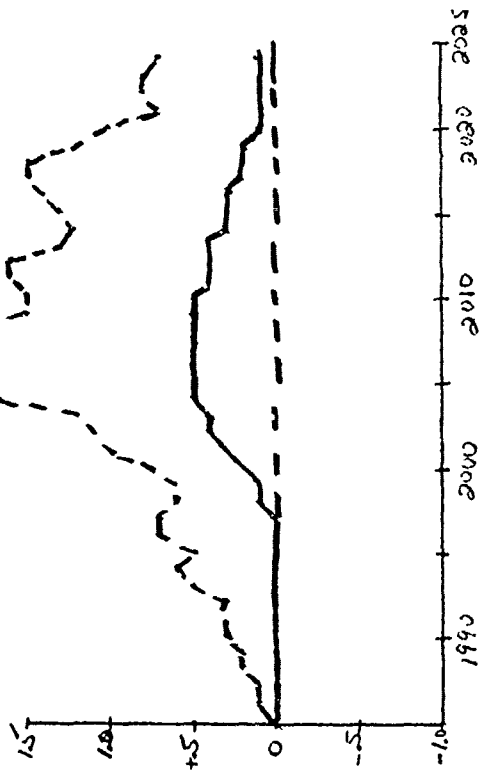
SCENARIO 2



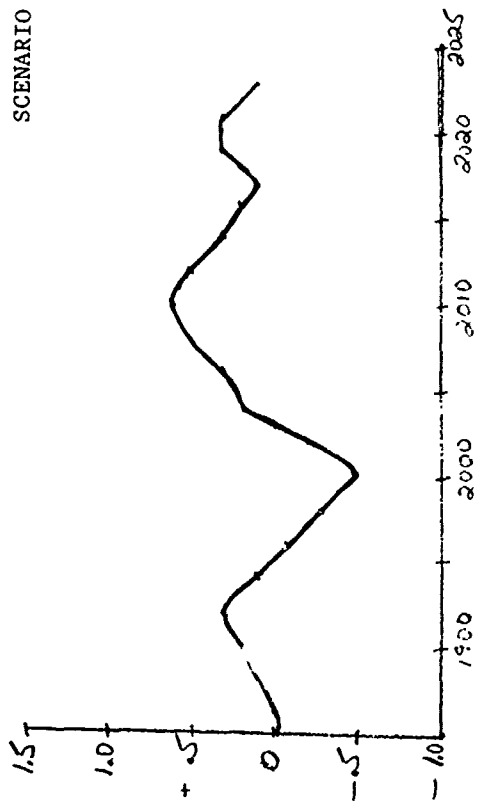
SCENARIO 3



TREND: 83 Army-Threat Skill Proficiency

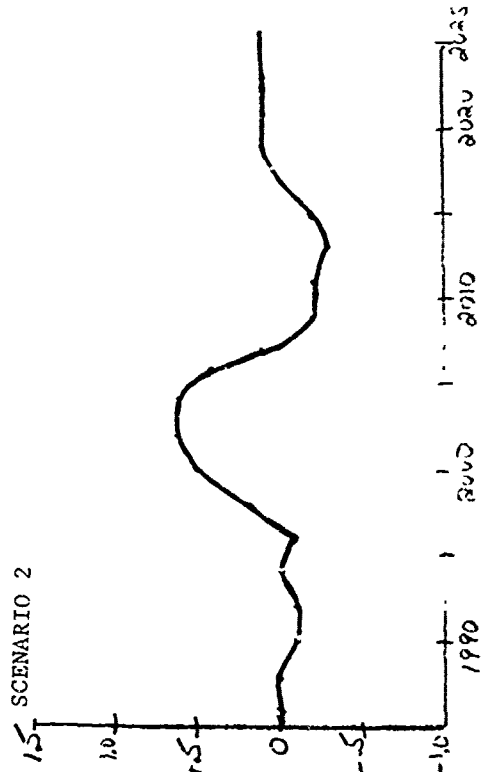


(Without Policy)

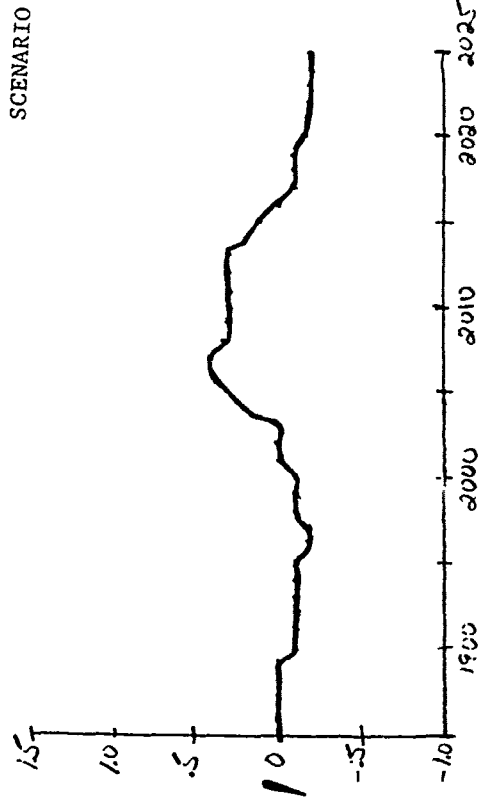


SCENARIO 1

SCENARIO 2



SCENARIO 3

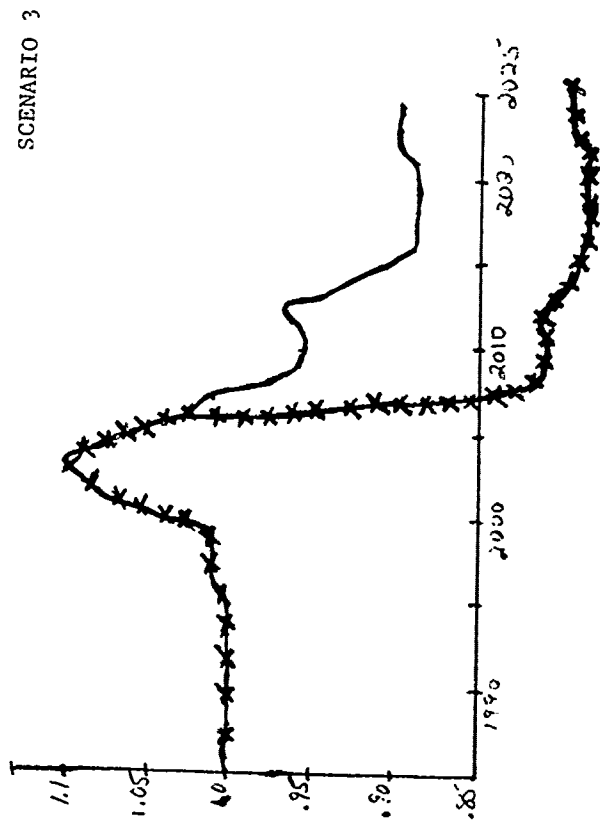
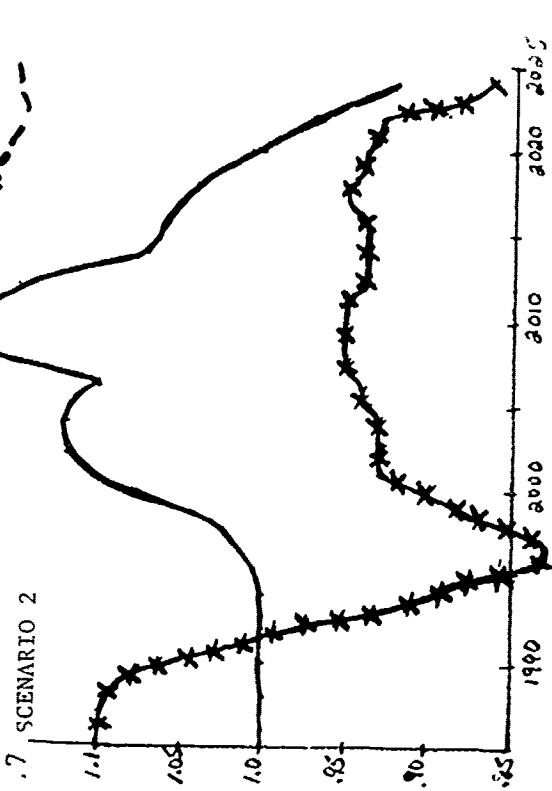
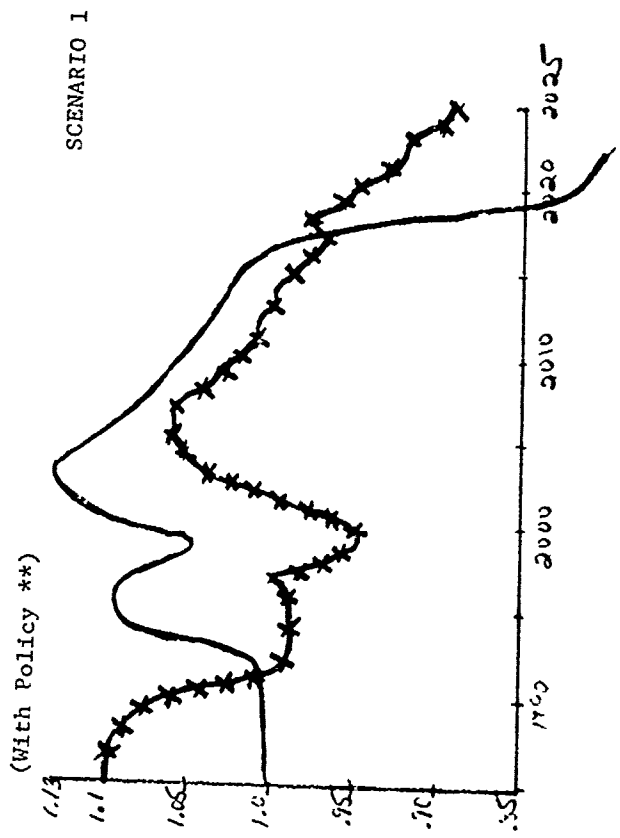
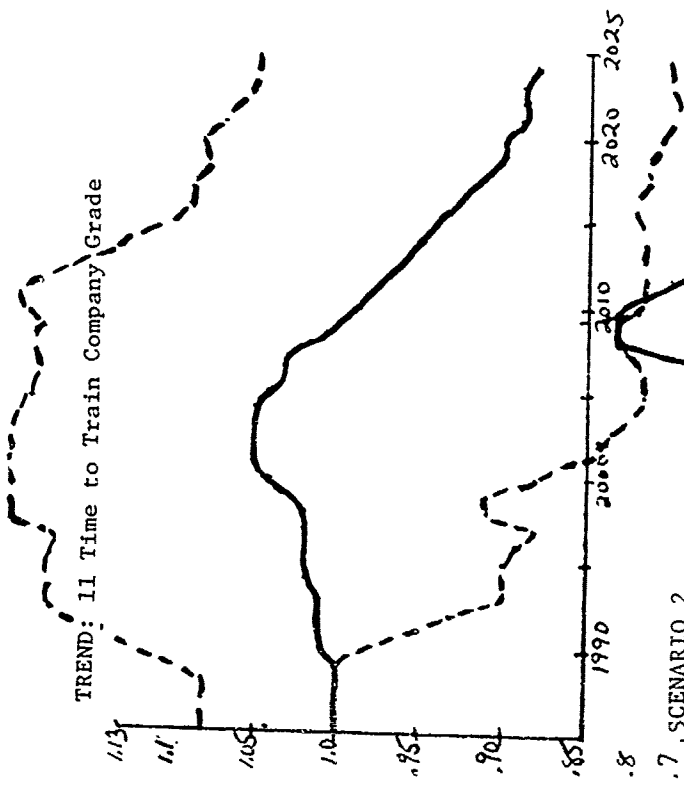


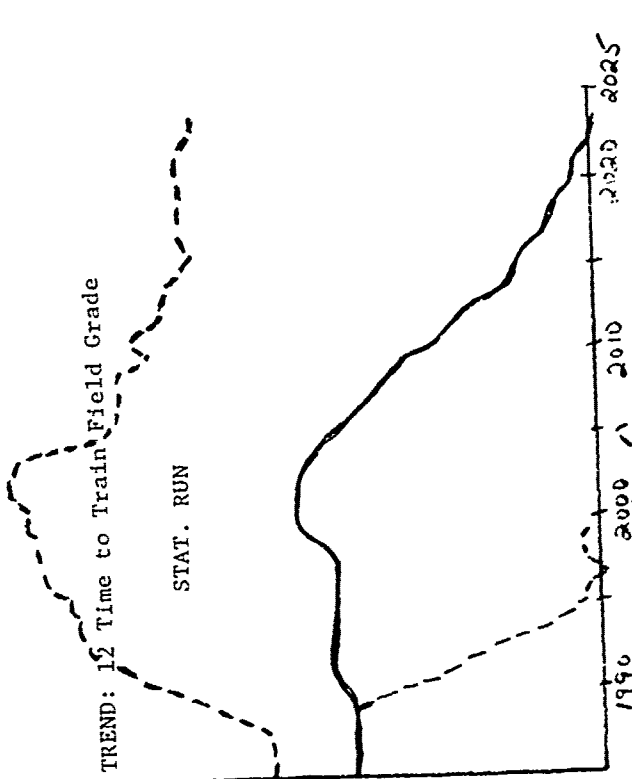
## Description of "Policy Impacted Scenario" Graphs

**UPPER LEFT GRAPH:** This graph is a duplicate of the upper left graph in the "scenario" portion of this book.

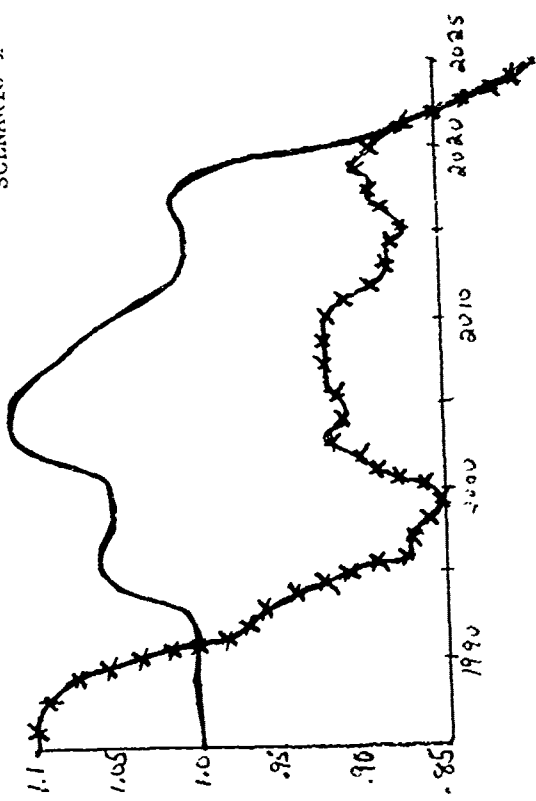
**OTHER GRAPHS:** The other graphs show the trend line (solid line) before policy was applied to

the trend. The "x-ed" line shows the trend value as a result of the impact of the policy. In some cases there was no effect whereas in others the effect was dramatic.

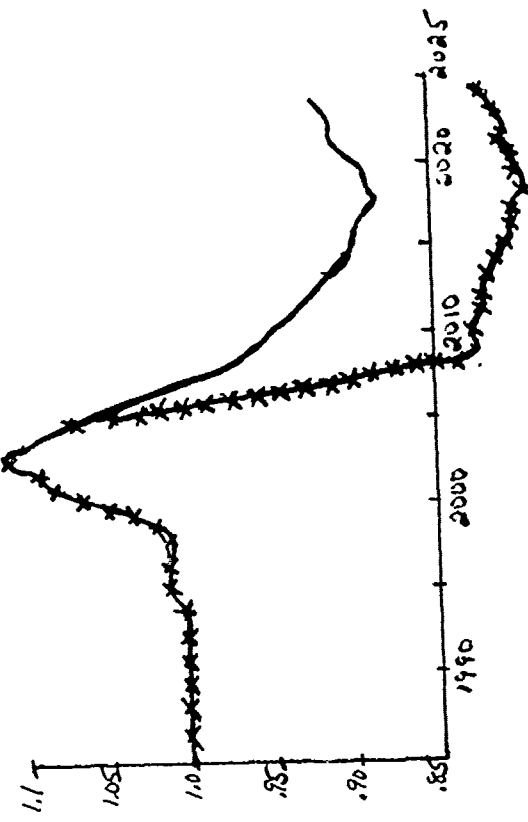




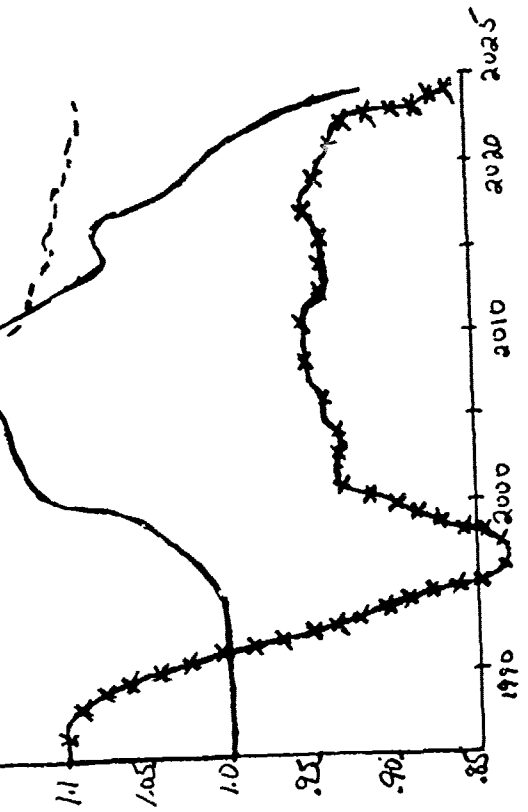
SCENARIO 1  
(With Policy \*\*)



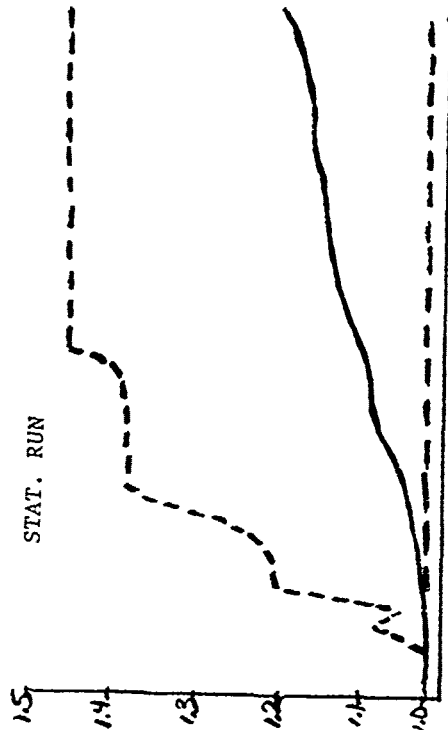
SCENARIO 3



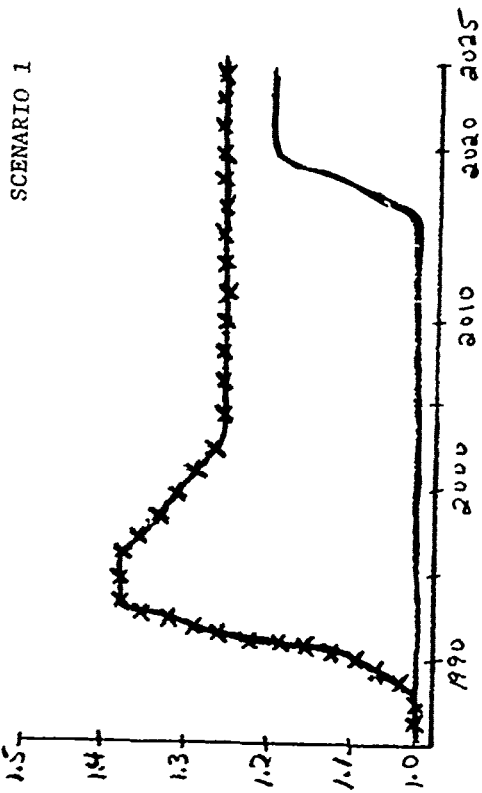
SCENARIO 2



TREND: 15 % Officer Mentoring

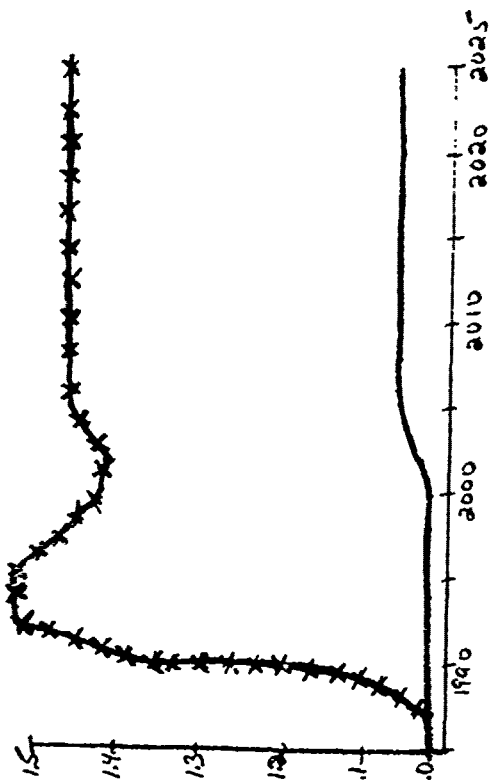


(With Policy \*\*)

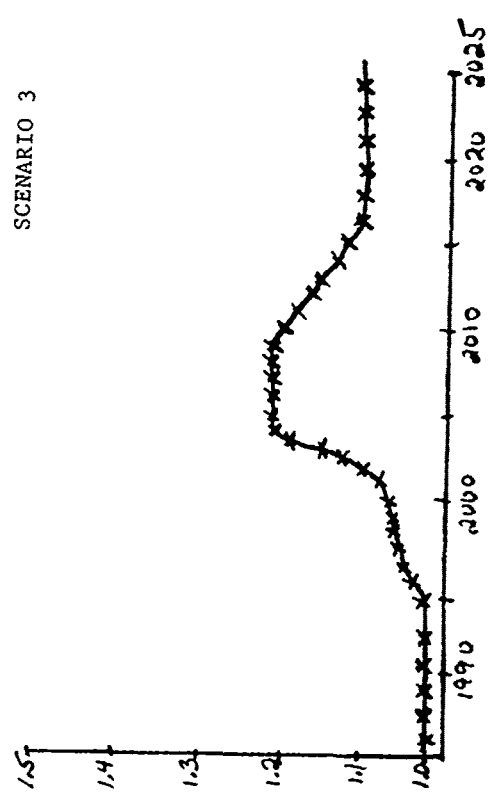


SCENARIO 1

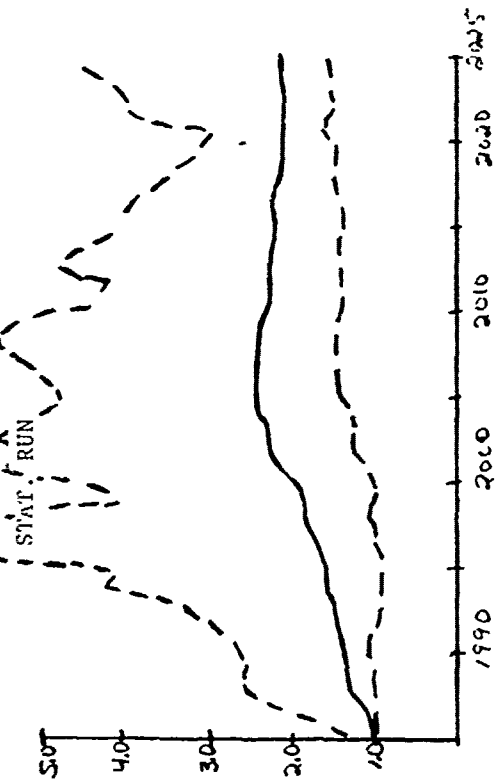
SCENARIO 2



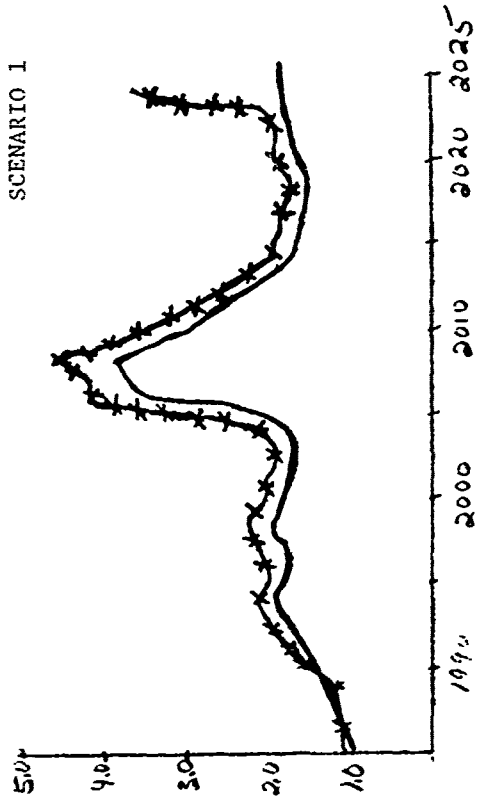
SCENARIO 3



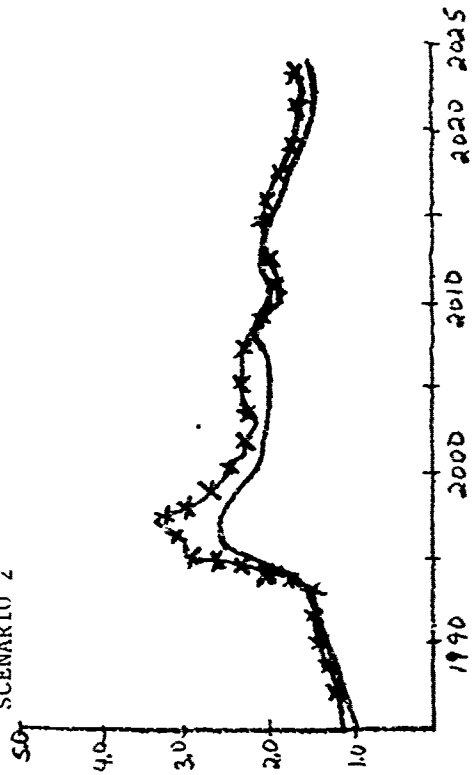
TREND: 16 Combnt Readiness/Conv. Force



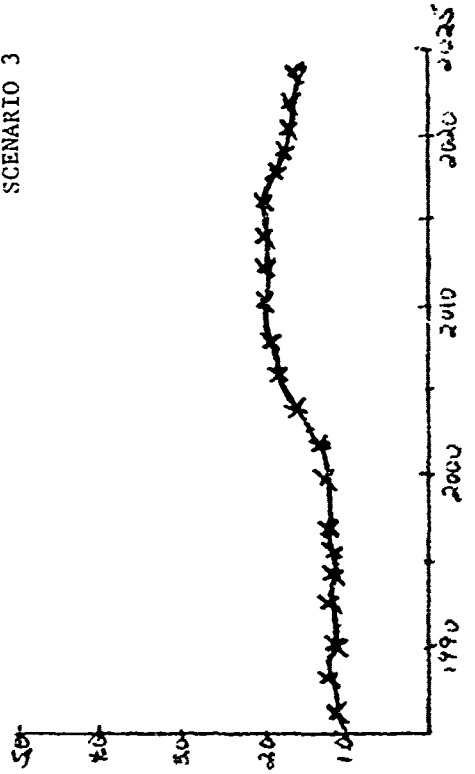
(With Policy \*\*)



SCENARIO 2

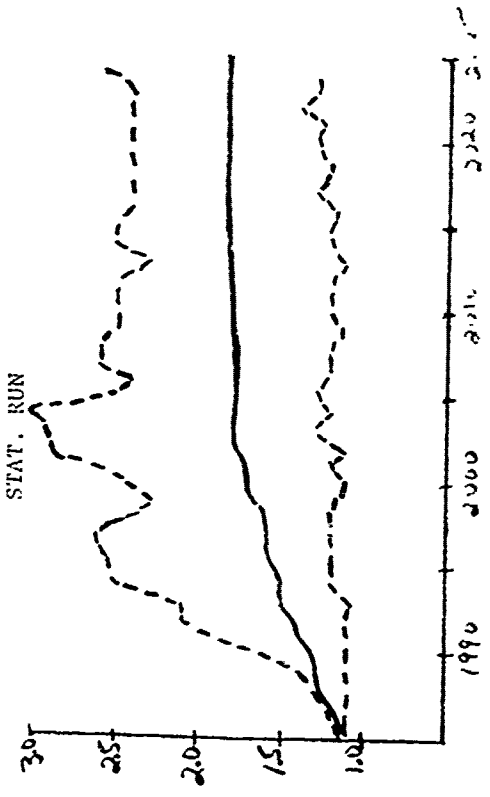


SCENARIO 3

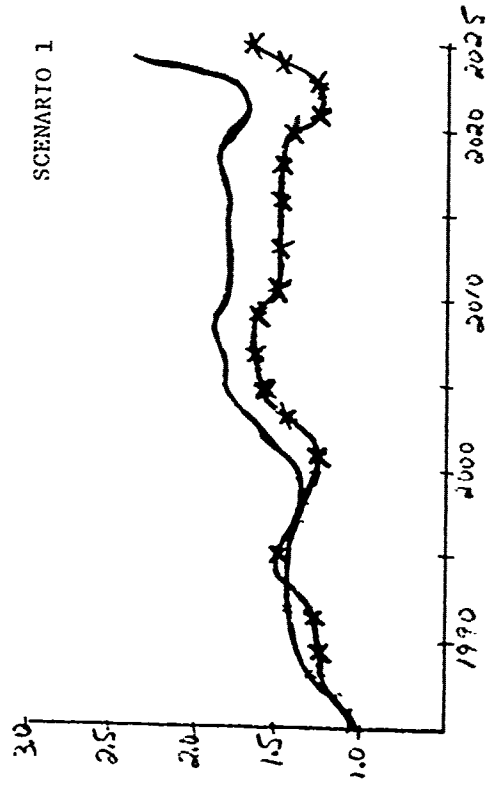




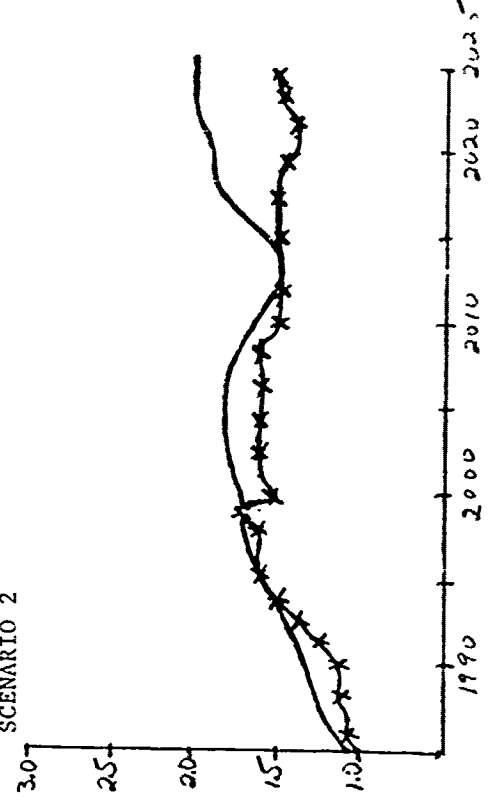
TREND: 20 Officer Retraining Required



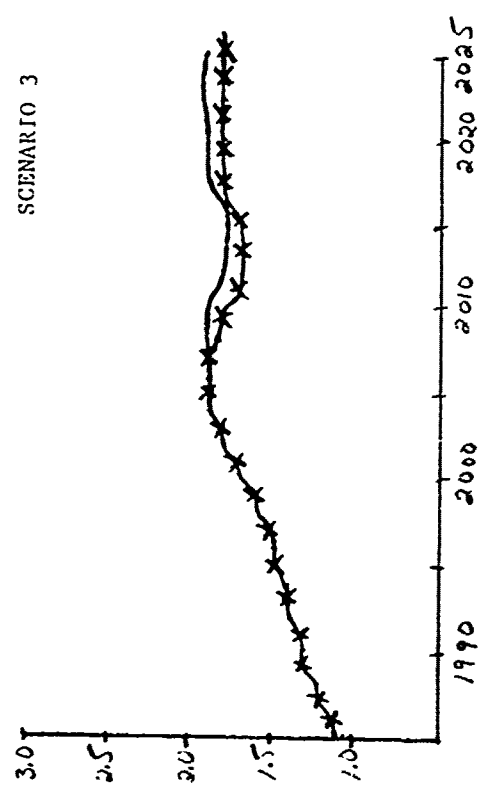
(With Policy \*\*)



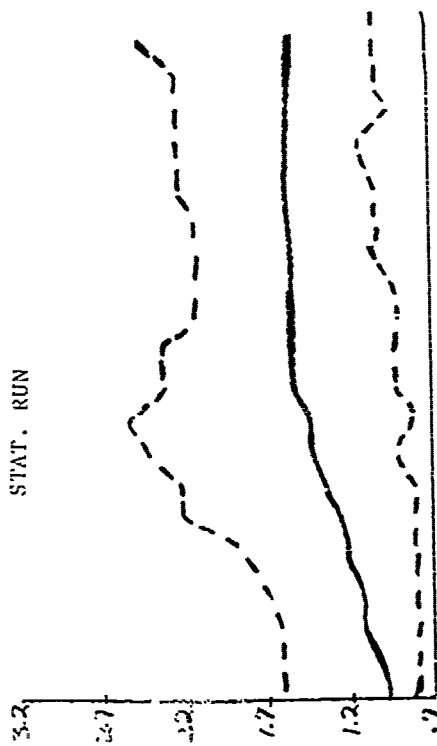
SCENARIO 2



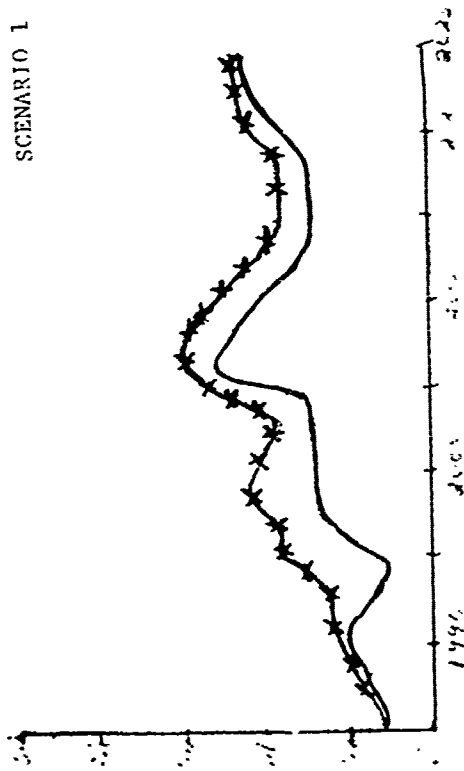
SCENARIO 3



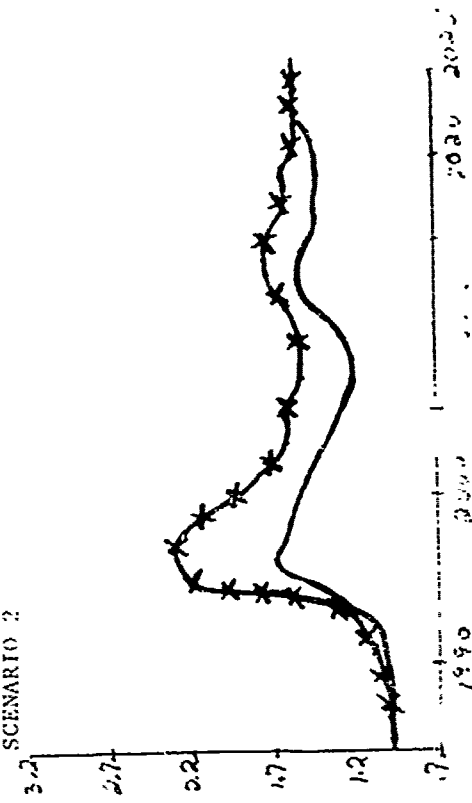
TREND: 33 Cdrs Capability In Mid/High Combat



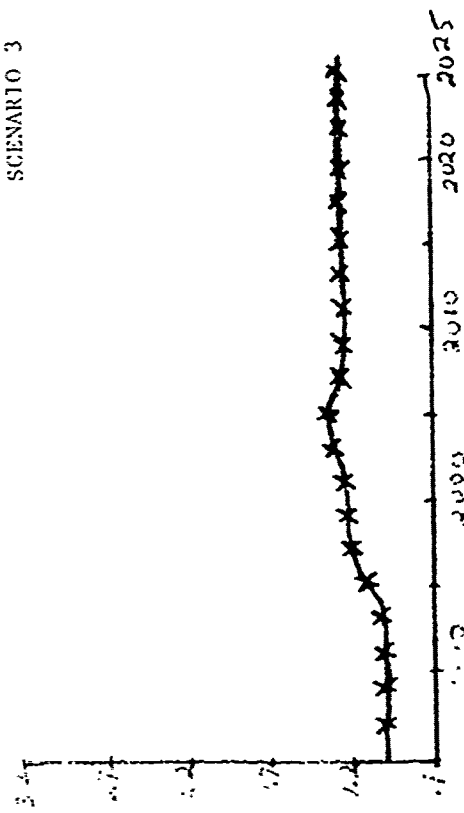
(With Policy \*\*)



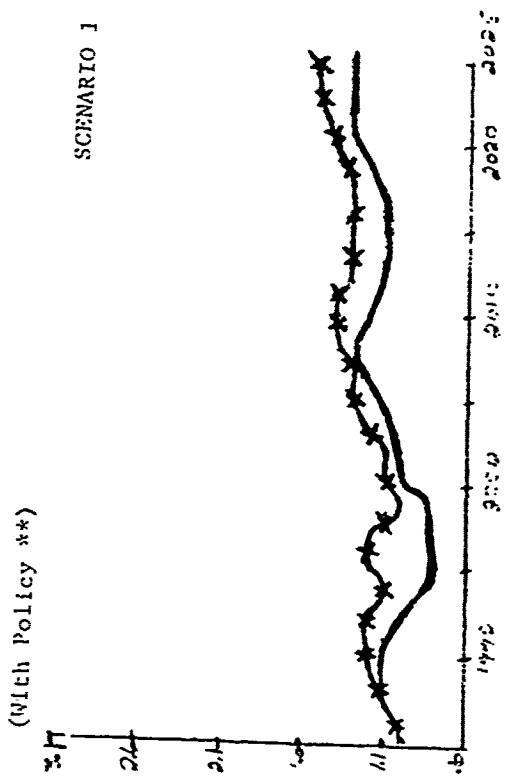
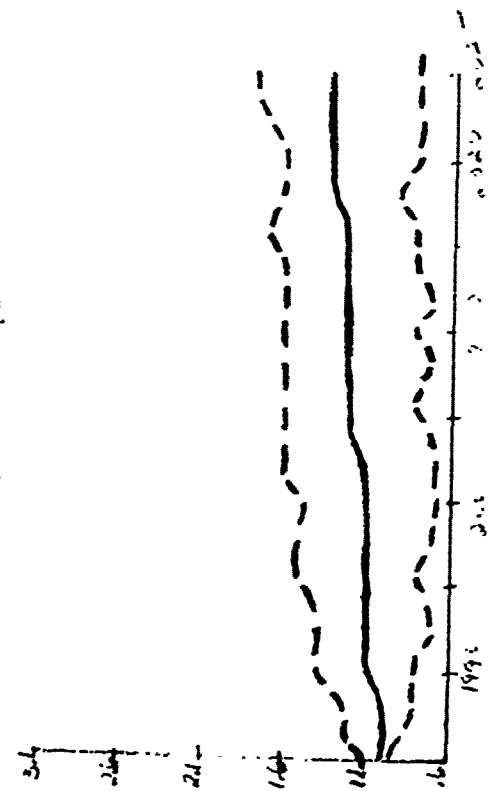
SCENARIO 2



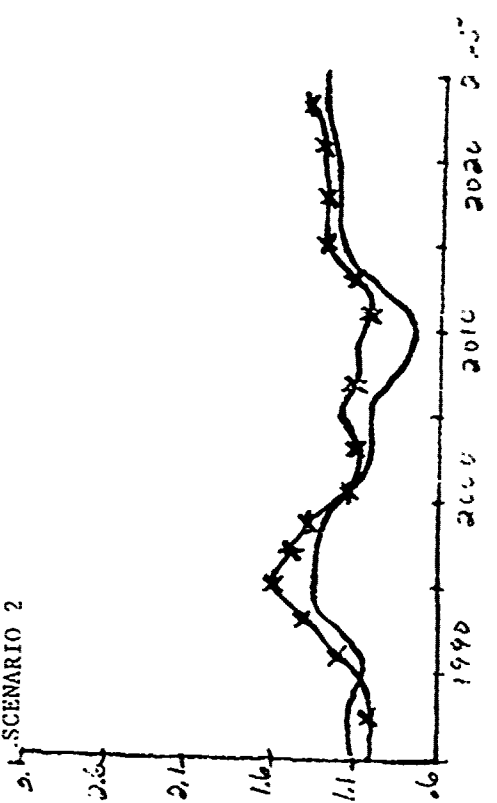
SCENARIO 3



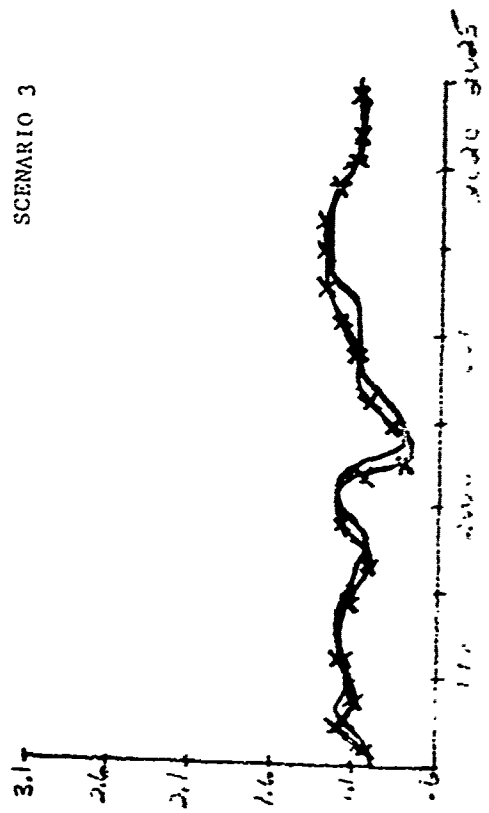
TREND: 66 Army Esprit De Corps



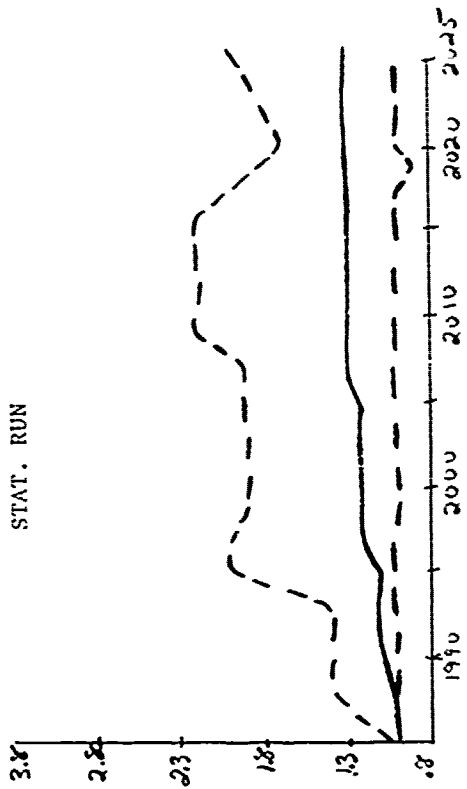
SCENARIO 2



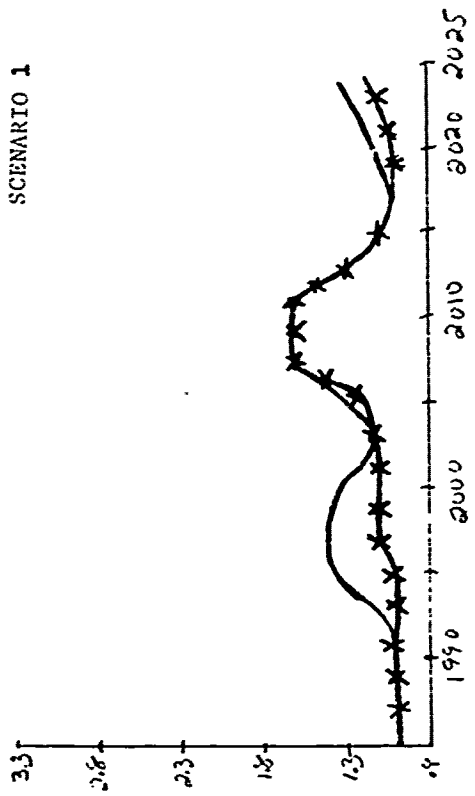
SCENARIO 3



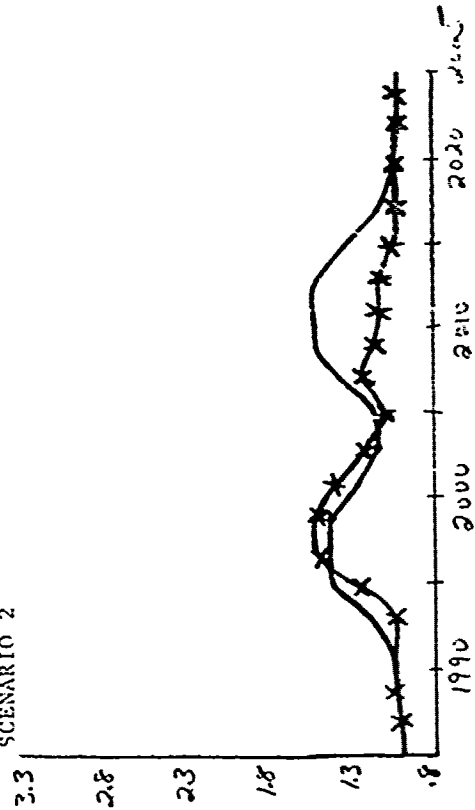
TREND: 74 Threat Officers Proficiency



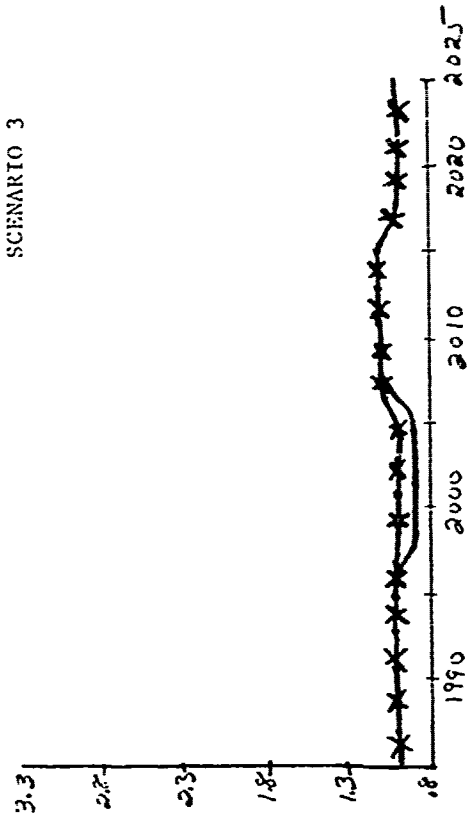
(With Policy \*\*)



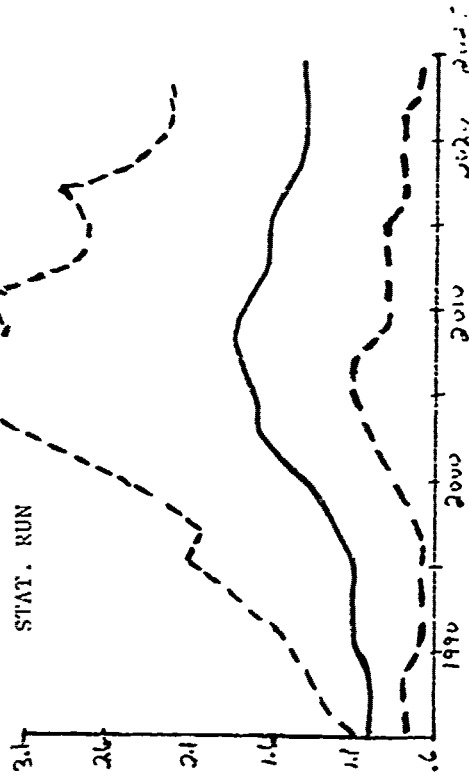
SCENARIO 2



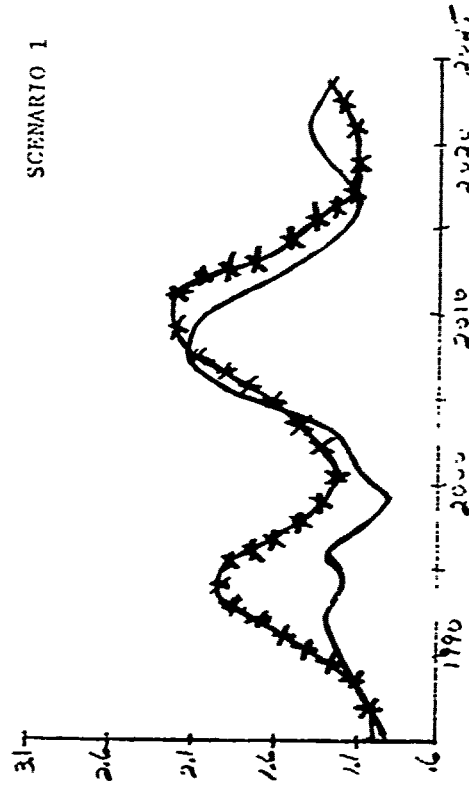
SCENARIO 3



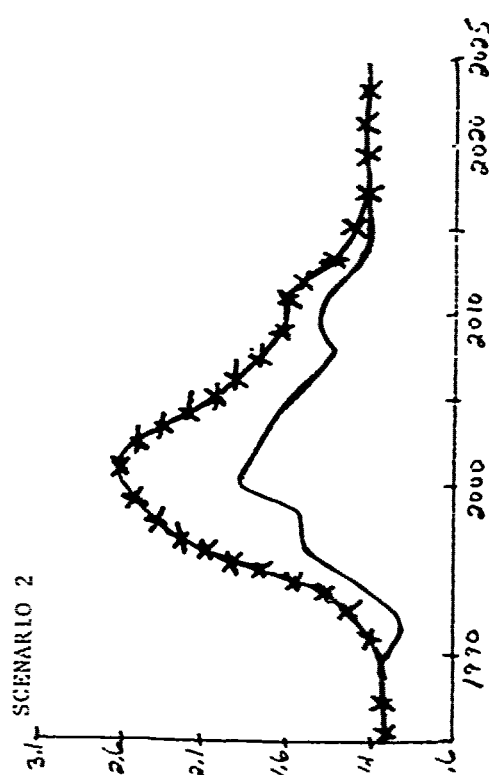
TREND: 78 Army Officer Skill Proficiency



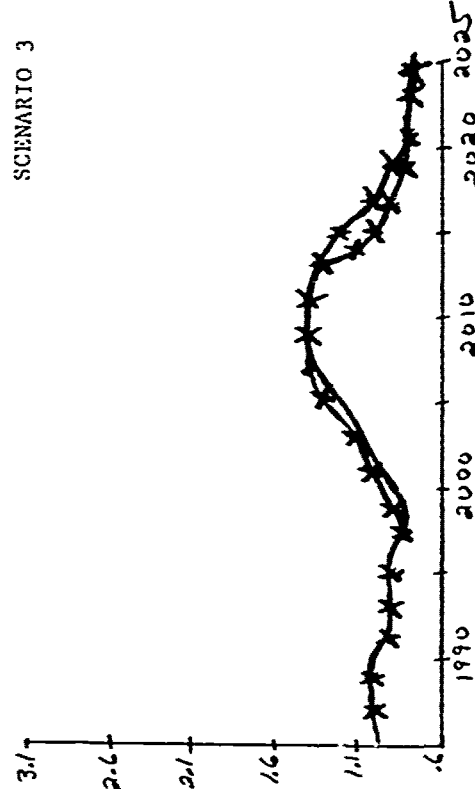
(With Policy \*\*)



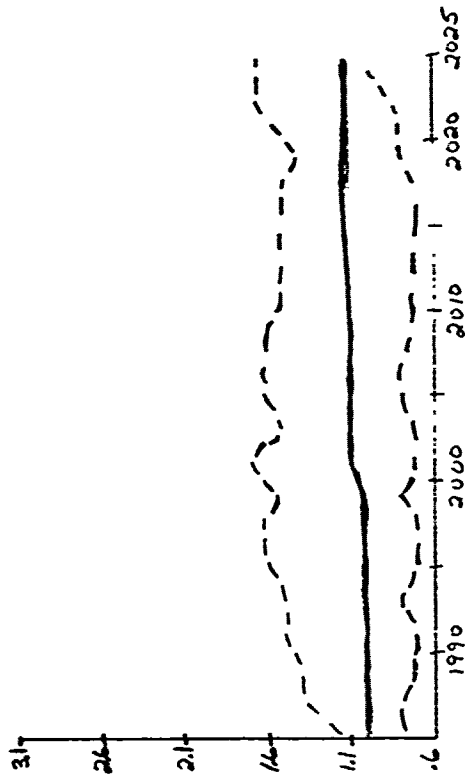
SCENARIO 2



SCENARIO 3

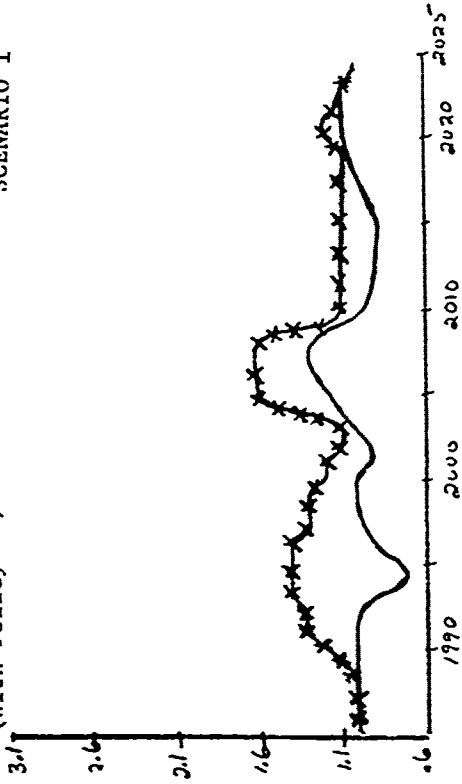


TREND: 82 Competence Under Stress

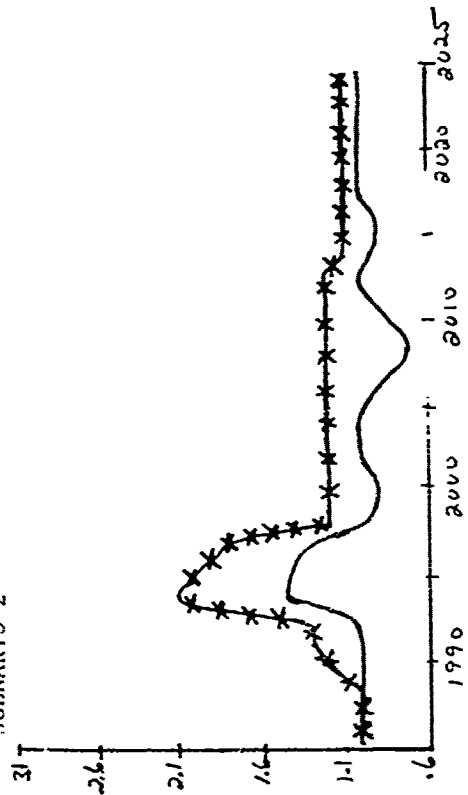


SCENARIO 1

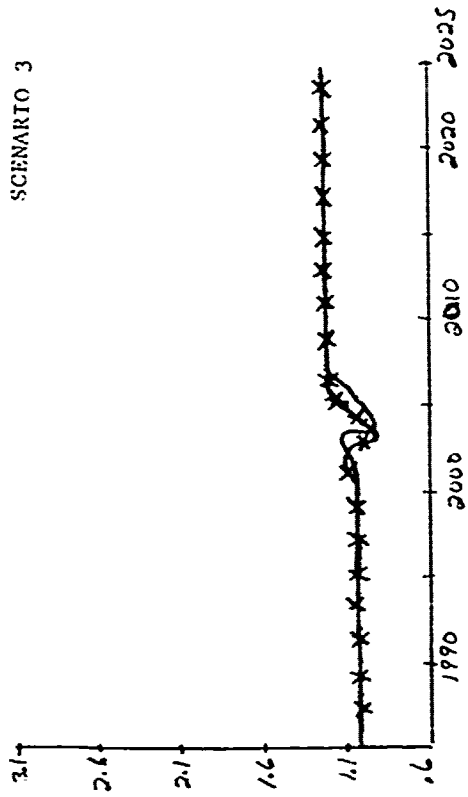
(With Policy \*\*)



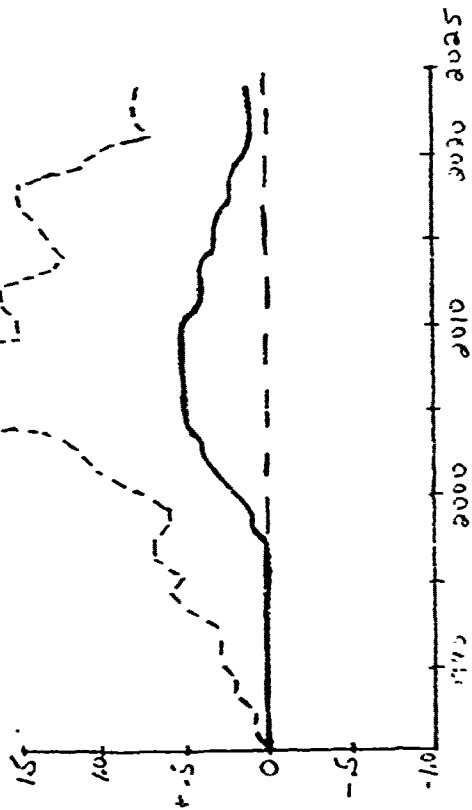
SCENARIO 2



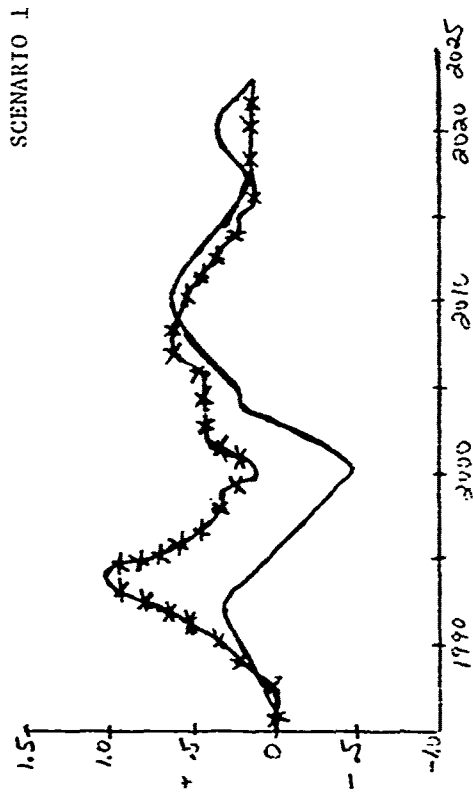
SCENARIO 3



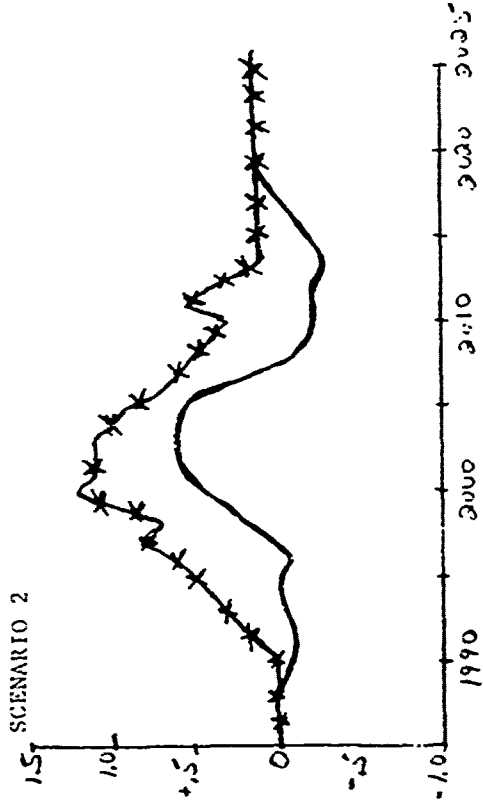
TREND: 83 Army-Threat Skill Proficiency



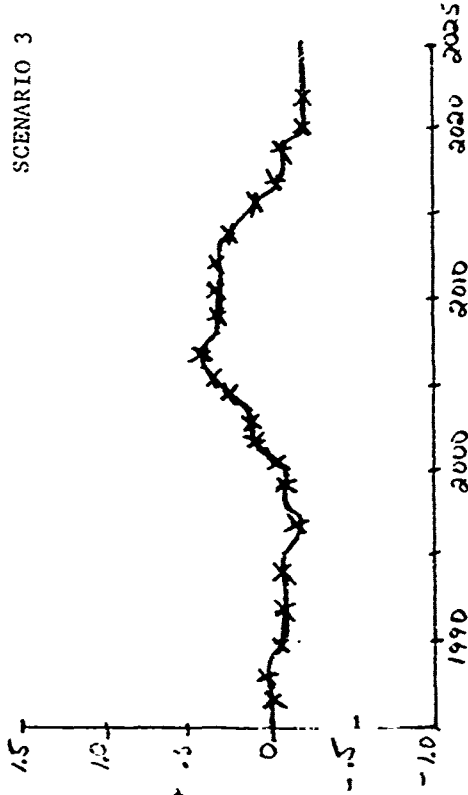
(With Policy \*\*)



SCENARIO 2



SCENARIO 3



## Appendix 8 to Annex II

### Graphs From The Final Set Of Simulations

#### POSE.

a. To present the graphs from the final set of simulations.

b. To present the graphs of the final nominal cumulative probabilities for events and the nominal forecast of trends for those trends which are forecasted (i.e., not indexed at "1.00" throughout the years of the model - 1984-2025).

#### 2. Discussion.

a. The graphs from the final set of simulations as contained in Tab A. Page II-8-A-1 outlines what is seen on next eight pages. In the upper left-hand corner of each graph is the name of the system-wide issue analyzed in each of the "worlds." Each "world" is a composite of 25 alternative scenarios. There is a brief description of the nature of the system-wide issue. There are eight graphs for each system-wide issue. Four graphs depict the nature of the system-wide issue throughout the four "worlds" without policy and four graphs depict the effect of PDOS-recommended policy within each "world." Within each graph are:

(1) Along the y-axis is the relative level of the trend with 1.00 being the value for 1984.

(2) Along the x-axis are the years of the simulation.

(3) The upper line is the line of maximum values throughout the 25 simulations (note: no single scenario traces any of the lines).

(4) The middle line is the line of average values throughout the 25 simulations.

(5) The bottom line is the line of minimum values throughout the 25 simulations.

b. The graphs shown in Tab B reflect the final nominal data in the PDOS INTERA model. The first set of graphs, II-8-B-1 thru II-8-B-20, is the nominal event data. The second set of graphs, II-8-B-21 thru II-8-B-27, is the nominal trend data. Trend 50, ARMY T & E BUDGET, II-8-B-24, is an example of an index trend. Notice that all the data points are "1.0". None of the other index trends are shown since the graphs for these trends would only show a straight line with a value of "1.0".

#### Tab

A — Simulation

B — Nominal Data



**SYSTEM-WIDE ISSUE**

25 ALTERNATIVE SCENARIOS FOR EACH SIMULATION

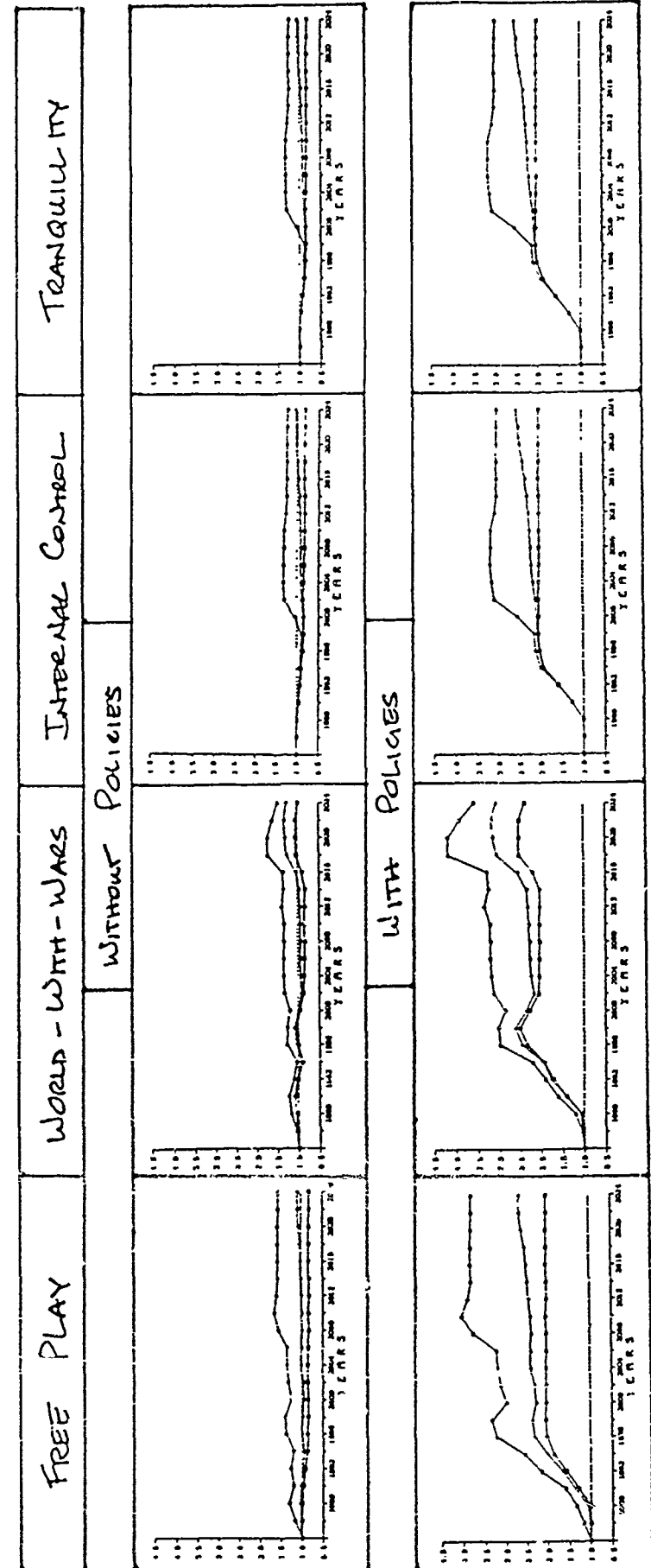
BRIEF DESCRIPTION OF THE SYSTEM-WIDE ISSUE

FREE PLAY	WORLD - WITH - WARS	INTERNAL CONTROL	TRANQUILITY
WITHOUT POLICIES			
WITH POLICIES			

# ART AND SCIENCE OF WAR

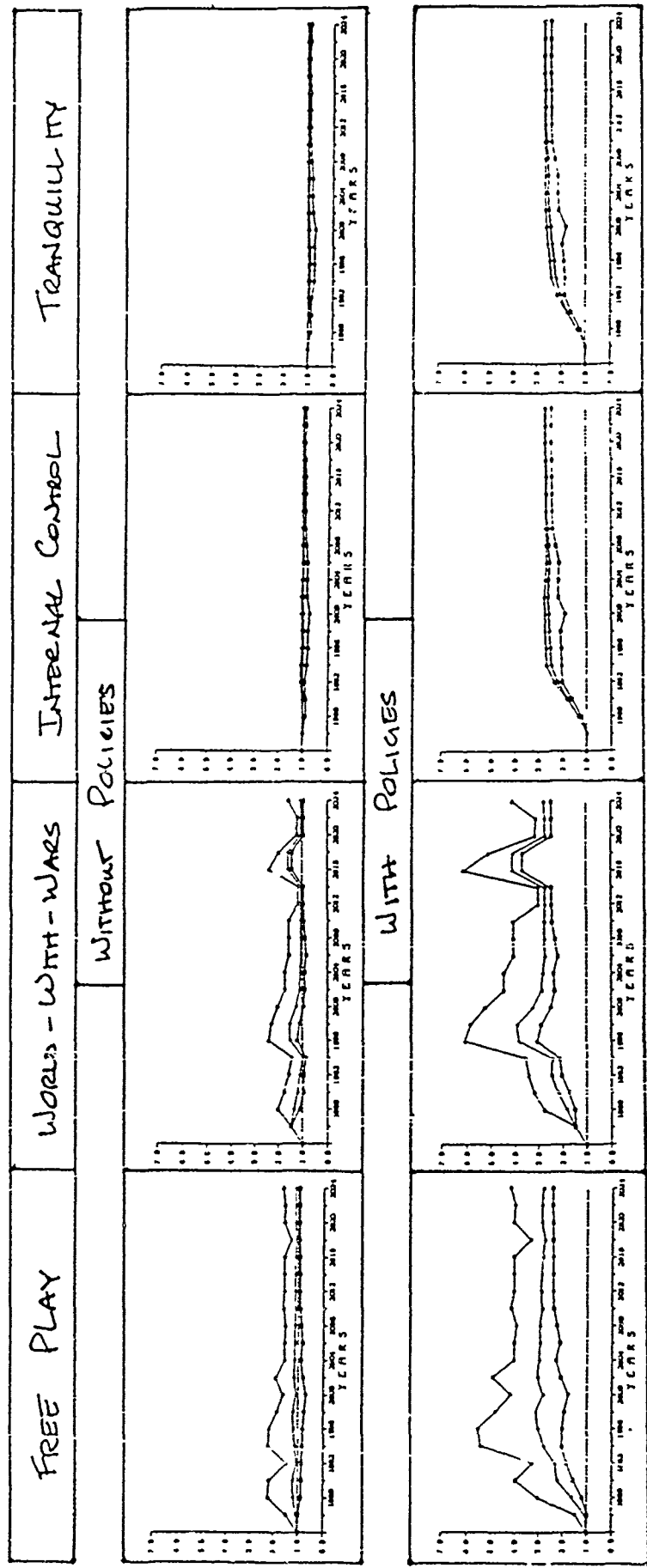
--Level of officer adherence to the principles of and knowledge of the art and science of war which includes:

- a. Theoretical knowledge and practical skills/proficiencies for each Transition Period.
- b. Knowledge of the human dimension of war.
- c. An historical perspective of war.
- d. The ability to envision the future war.



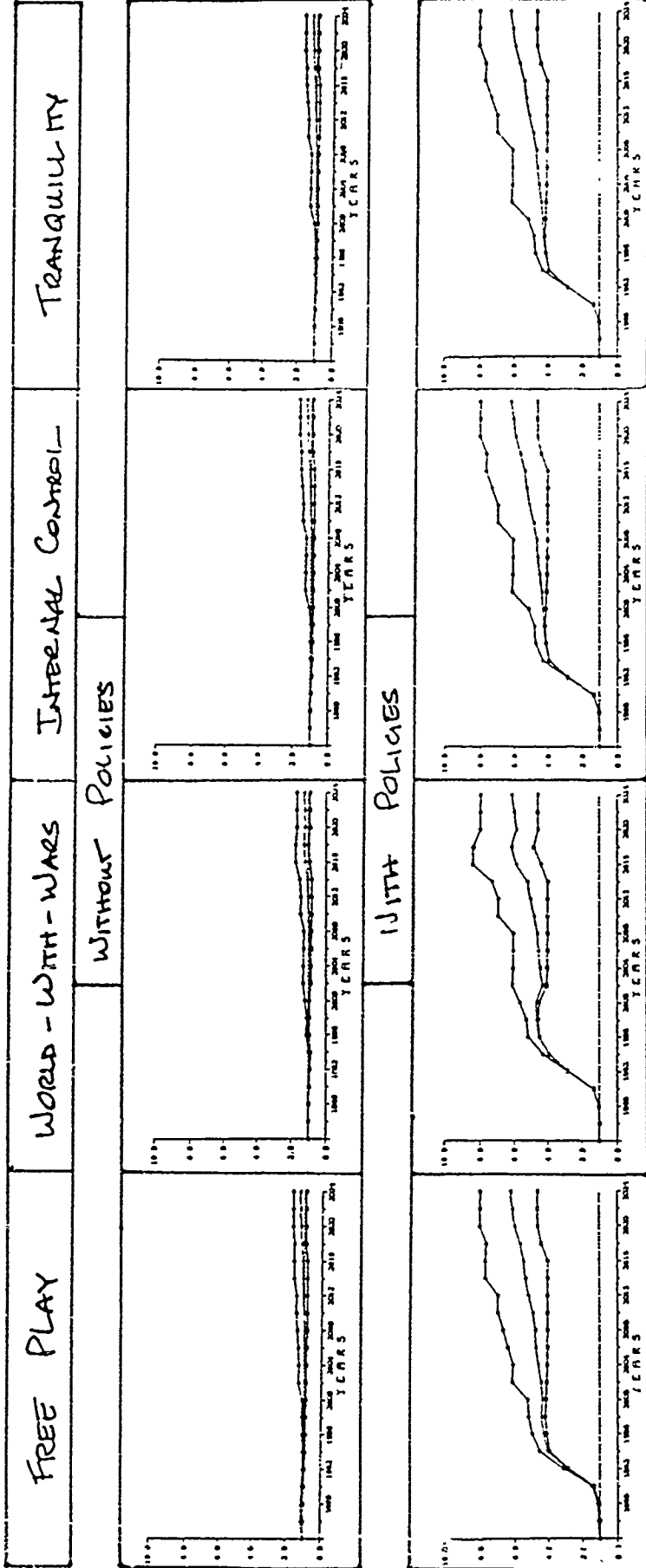
**WARRIOR SPIRIT**

--Level of officer adherence to the state-of-mind and preparedness that blends all the physical, mental and moral qualities essential for an officer to successfully lead the Army in its mission of protecting the Nation. Officers accept the responsibility of being entrusted with the protection of the Nation; are prepared physically and mentally to lead units to fight and support in combat; are skilled in the use of weapons, organizations and tactics; inspire confidence and an eagerness to be part of a team; has the ability to analyze and the boldness to take action to accomplish the mission.



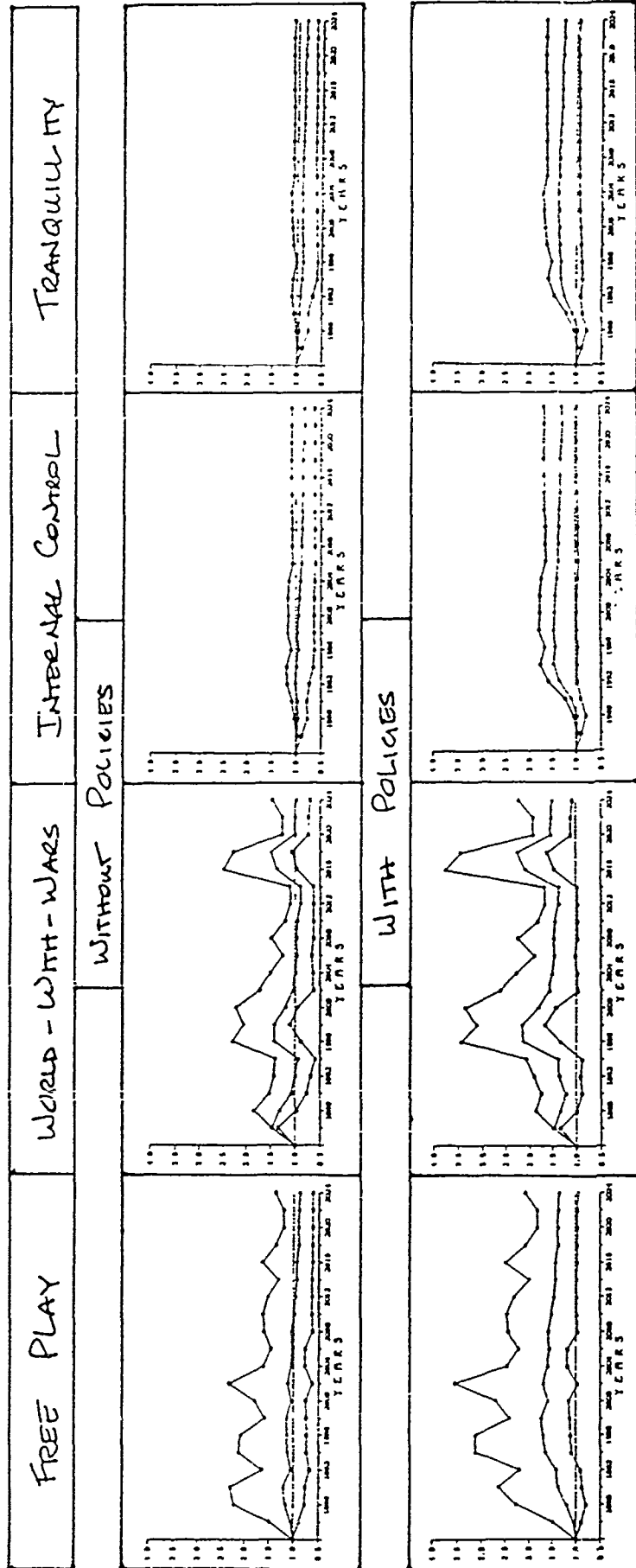
SELF - DEVELOPMENT

--Level of officer acceptance of primary responsibility to progressively grow and learn, both the profession of arms and his/her functional specialty(ies).



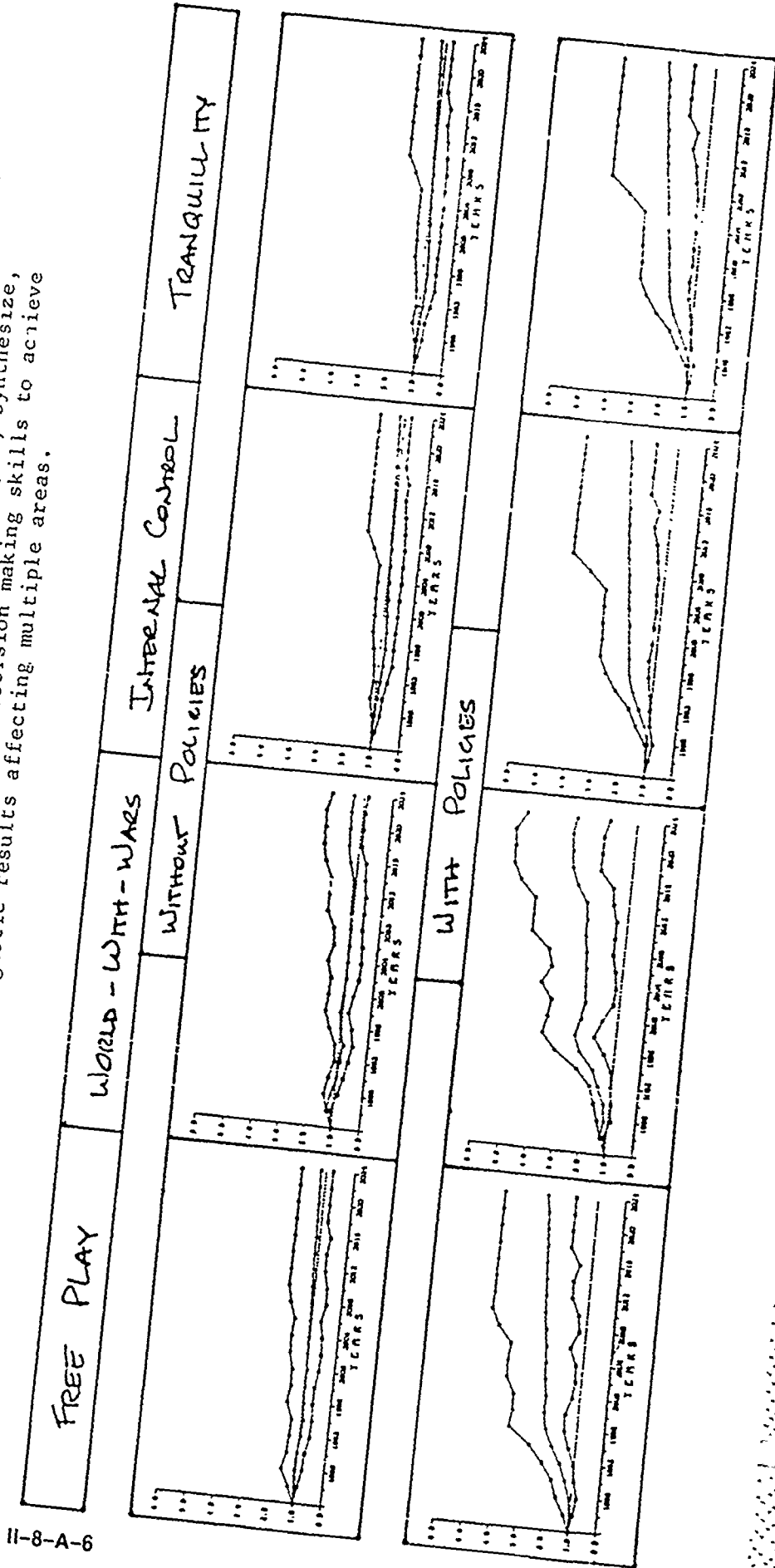
LEADER - MENTOR

--Level of officer adherence to a style of leadership which facilitates the growth and development of subordinates by educating, socializing and training subordinates and by being for those subordinates a role model, a teacher, a coach, an advisor and a guide.



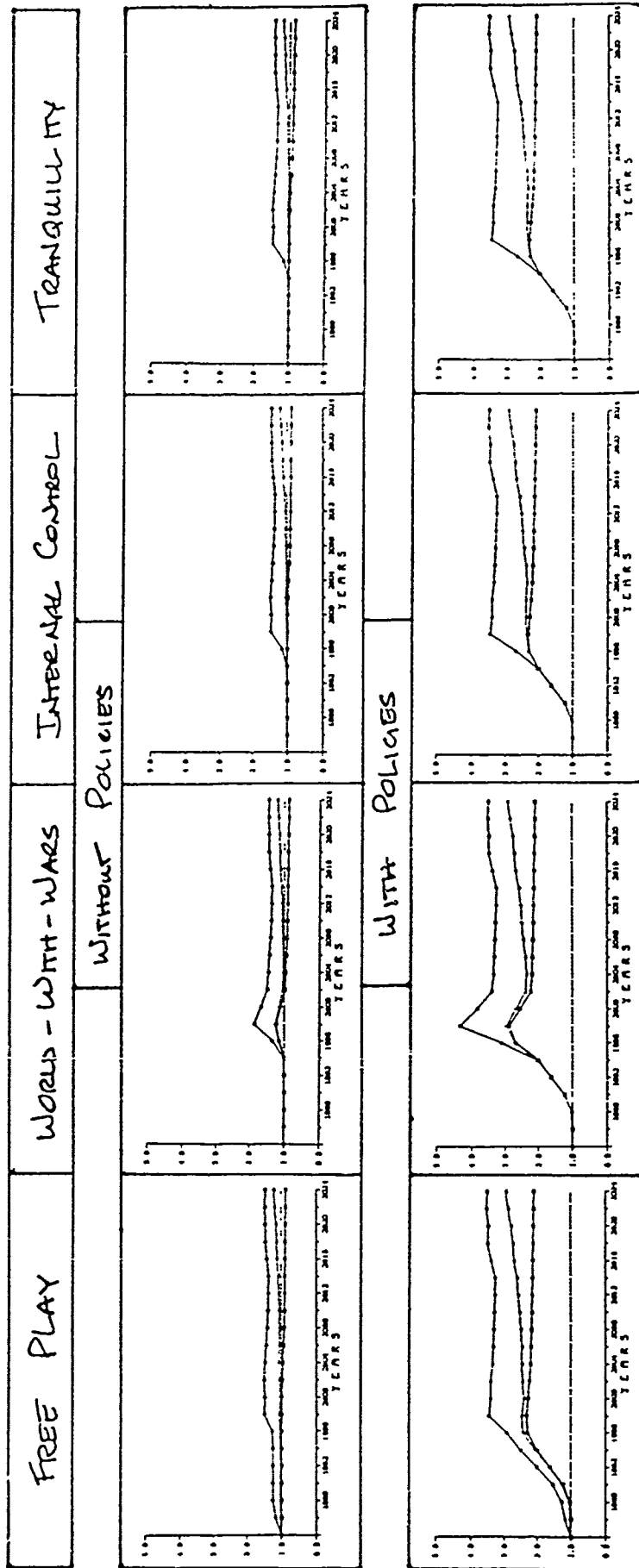
**EXPERT - INTEGRATOR**

--Expert--Level of officer in-depth knowledge and capabilities in a single branch, functional area and/or area of specifically defined area.  
 and capabilities in one or more branches, functional areas and/or areas of concentration and ability to analyze, synthesize, synergistic results affecting multiple areas.



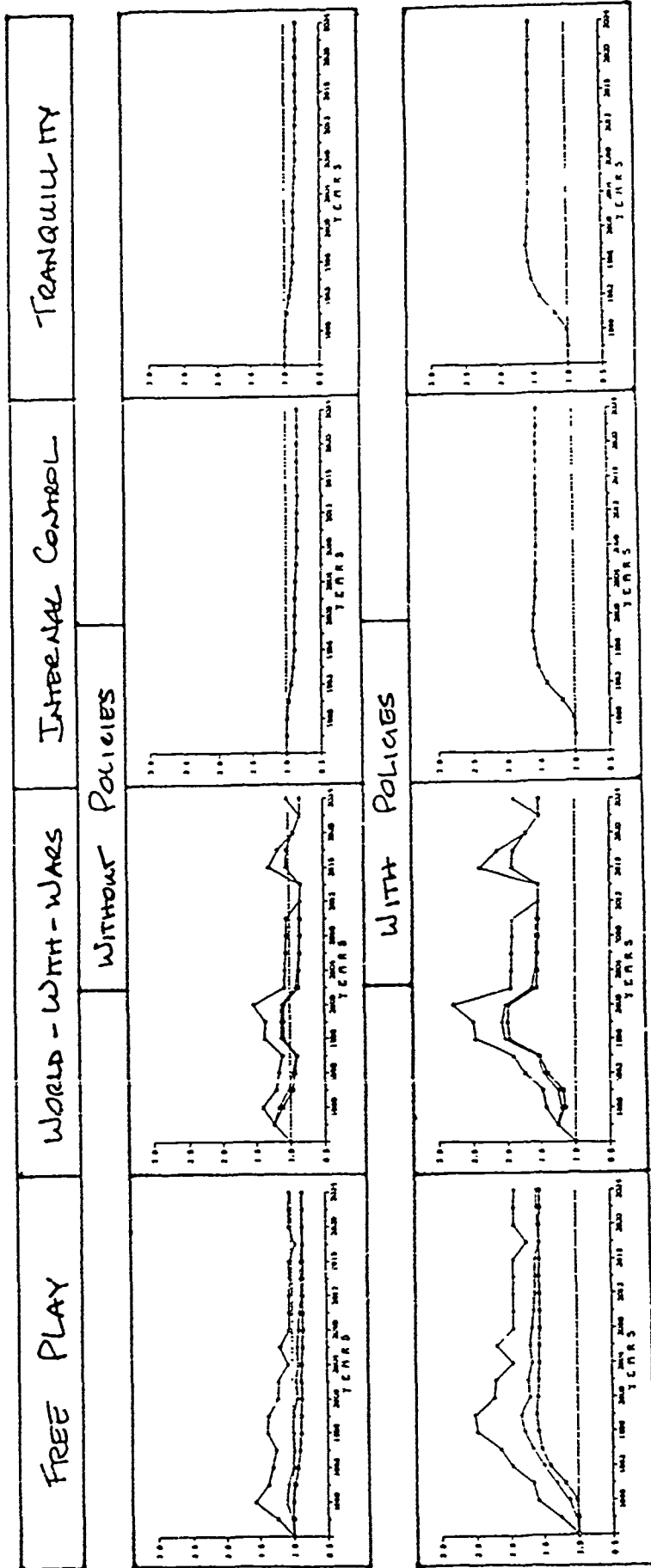
DECISION MAKING SKILLS

--Level of officer ability to use analytical and conceptual skills necessary to establish goals and objectives, identify problems, develop alternatives, evaluate alternatives, choose an alternative, implement, control and evaluate decisions.



COMMON SHARED OPERATIONAL LANGUAGE

--Level of officer proficiency in the skills associated with using a common military operational language.

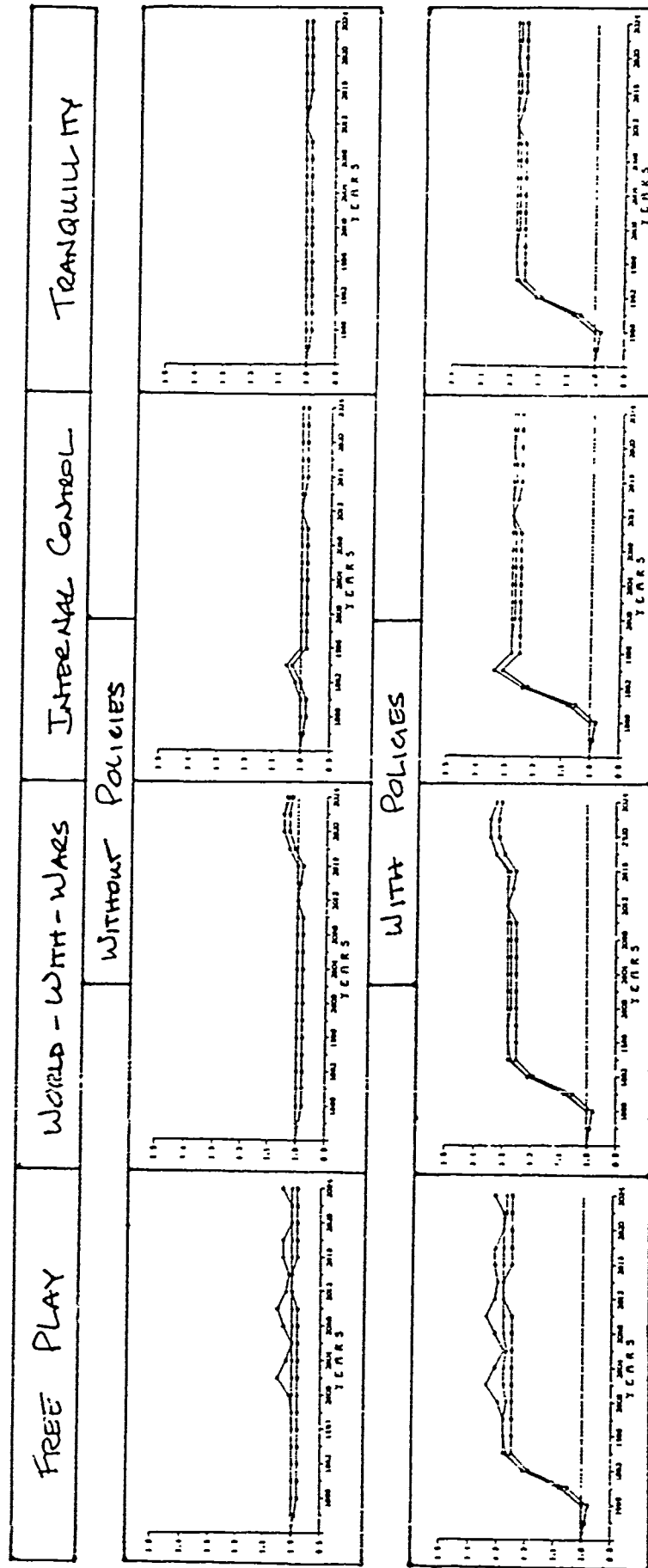




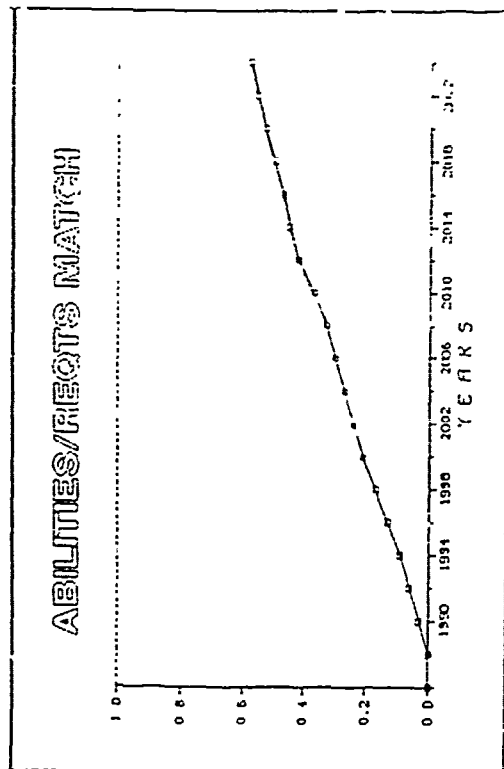
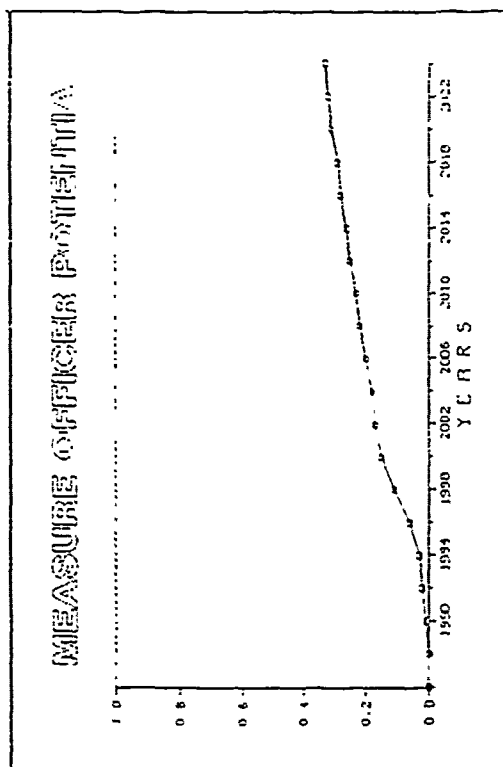
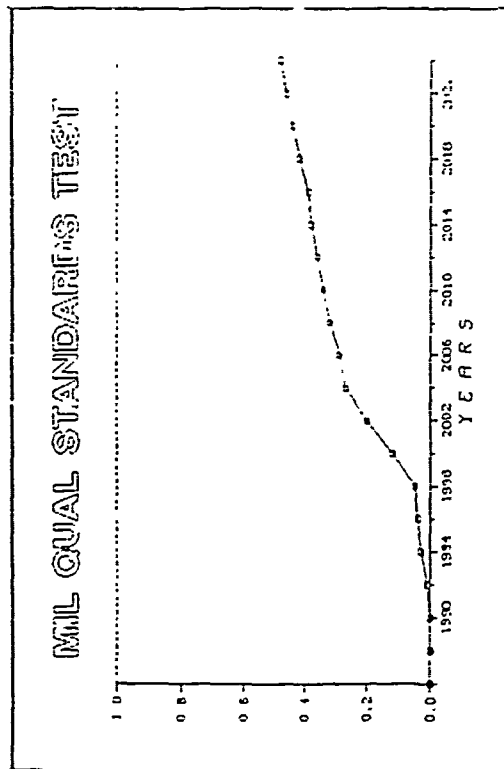
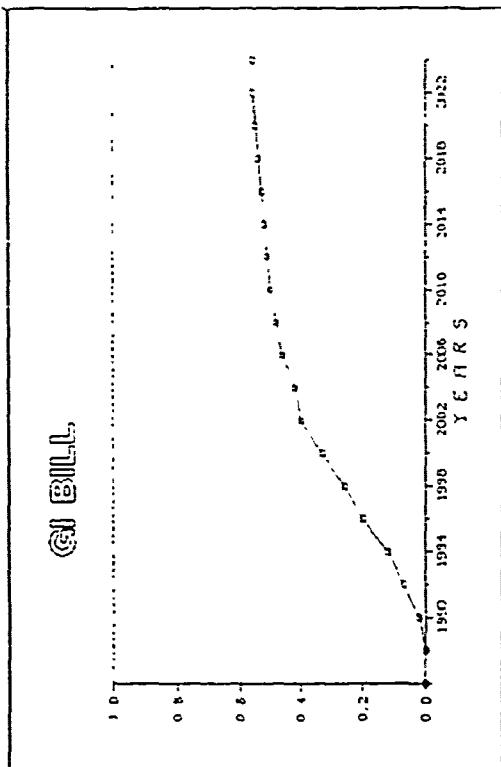
Tab A to Appendix 8, Simulations

PROFESSIONAL VALUES

--Level of officer adherence affectively and behaviorally to the complex set of professional values described in the "PDOS System-Wide Transition Period" literature: briefly-- officers accept the responsibility for protecting the Nation; they internalize and display the values of integrity, selflessness honesty, special trust, loyalty, care for soldiers and their families, excellence in performance of all duties; they establish a command climate which produces initiative, trust and mentorship.

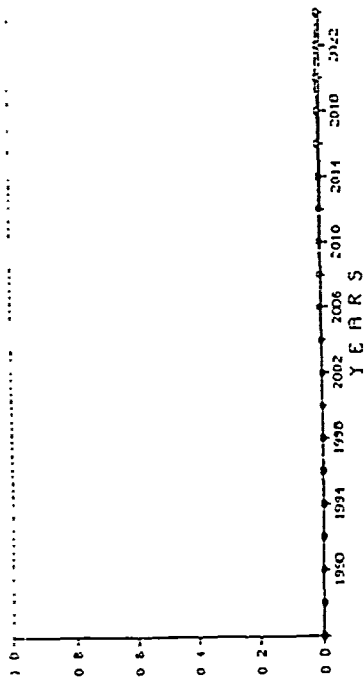


# NOMINAL EVENT DATA



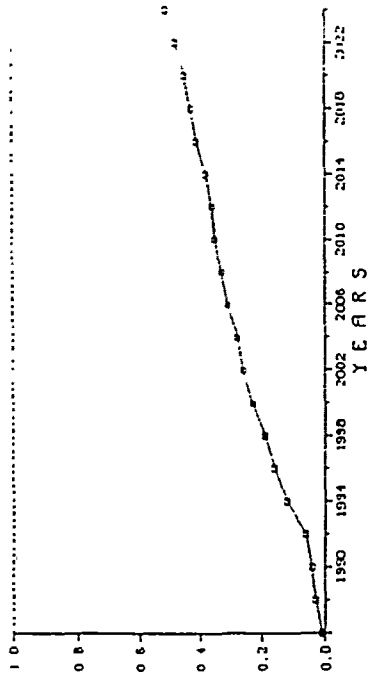
# NOMINAL EVENT DATA

UNAUTHORIZED NUCLEAR USE



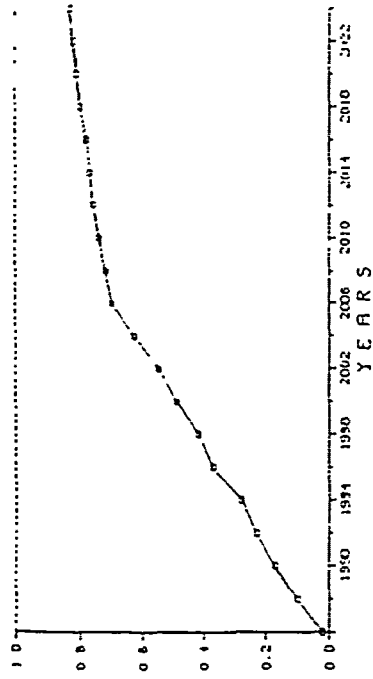
EVENT #8

ARMY TO CONTROL RIOTS



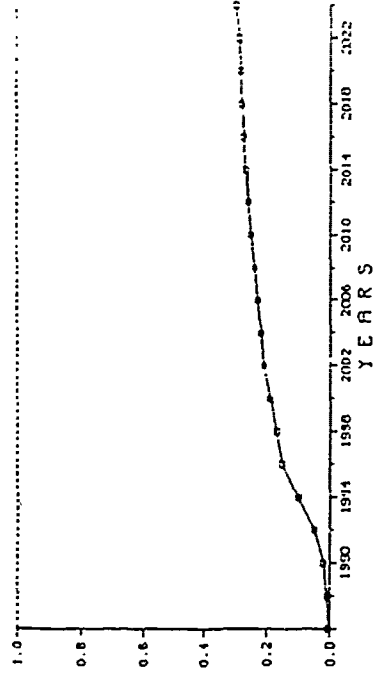
EVENT #9

RETIREMENT CHANGES EXTEND



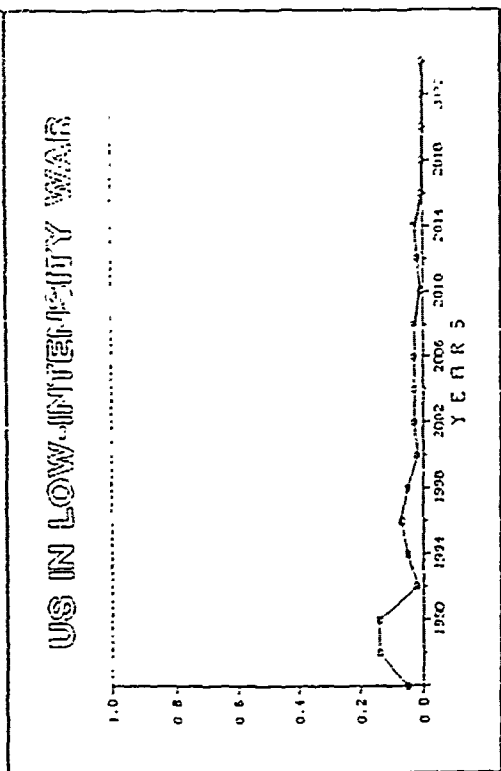
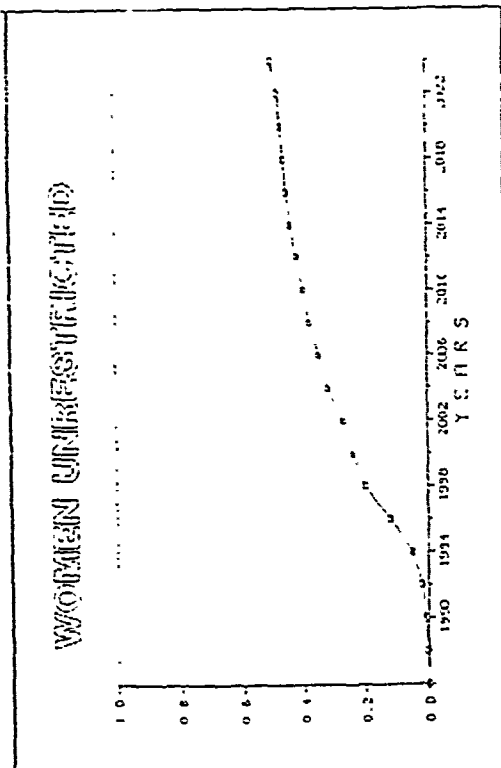
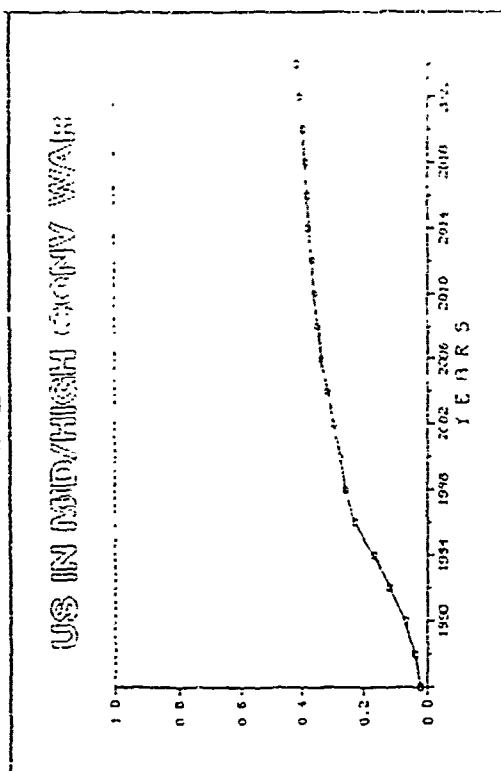
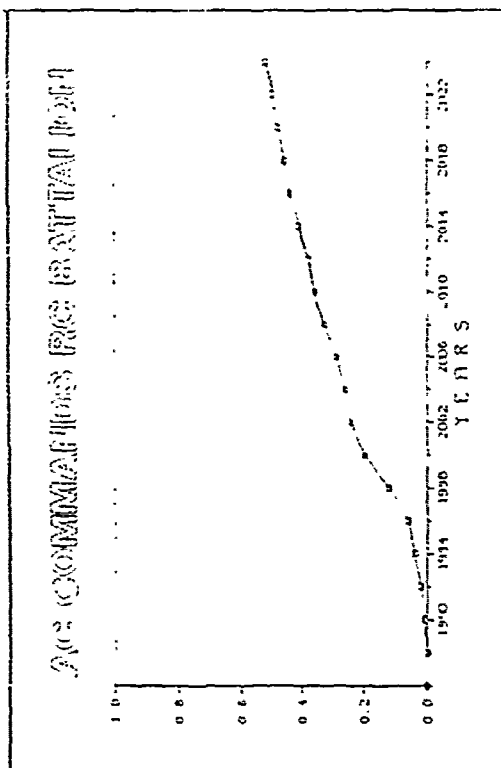
EVENT #10

RESERVE MOBILIZED

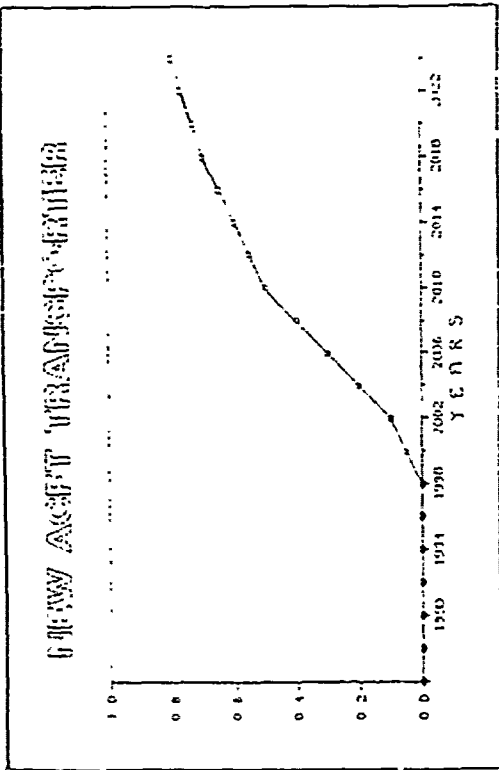
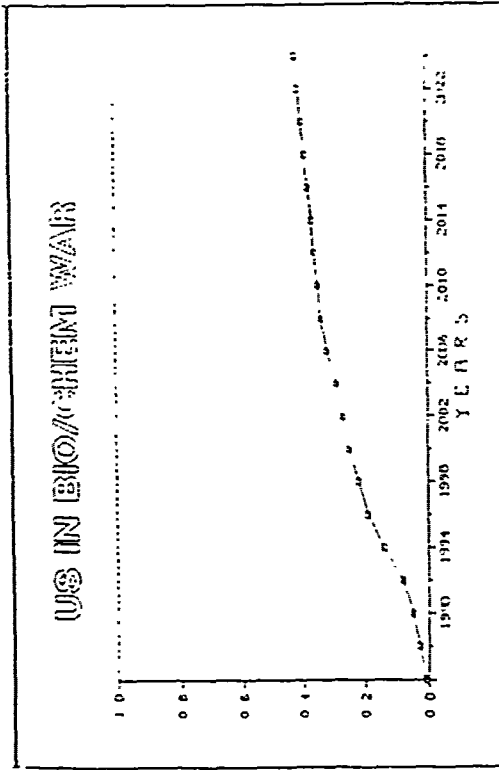
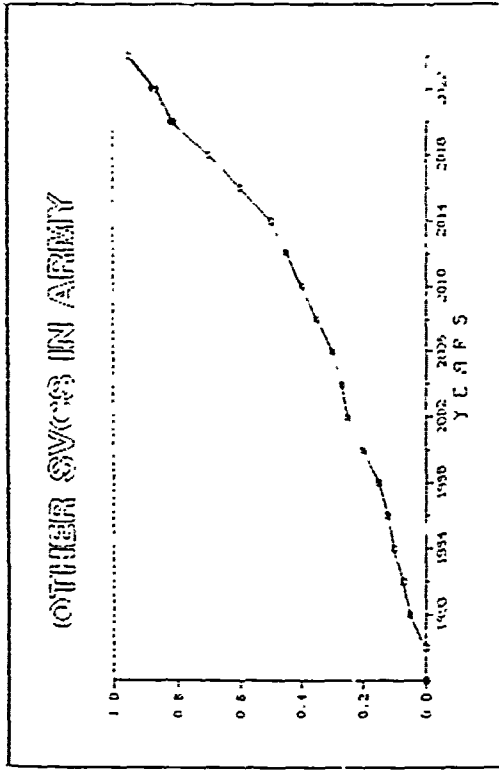
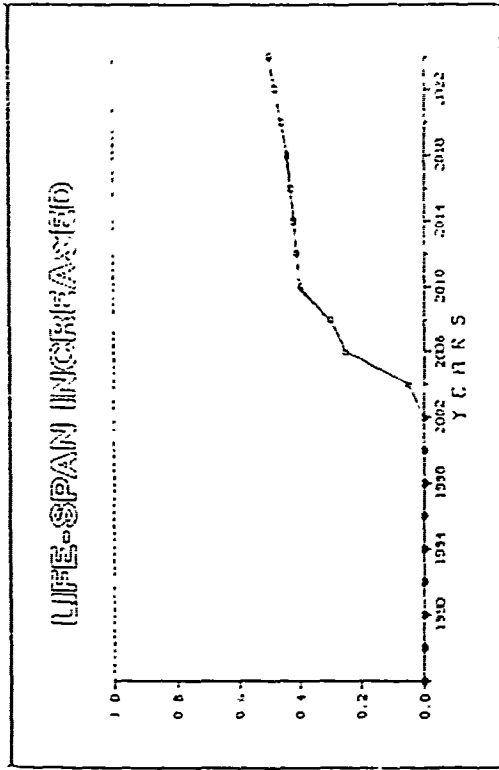


EVENT #11

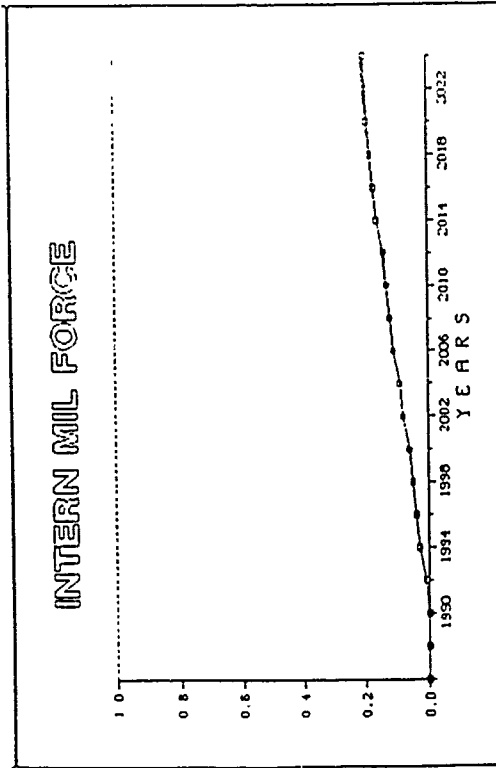
# NOMINAL EVENT DATA



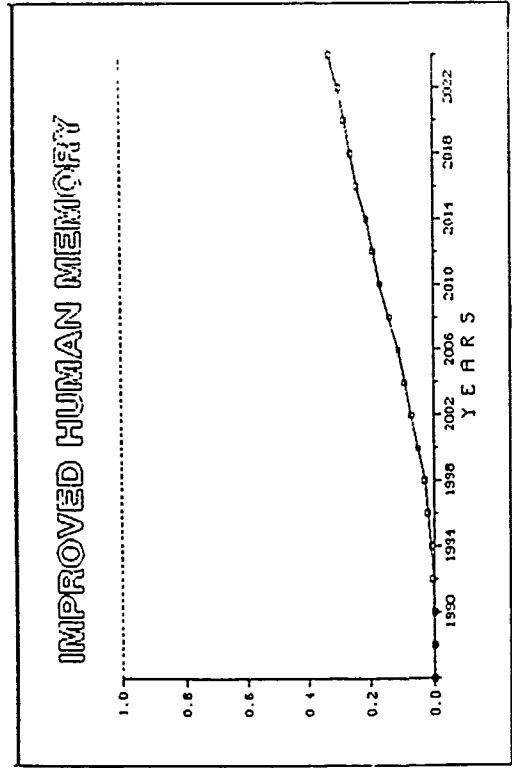
# NOMINAL EVENT DATA



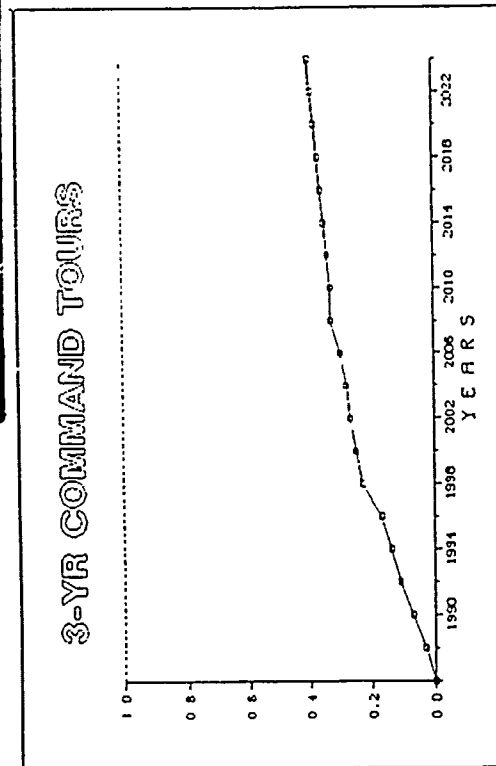
# NOMINAL EVENT DATA



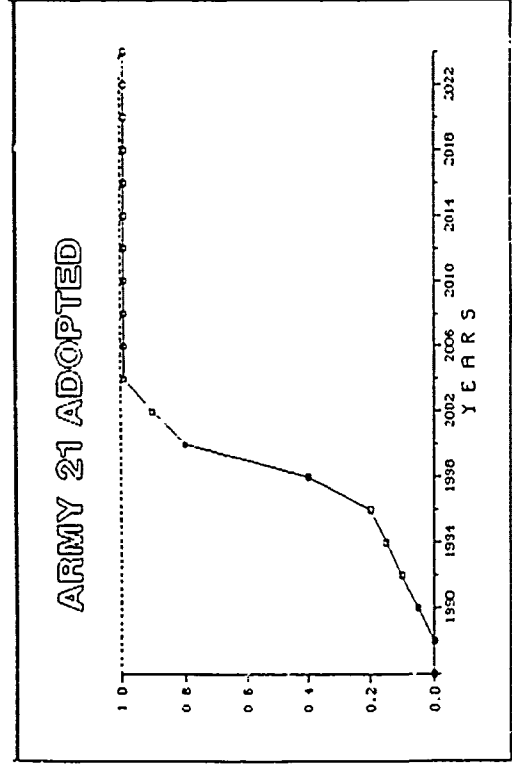
EVENT #27



EVENT #29

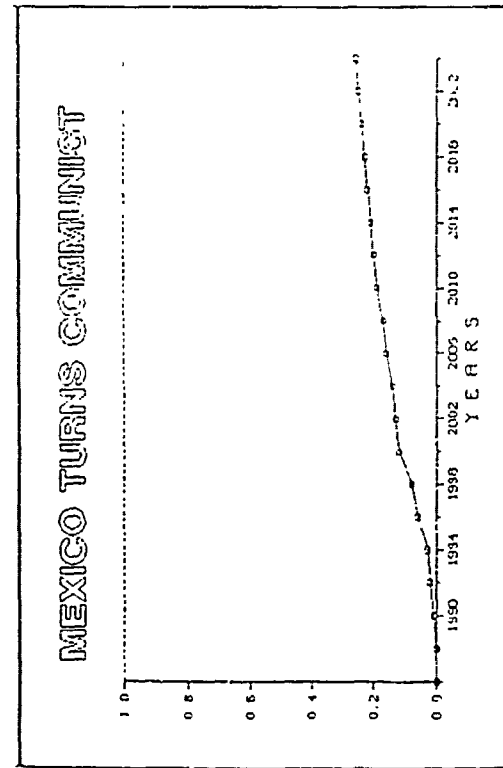
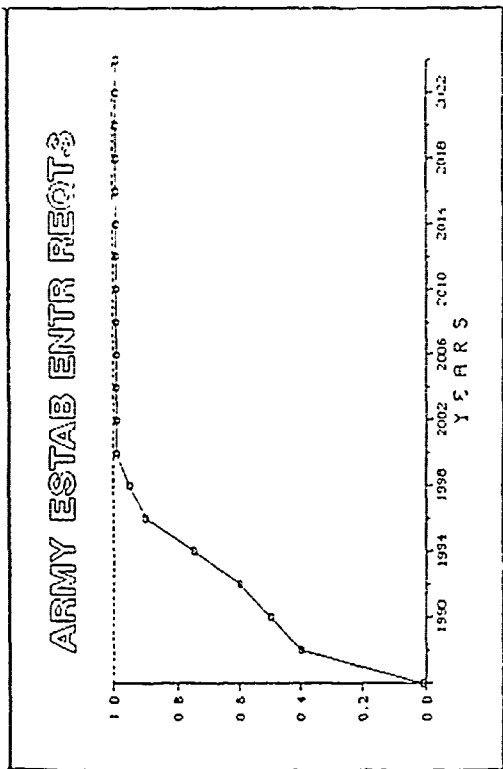
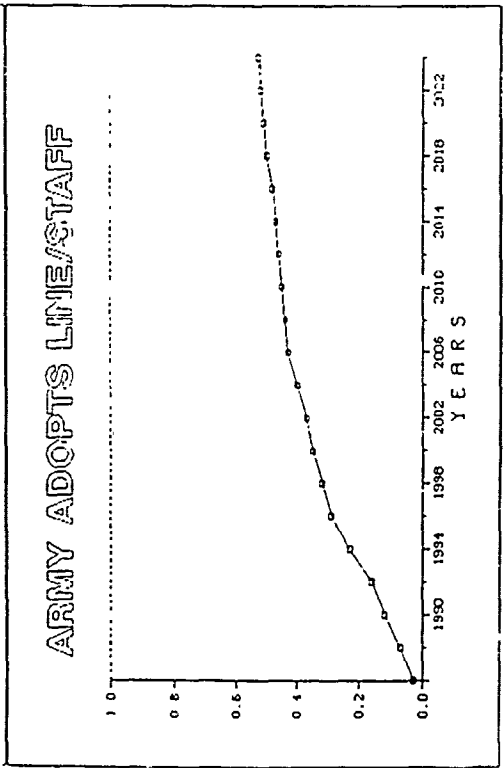
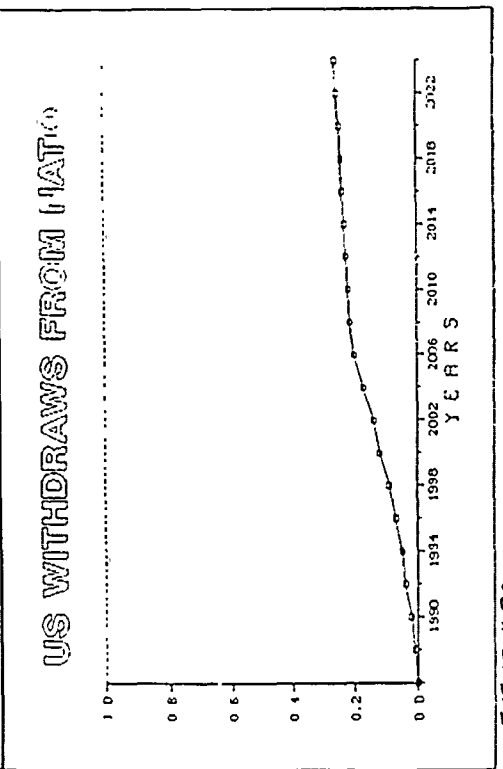


EVENT #26

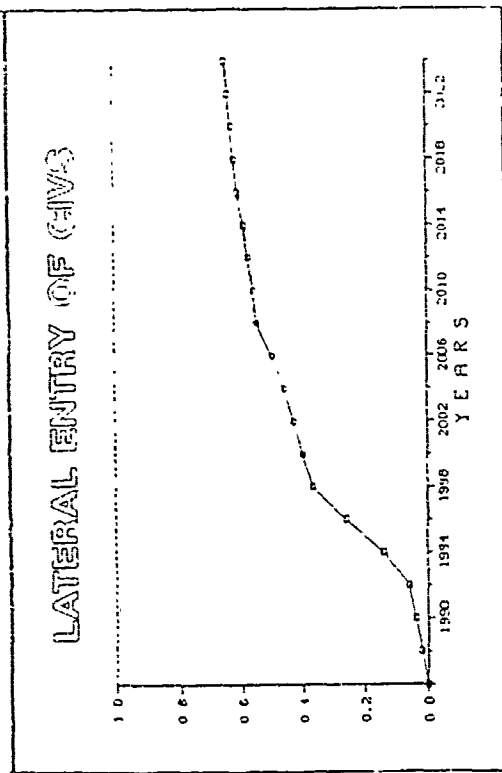


EVENT #28

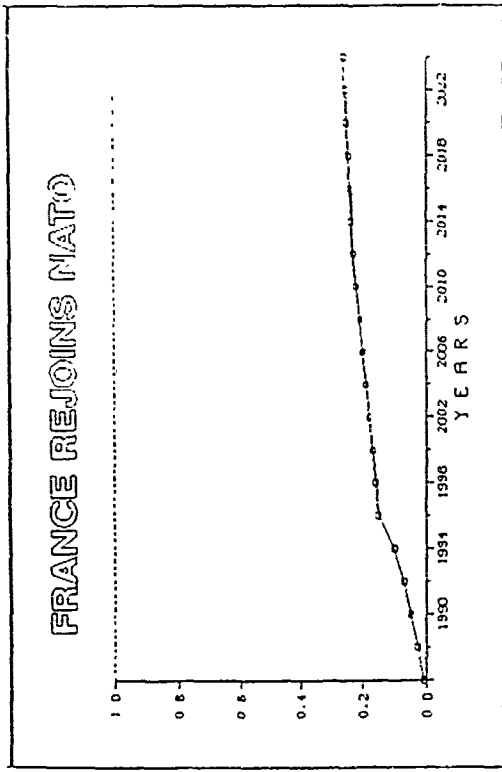
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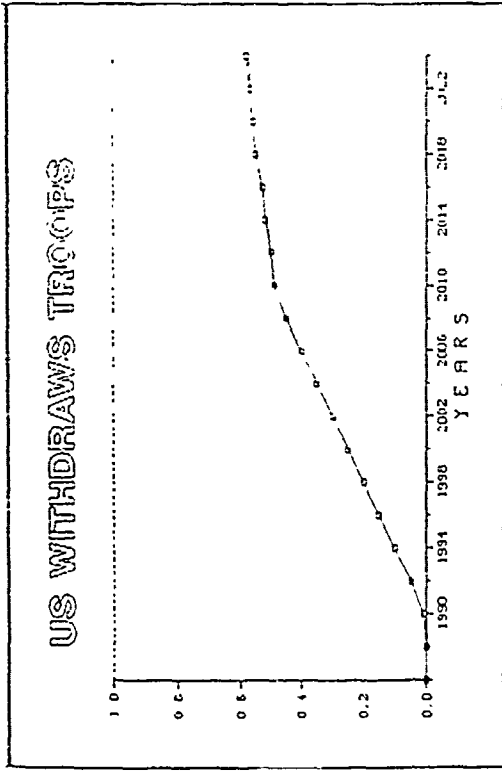
# NOMINAL EVENT DATA



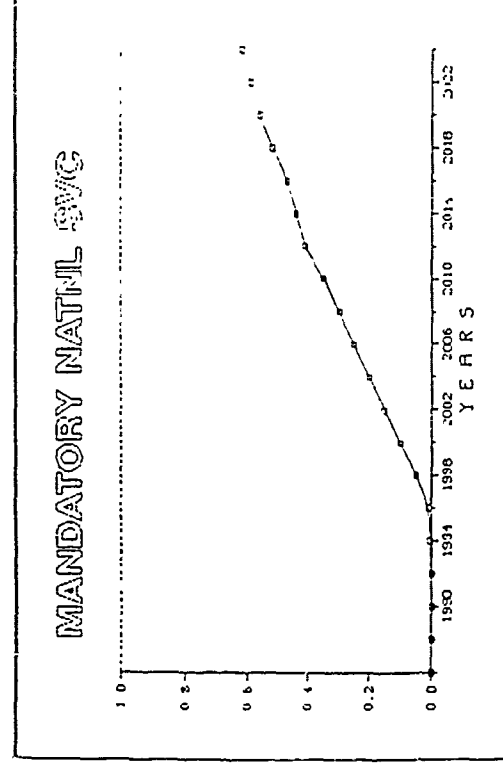
EVENT # 36



EVENT # 37



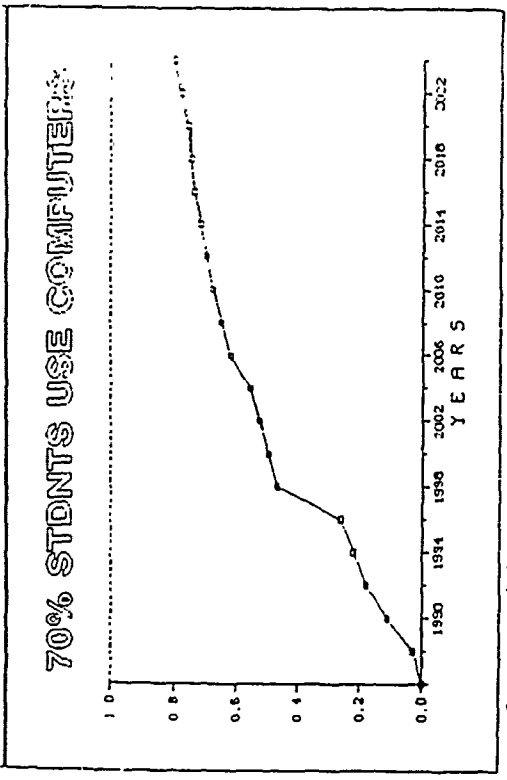
EVENT # 38



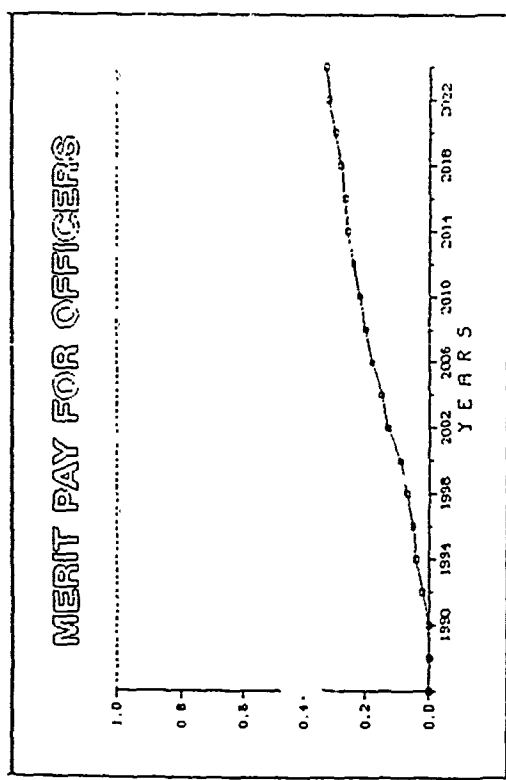
EVENT # 39



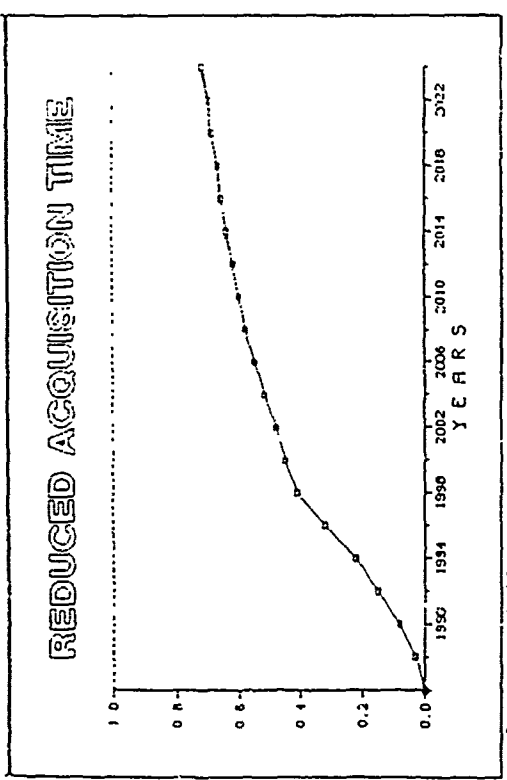
# NOMINAL EVENT DATA



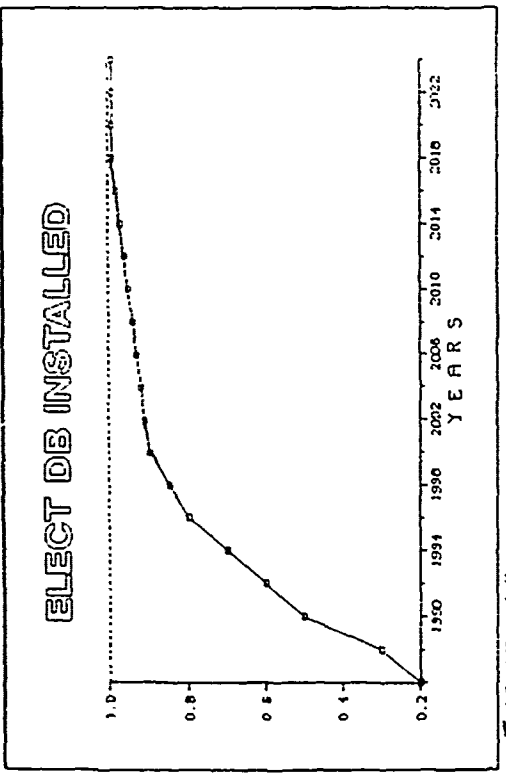
EVENT #41



EVENT #43

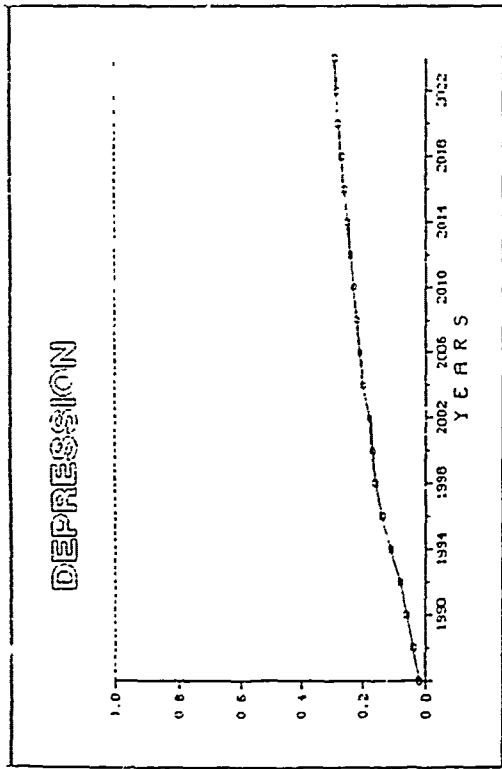


EVENT #40

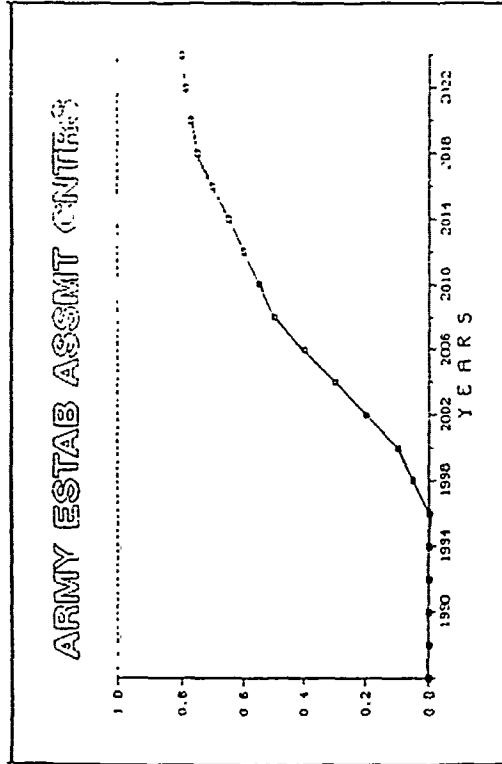


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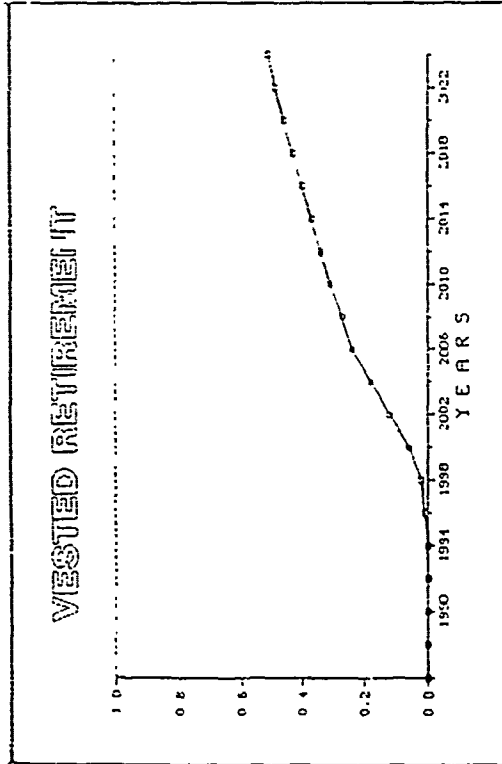
# NOMINAL EVENT DATA



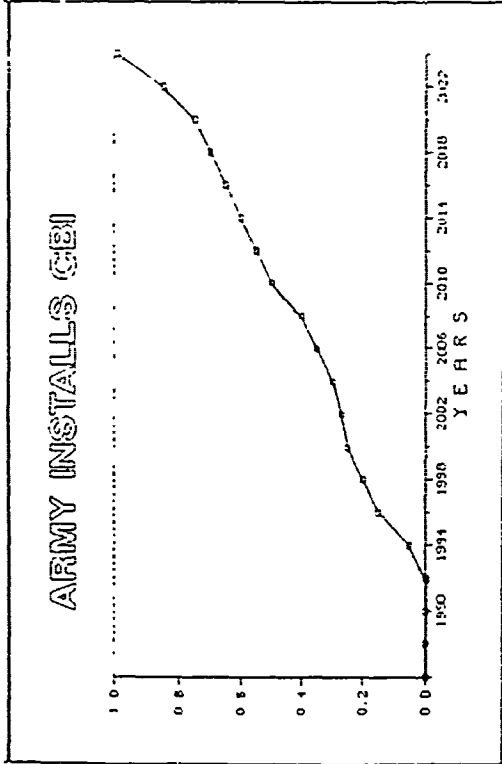
EVENT # 45



EVENT # 47

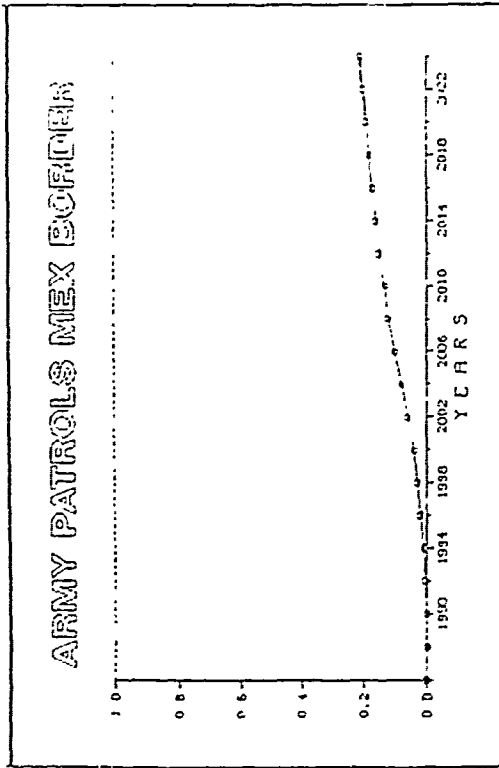


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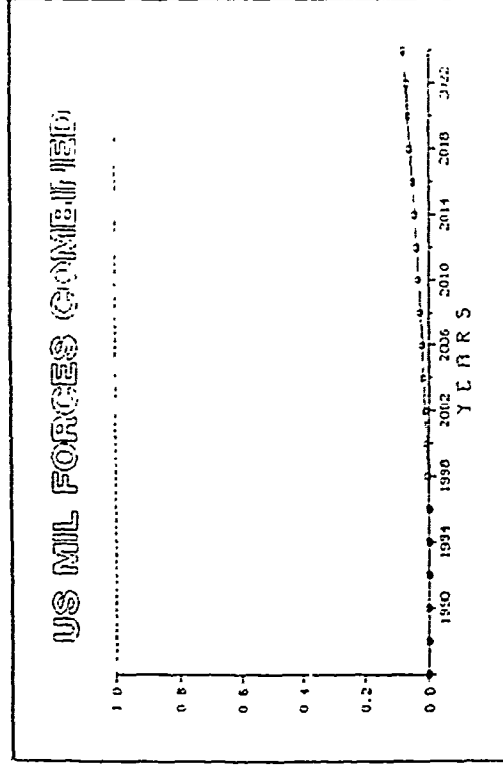


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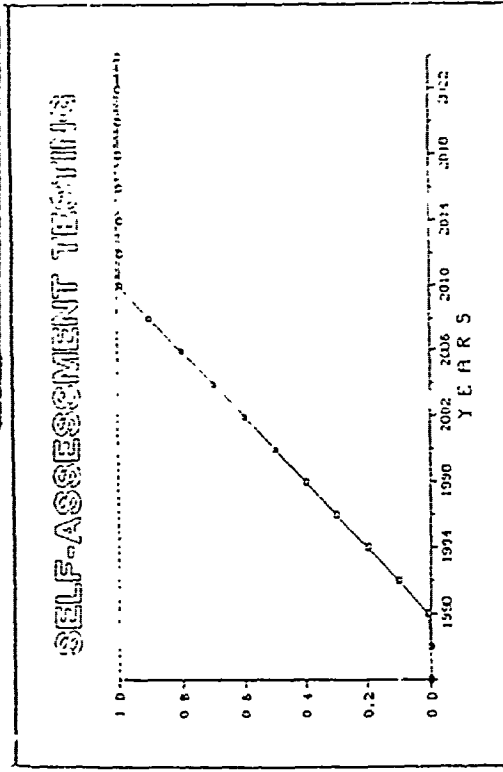
# NOMINAL EVENT DATA



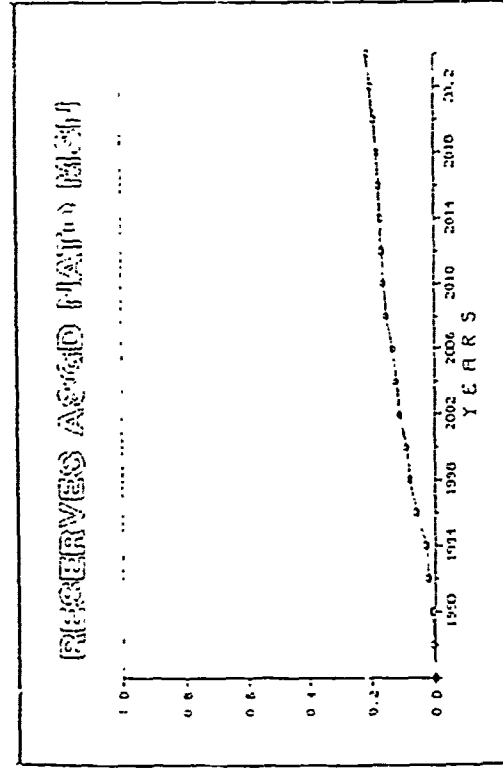
EVENT # 49



EVENT # 51

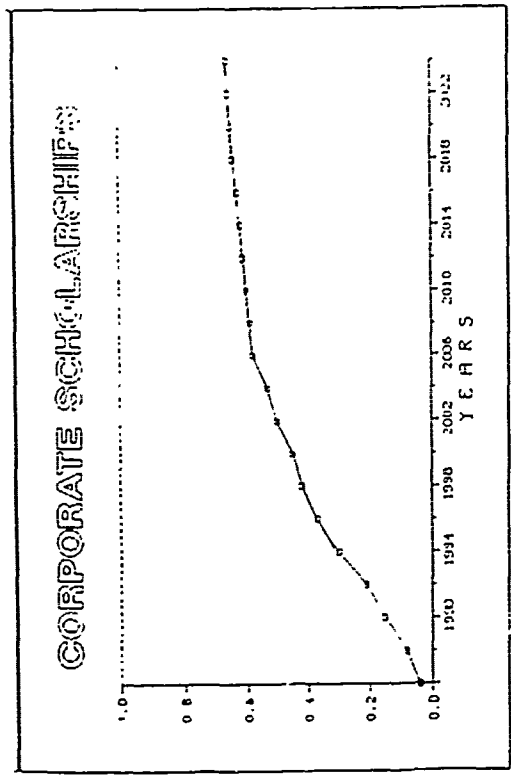
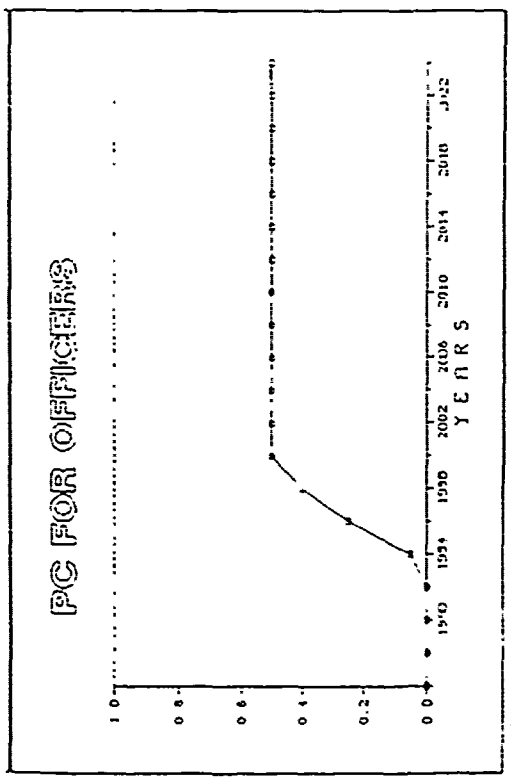
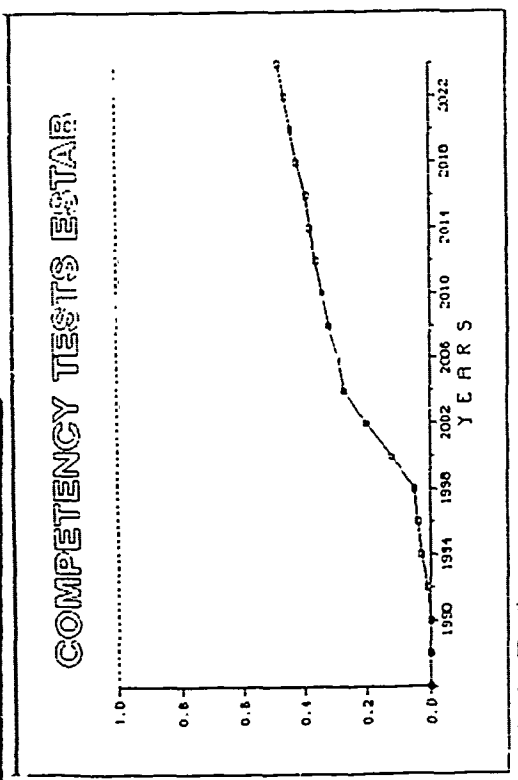
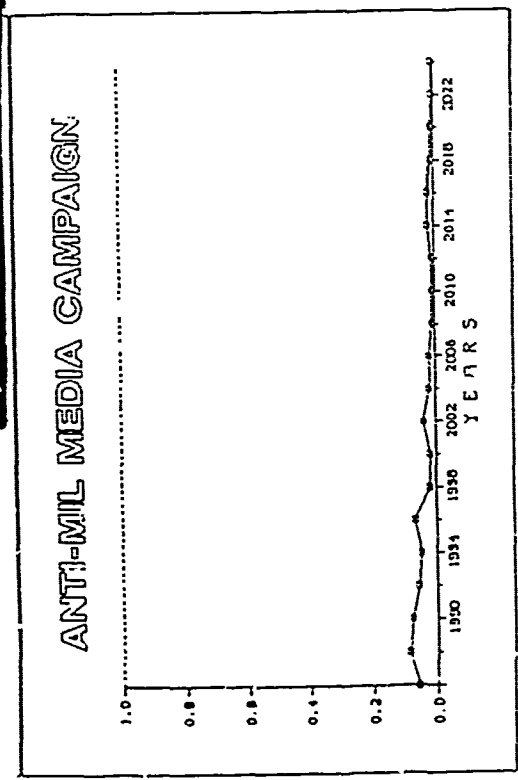


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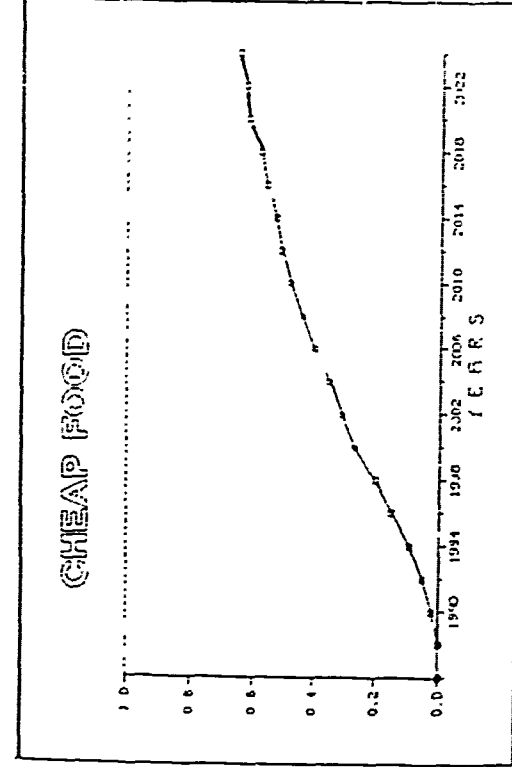
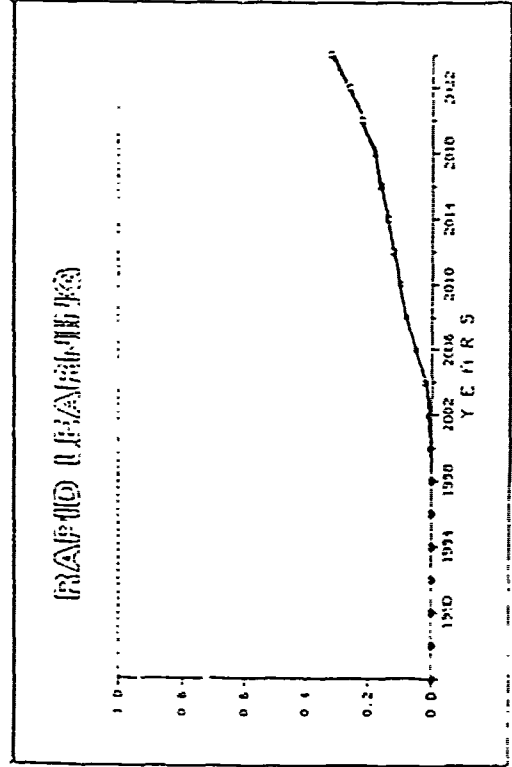
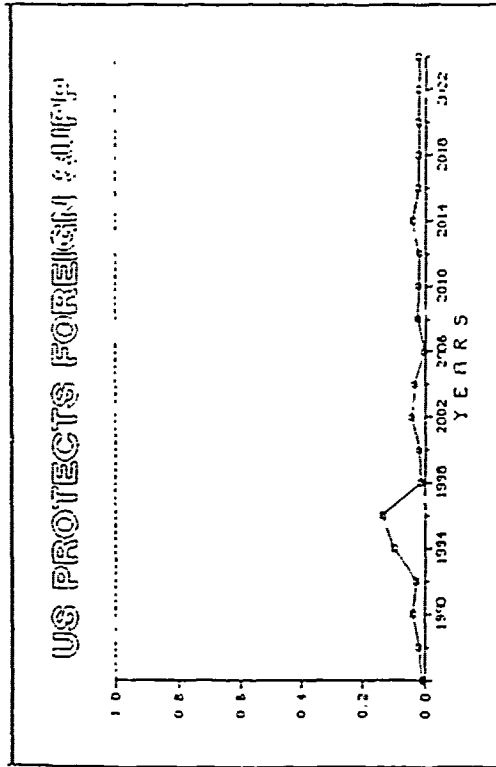
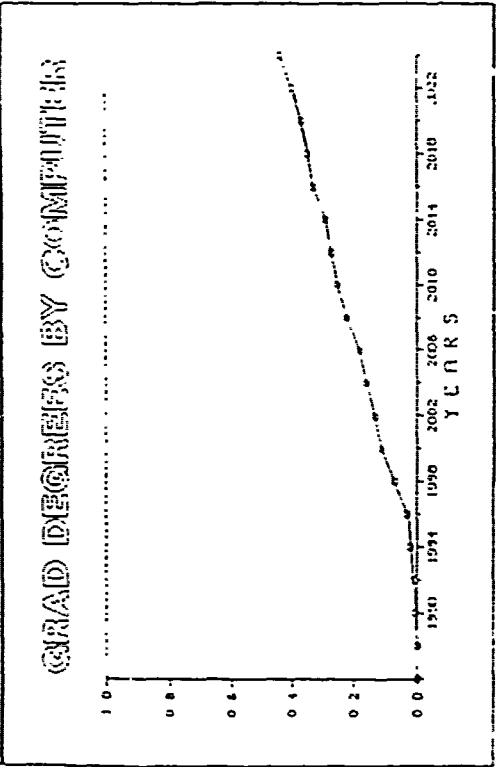


EVENT # 50

# NOMINAL EVENT DATA

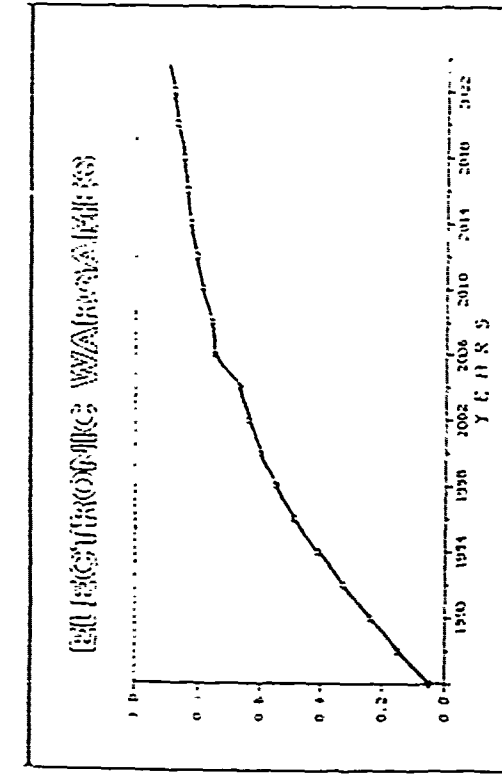
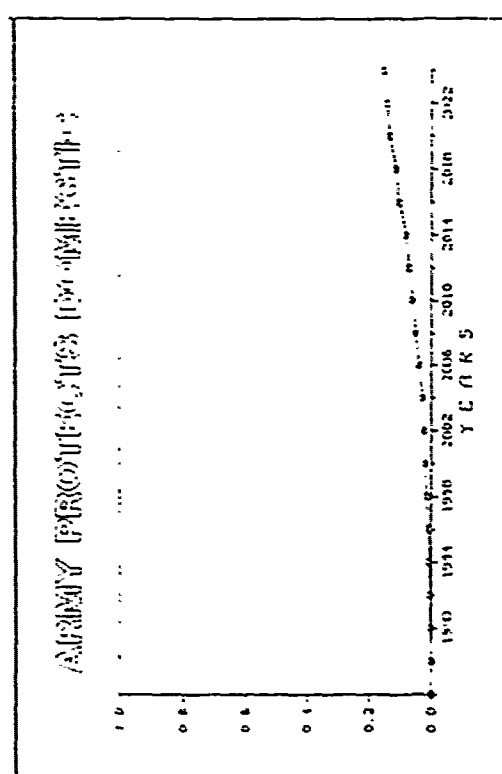
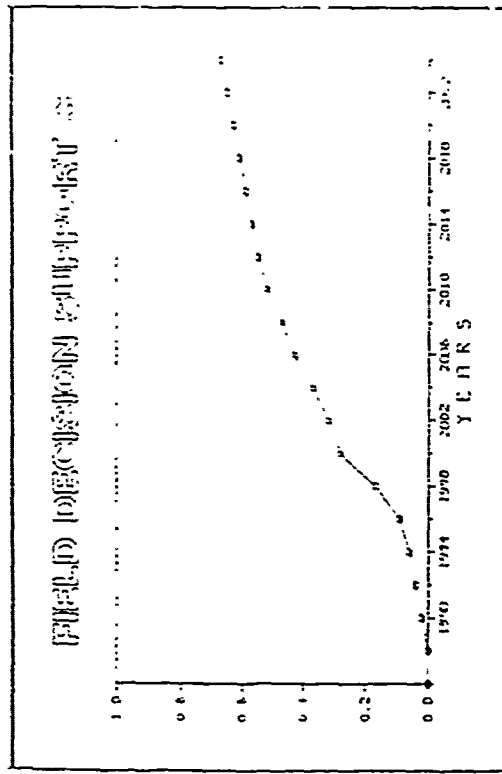
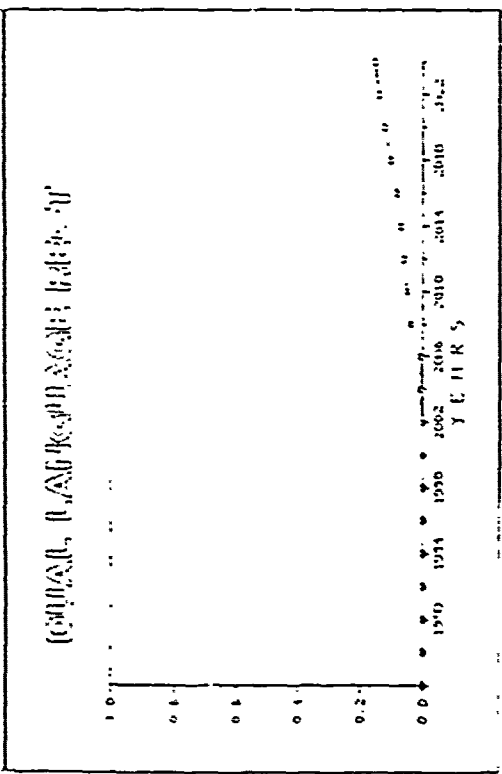


# NOMINAL EVENT DATA

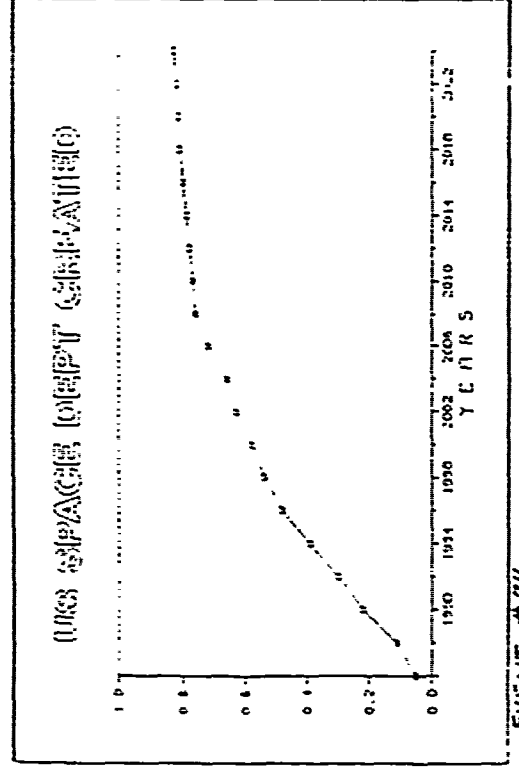
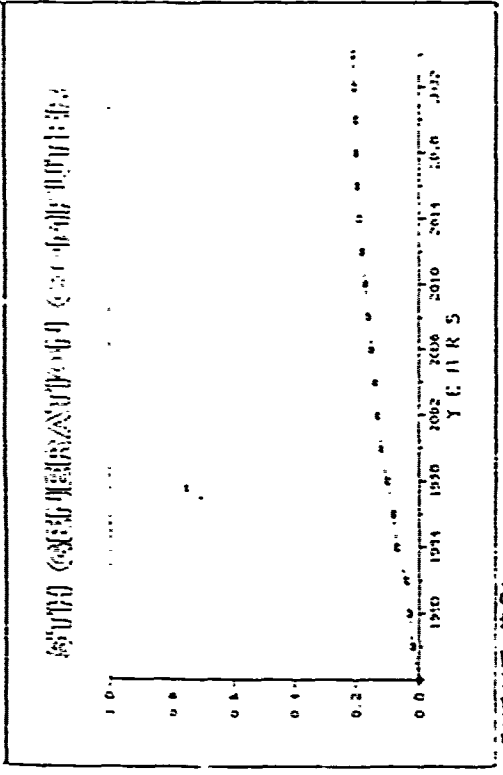
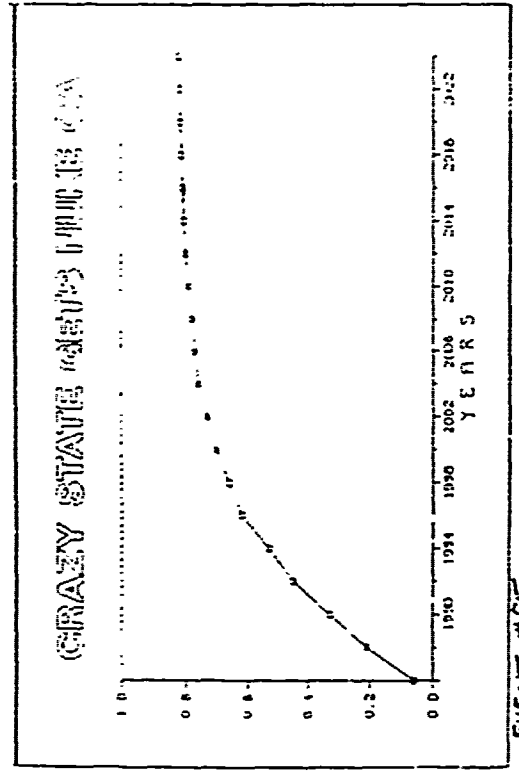
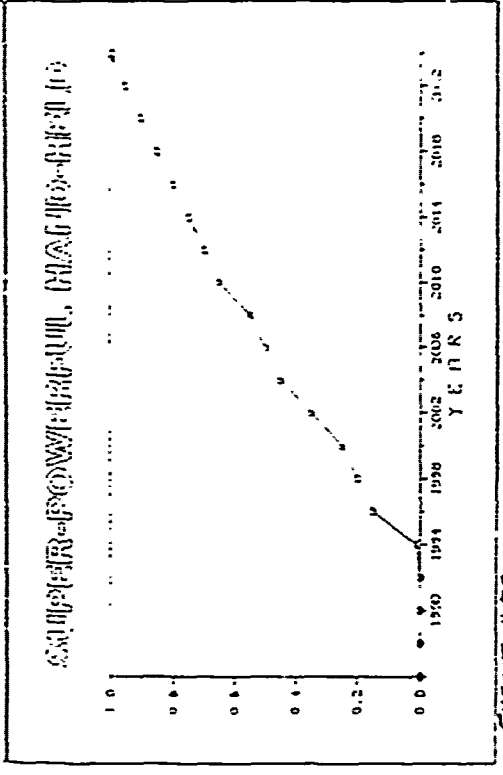


Tab B to Appendix 8, Nominal Data

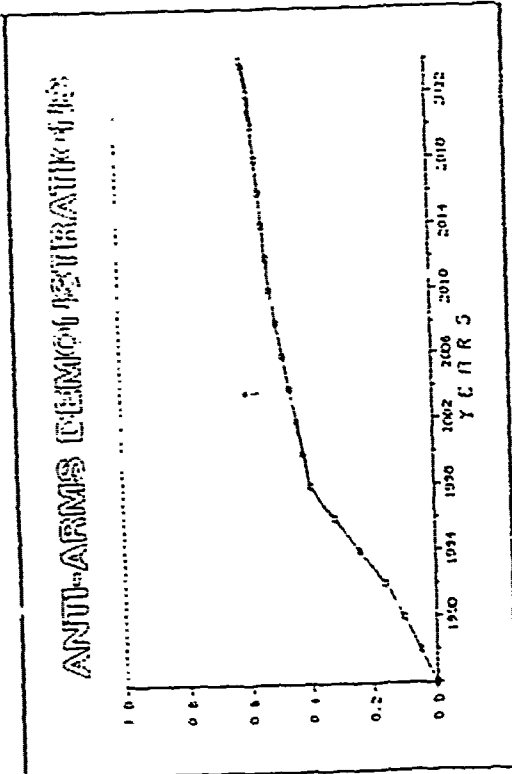
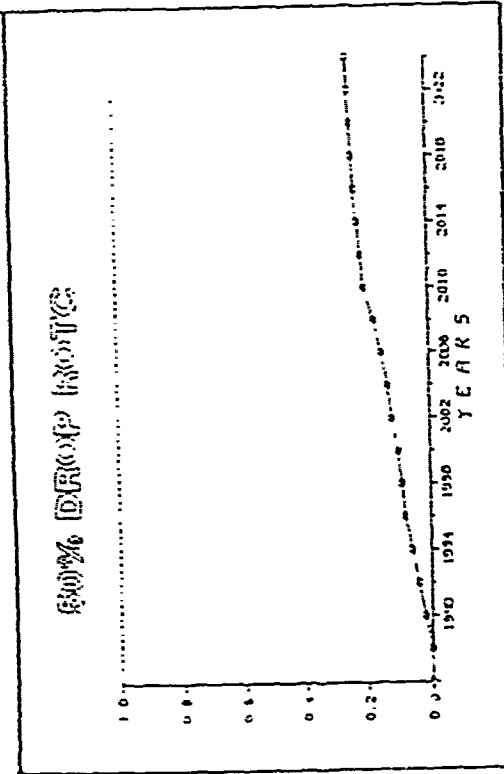
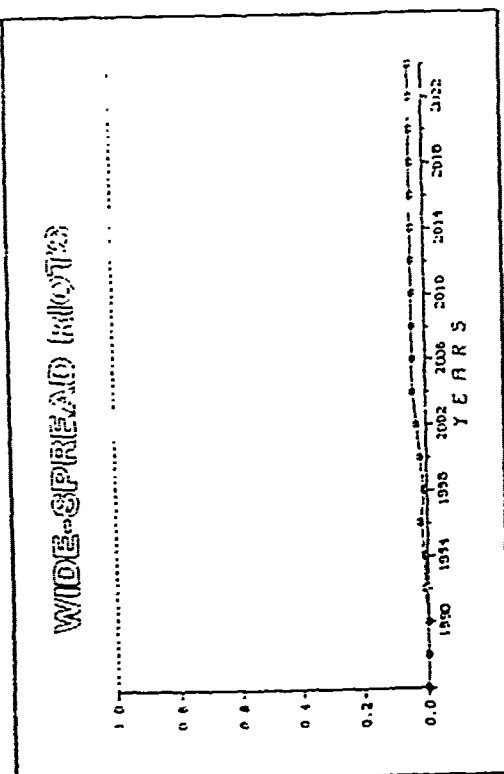
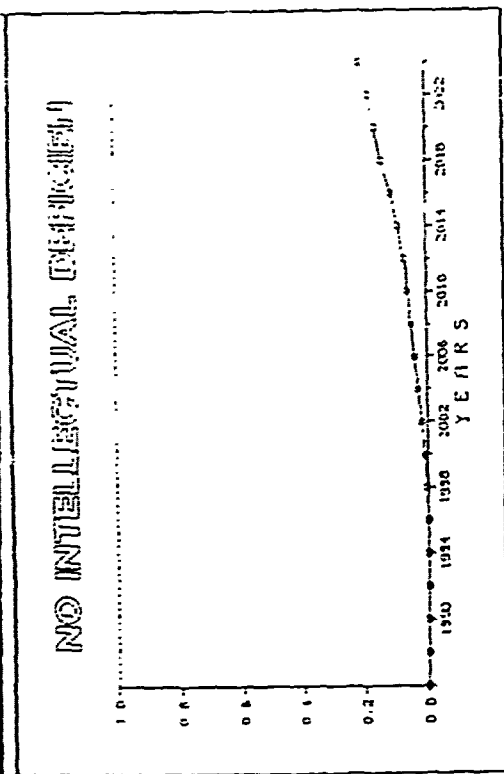
# NOMINAL EVENT DATA



# NOMINAL EVENT DATA

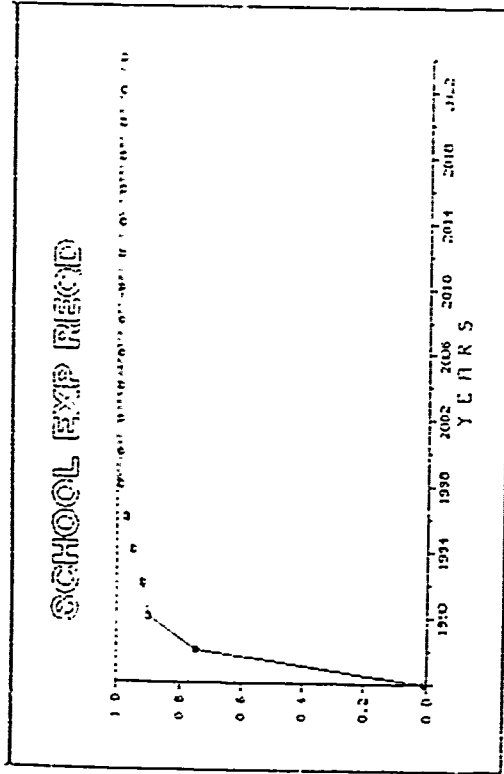
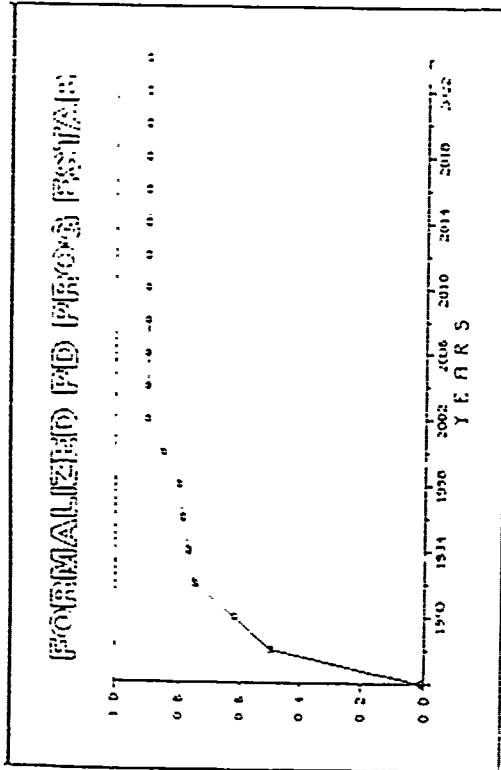
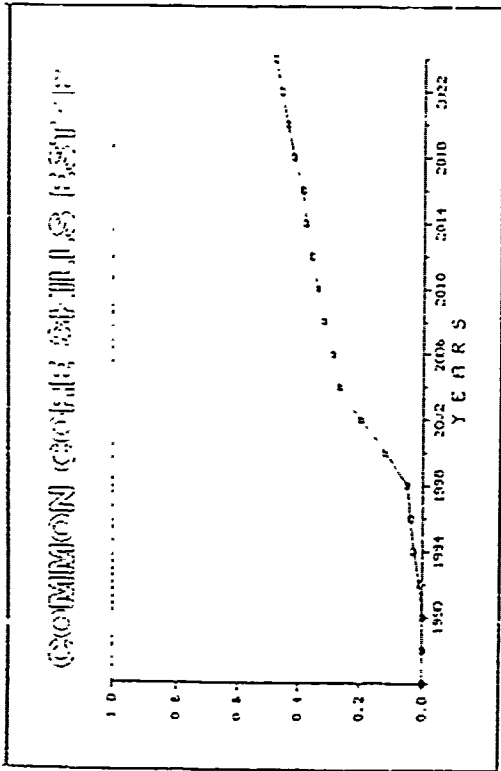
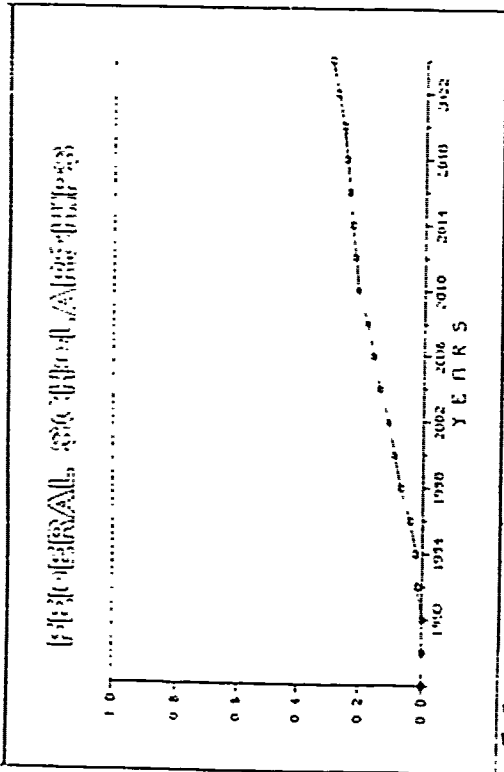


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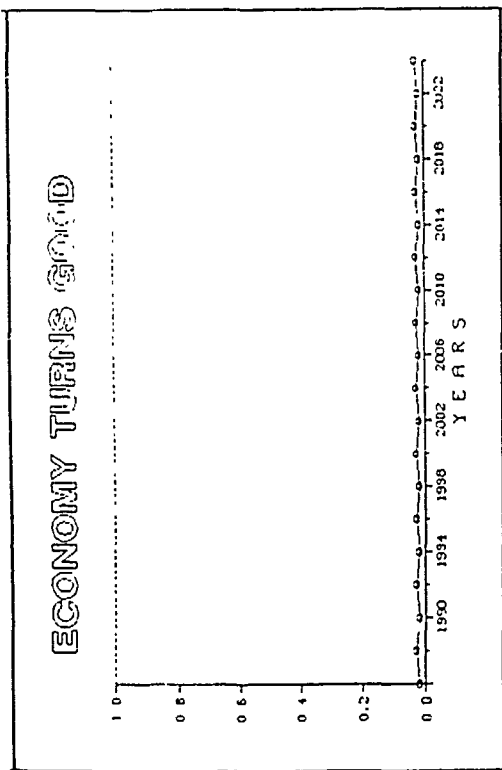




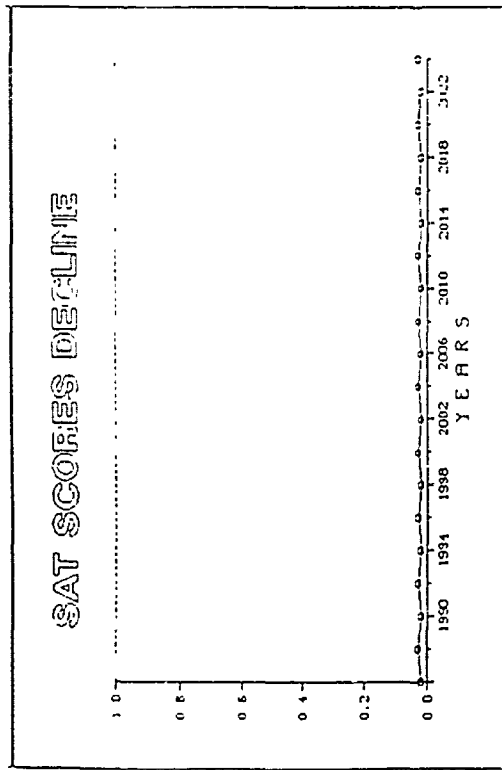
# NOMINAL EVENT DATA



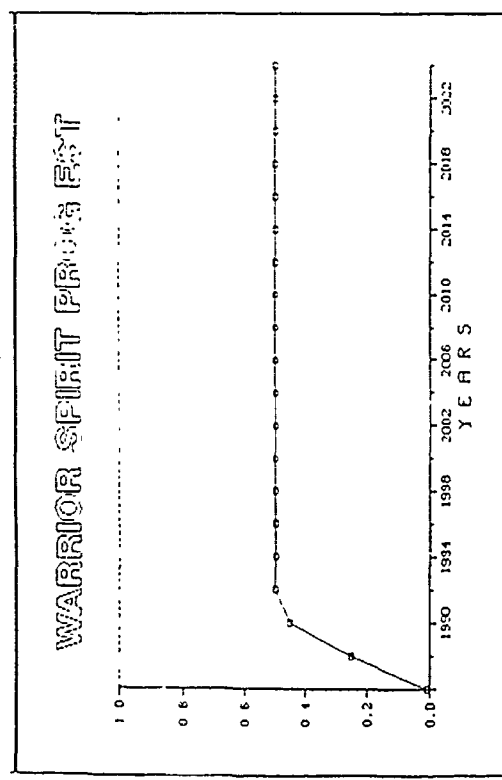
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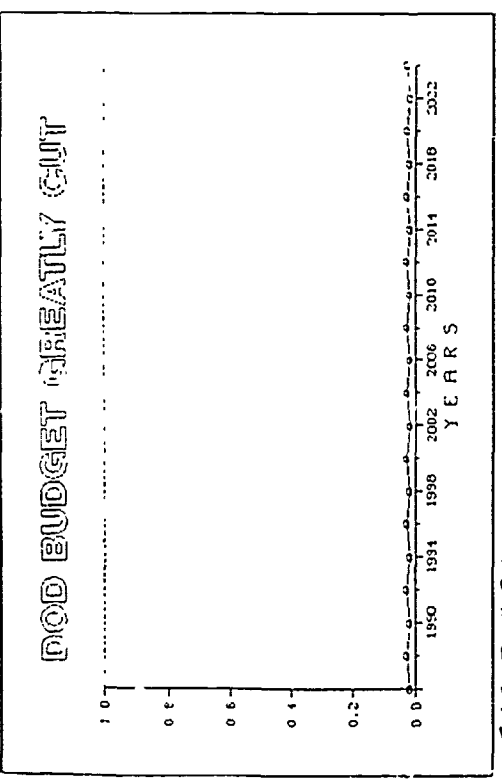
EVENT # 86



EVENT # 80



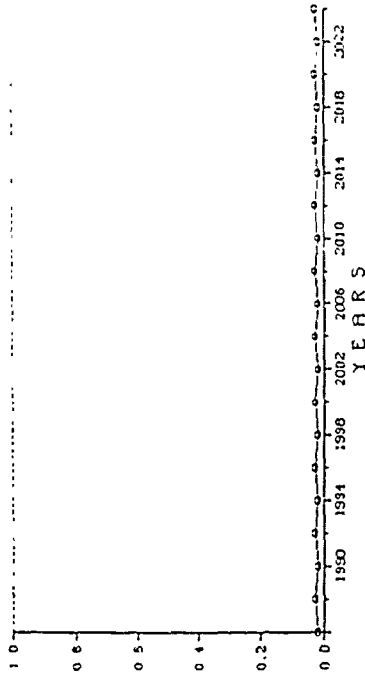
EVENT # 85



EVENT # 87

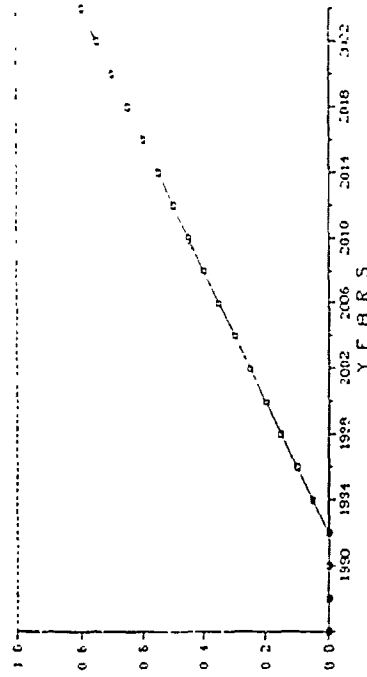
# NOMINAL EVENT DATA

SPARE PARTS REDUCED



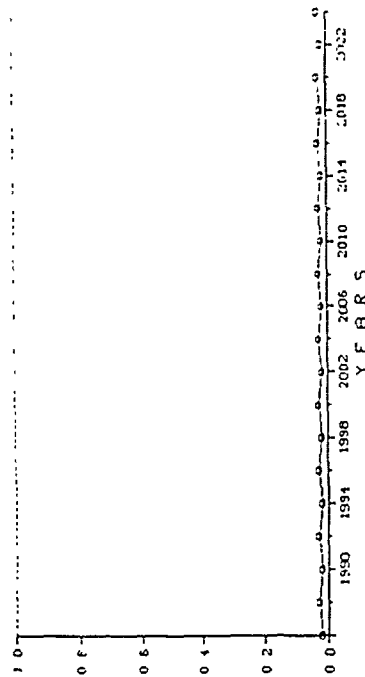
EVENT #90

SOFTWARE REVOLUTION



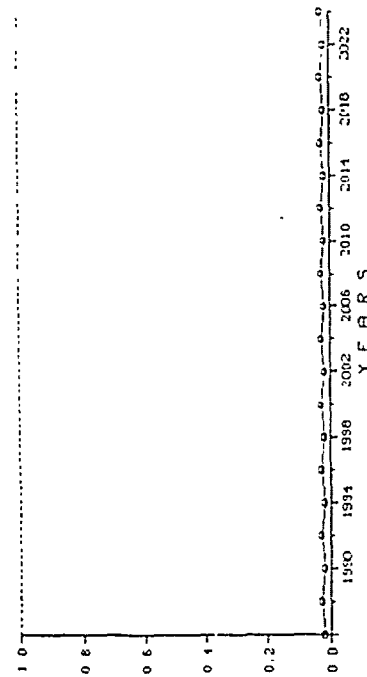
EVENT #92

LIVE AMMO USE REDUCED



EVENT #89

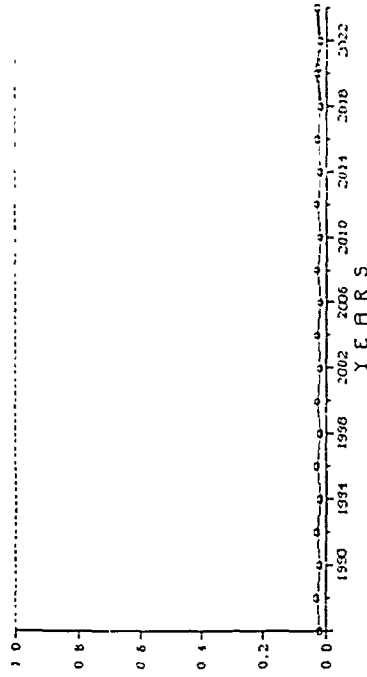
OIL SHORTAGE HITS ARMY



EVENT #91

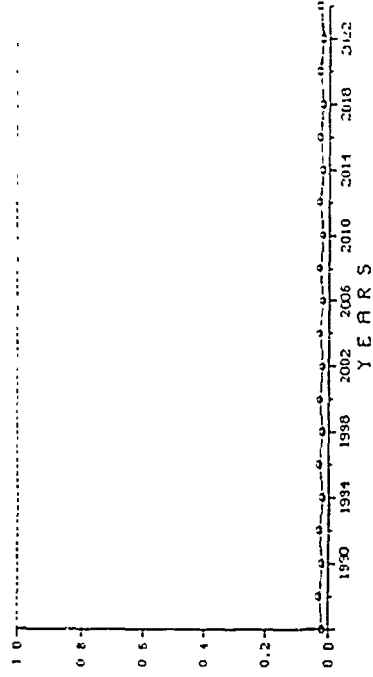
# NOMINAL EVENT DATA

CMD TIME, ONE YEAR



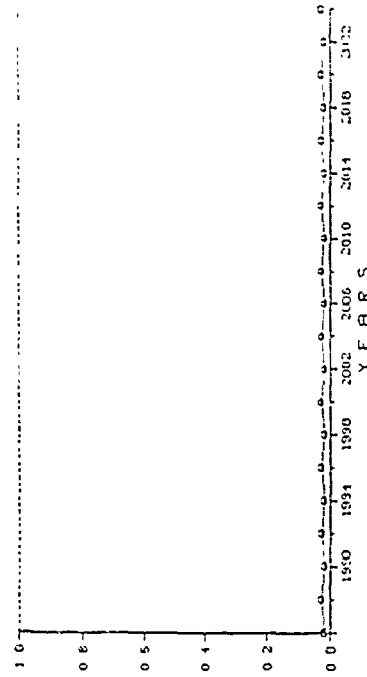
EVENT # 94

QUALITY OFFS TO TGE



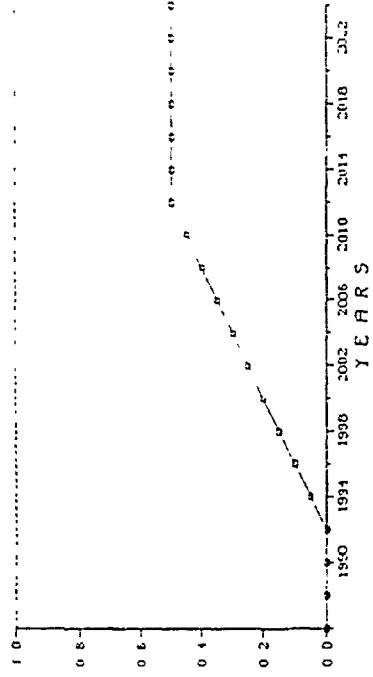
EVENT # 96

OFFICERS CENSURED



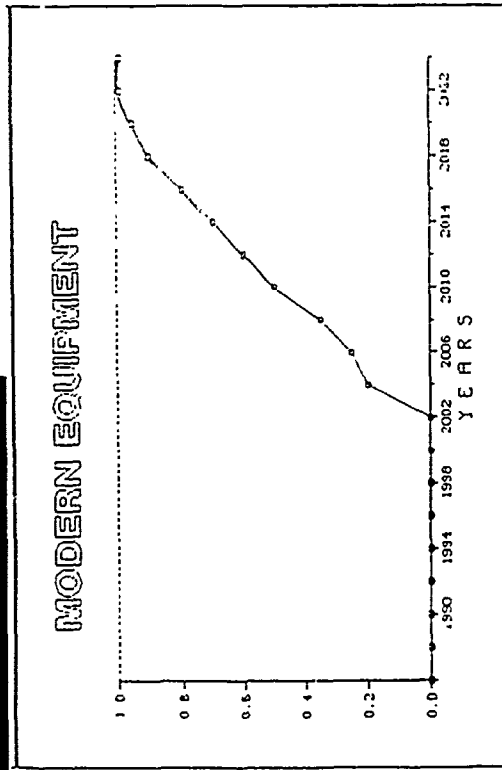
EVENT # 93

EUROPE TOURS SHORTER

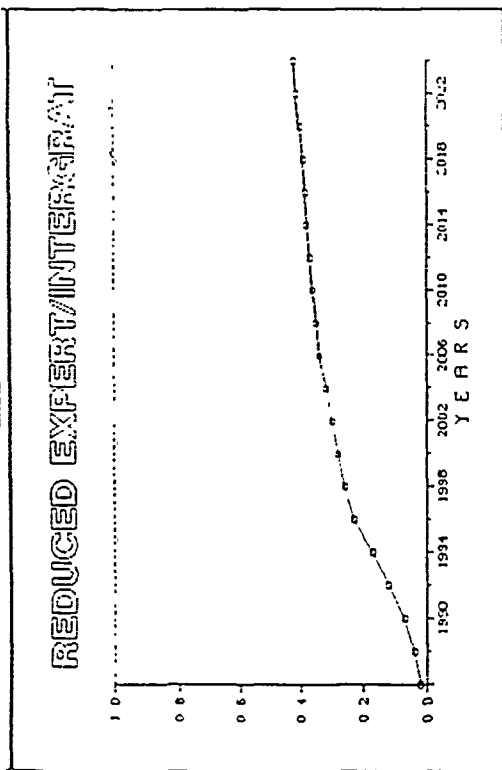


EVENT # 95

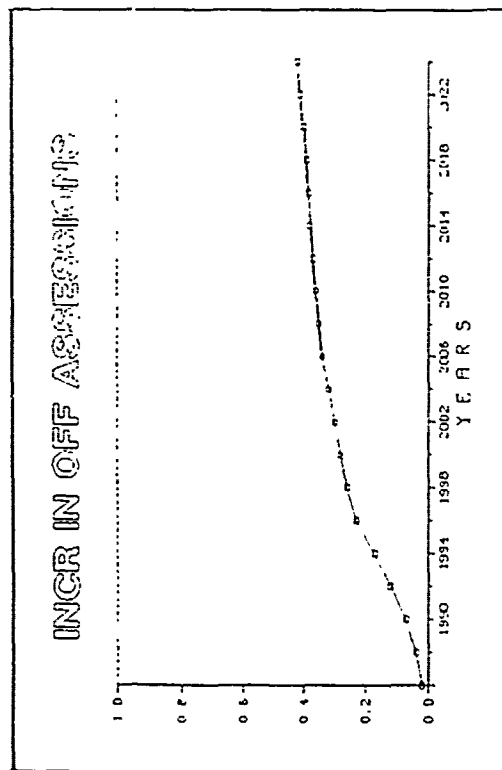
# NOMINAL EVENT DATA



EVENT # 98

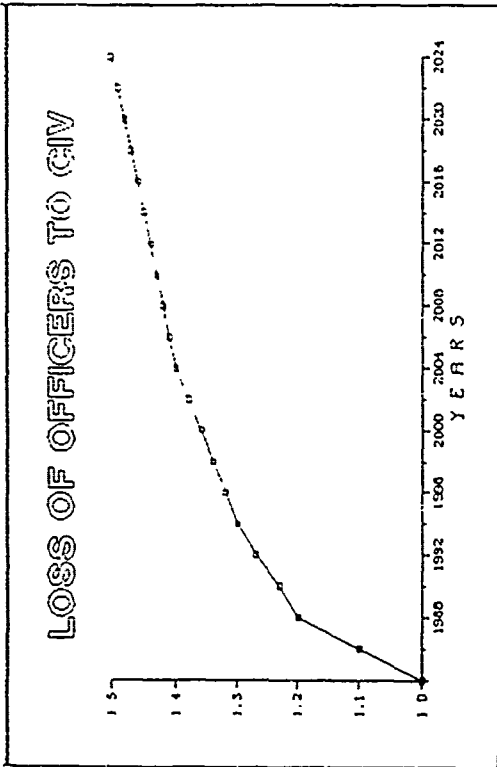


EVENT # 97

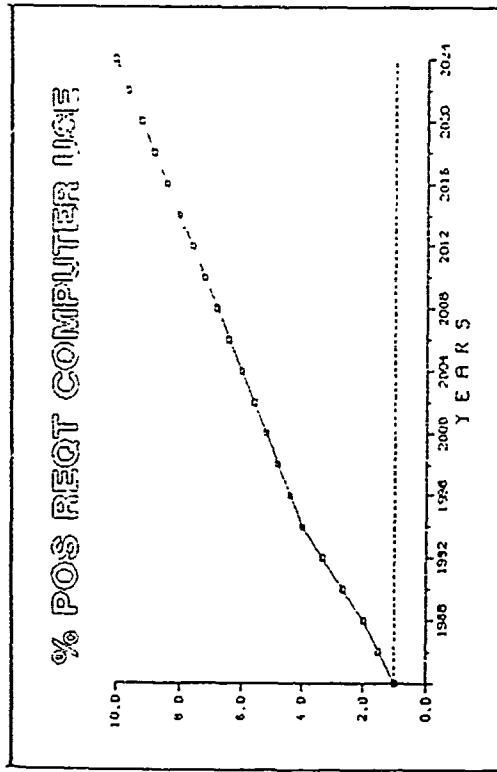


EVENT # 99

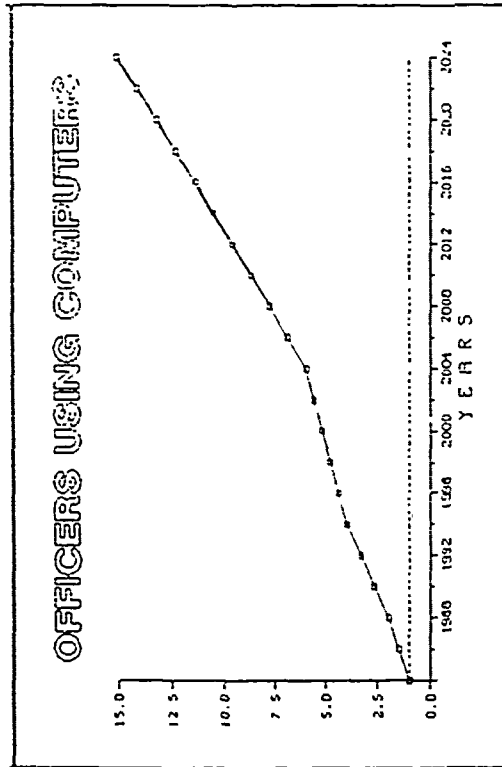
# NOMINAL TREND DATA



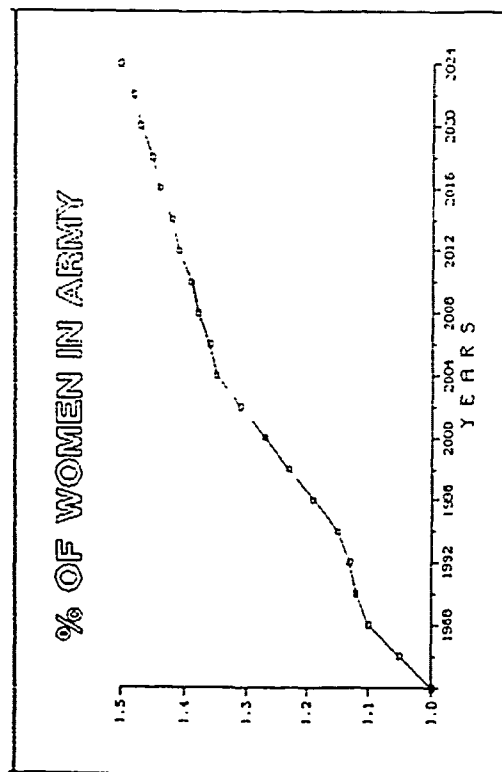
TREND # 1



TREND # 2

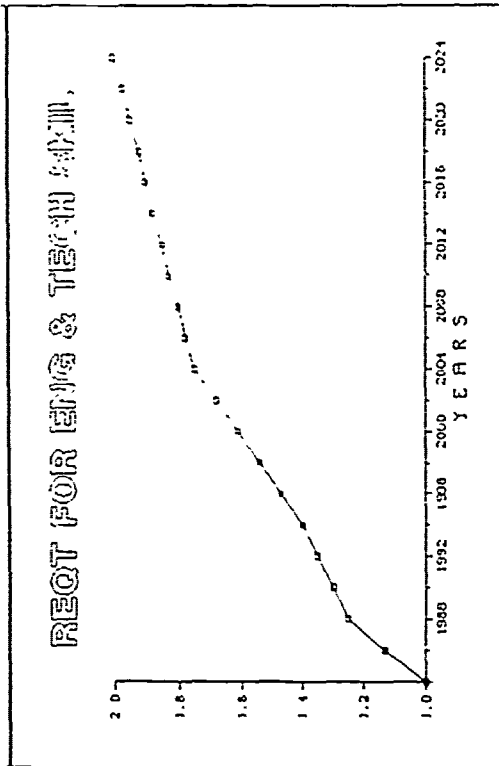


TREND # 3

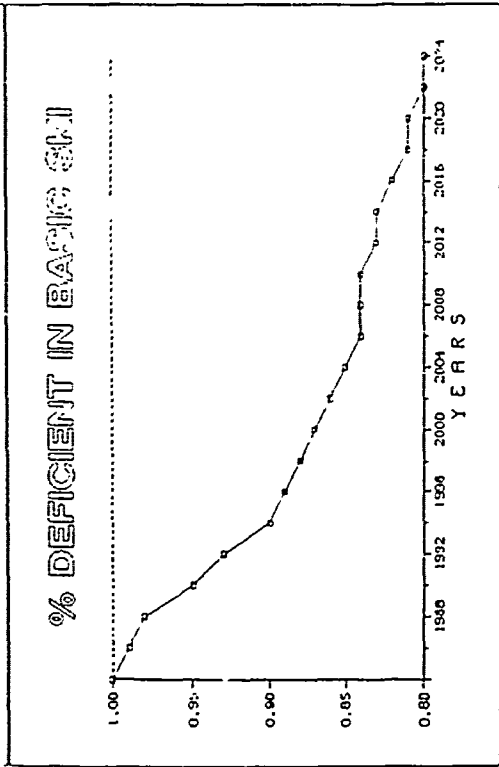


TREND # 4

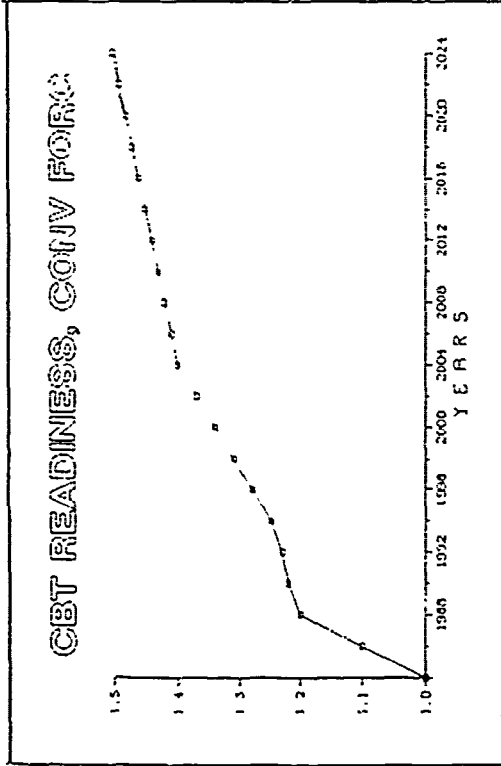
# NOMINAL TREND DATA



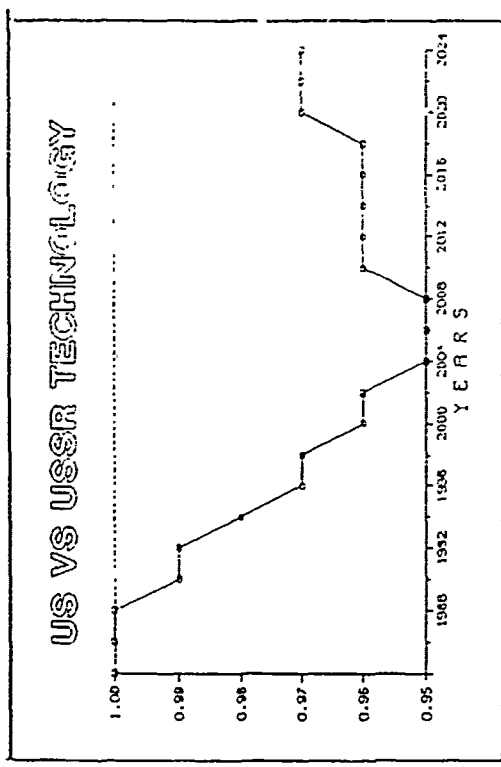
TREND # 6



TREND # 7

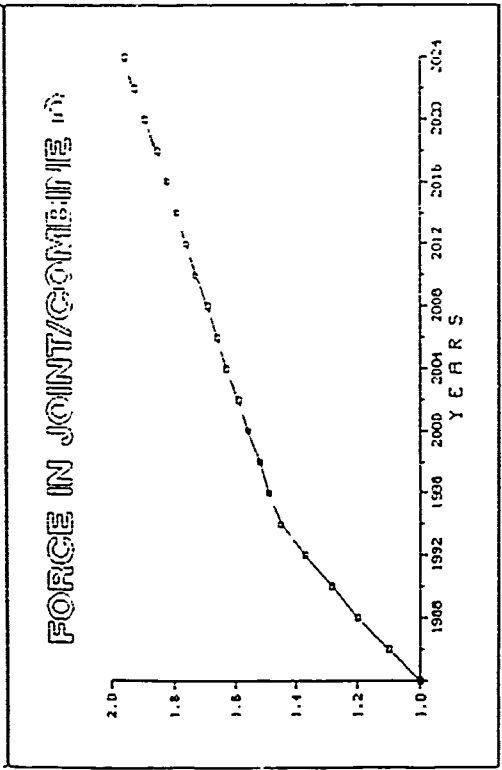


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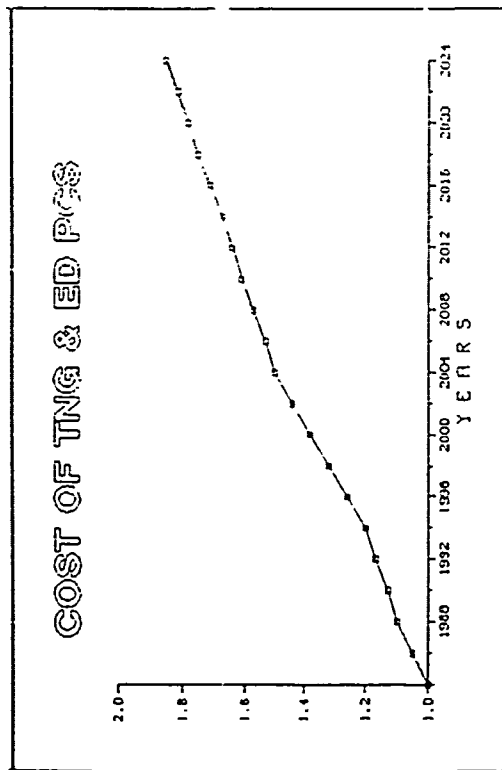


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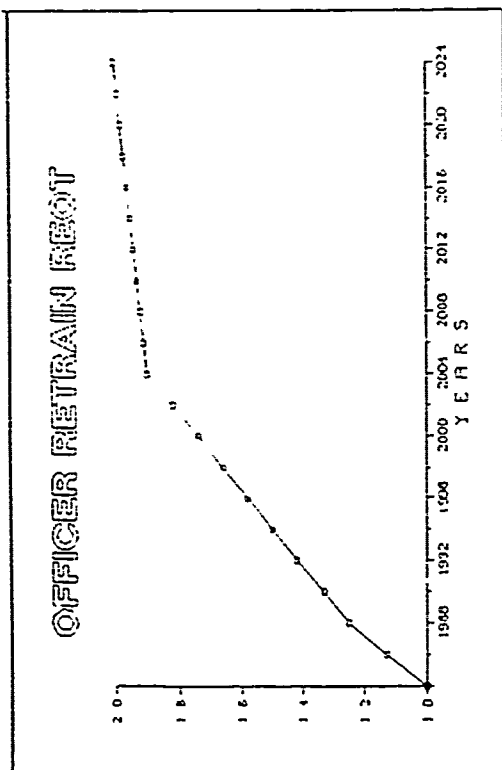
# NOMINAL TREND DATA



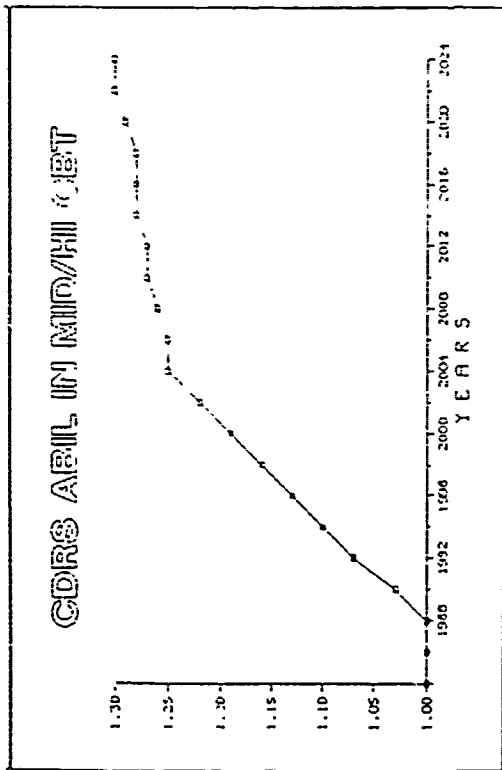
TREND # 29



TREND # 34



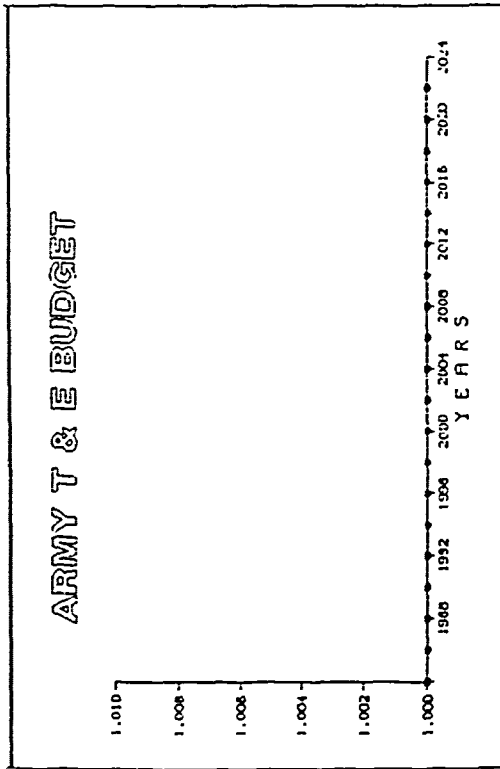
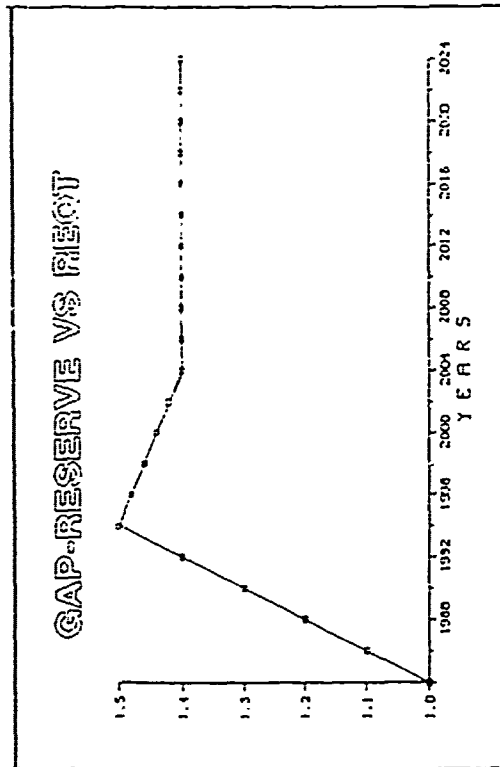
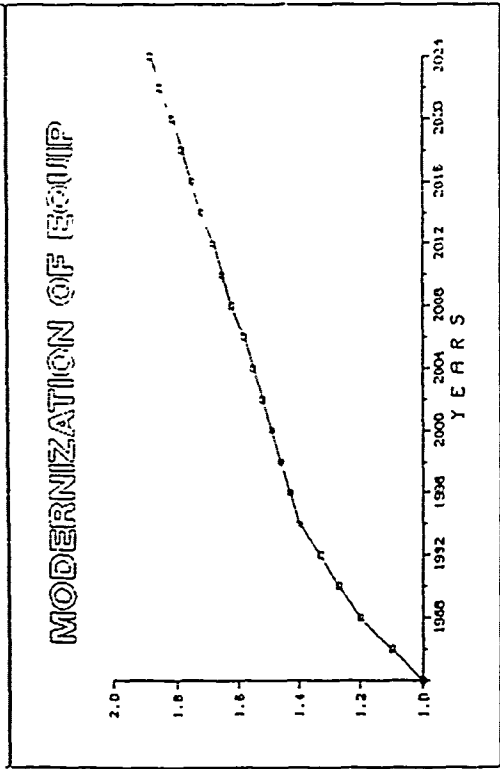
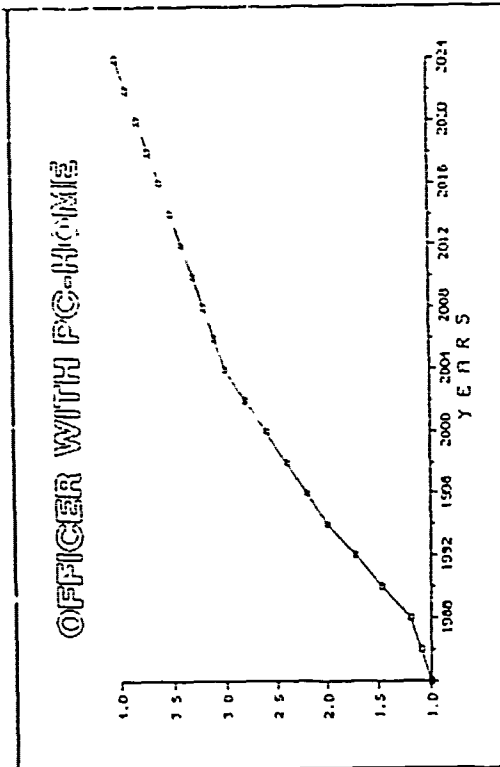
TREND # 20



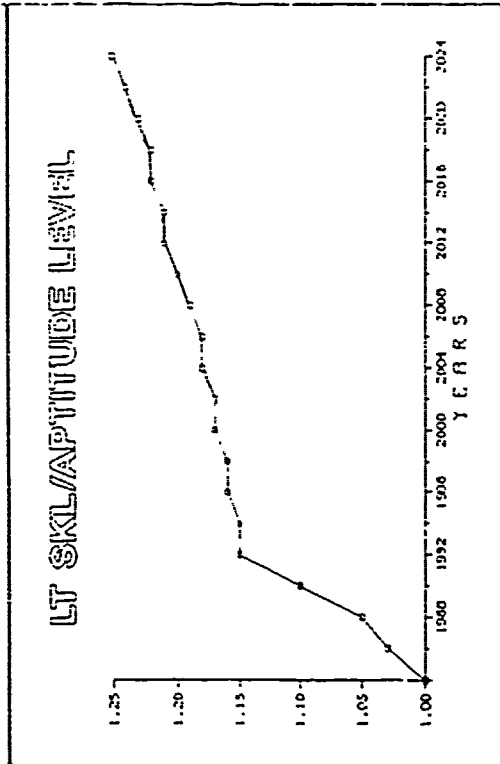
TREND # 33



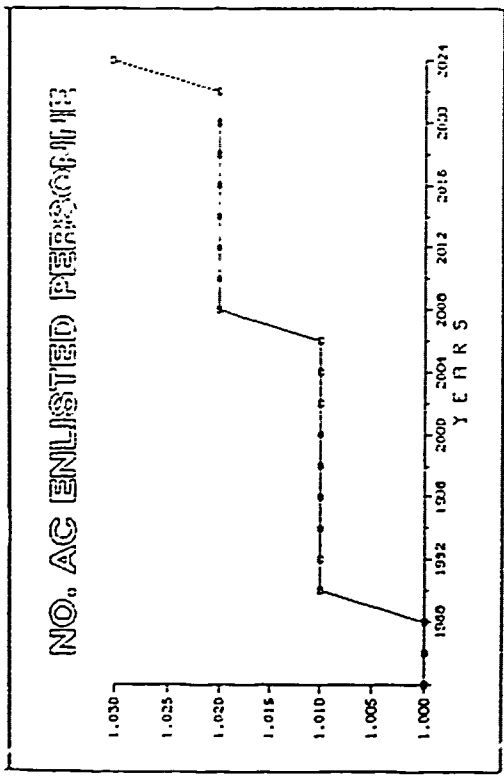
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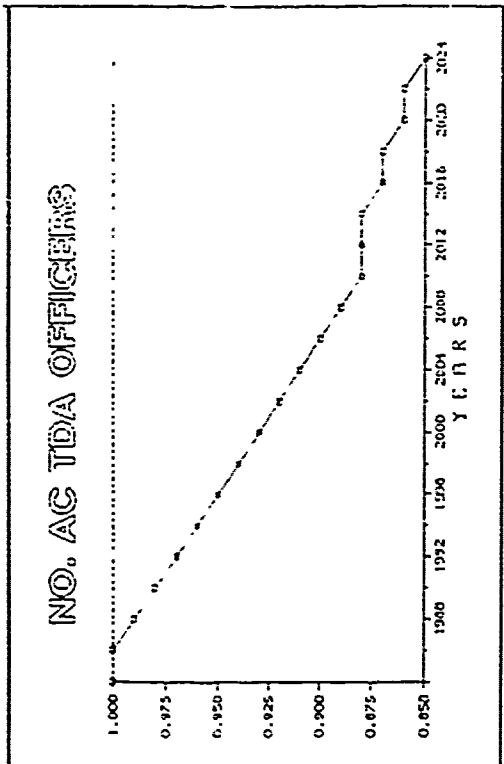
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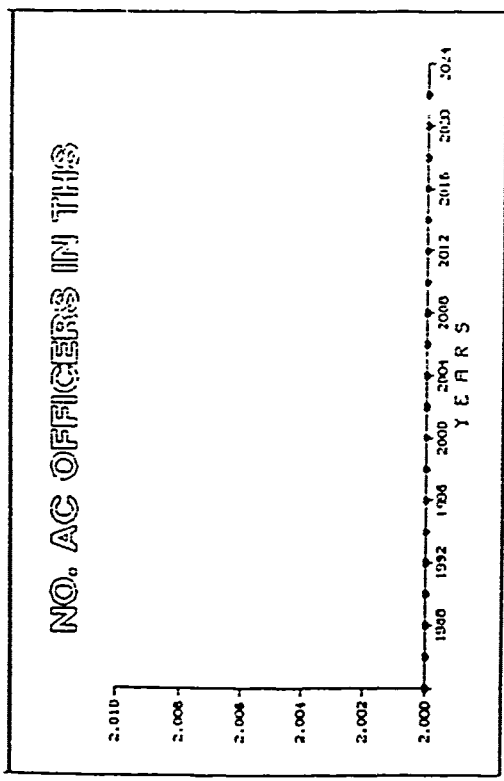
TREND #51



TREND #52

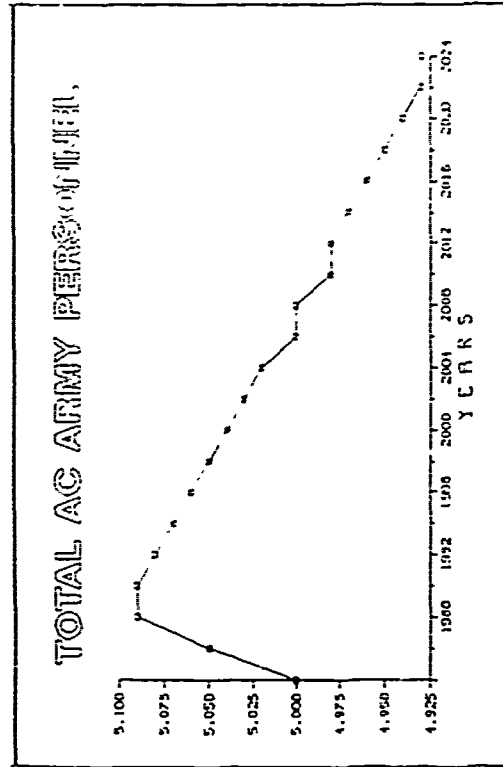
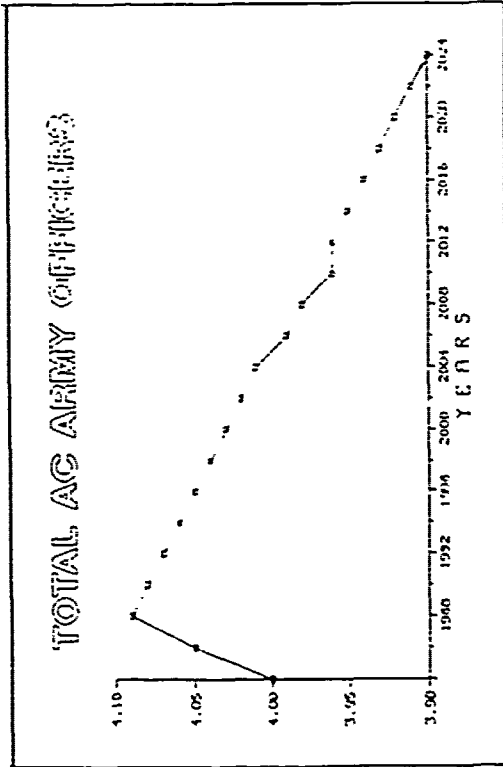
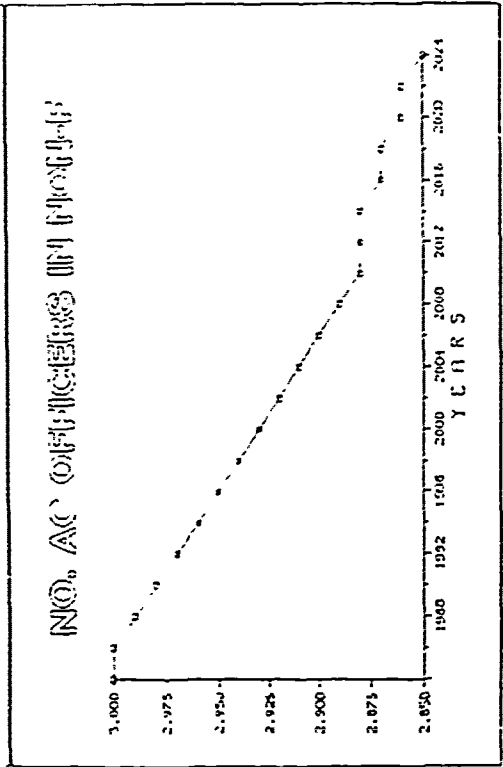
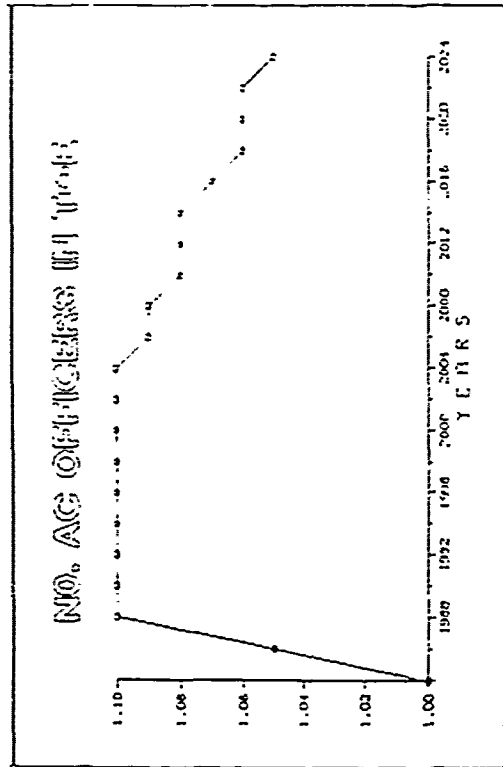


TREND #53

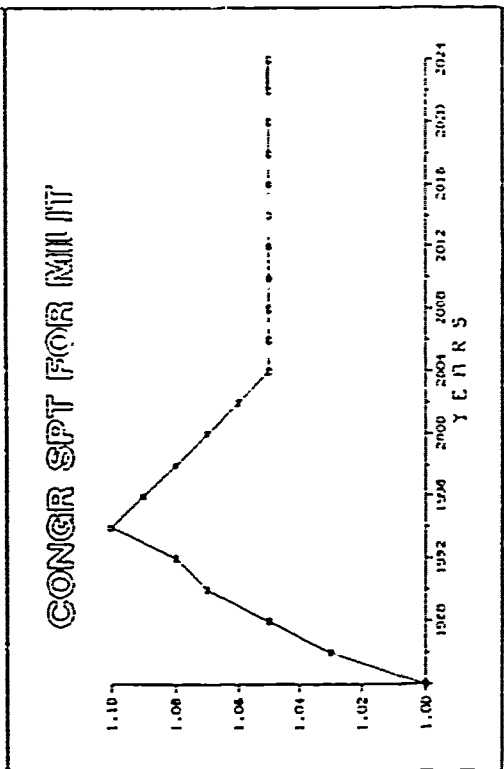
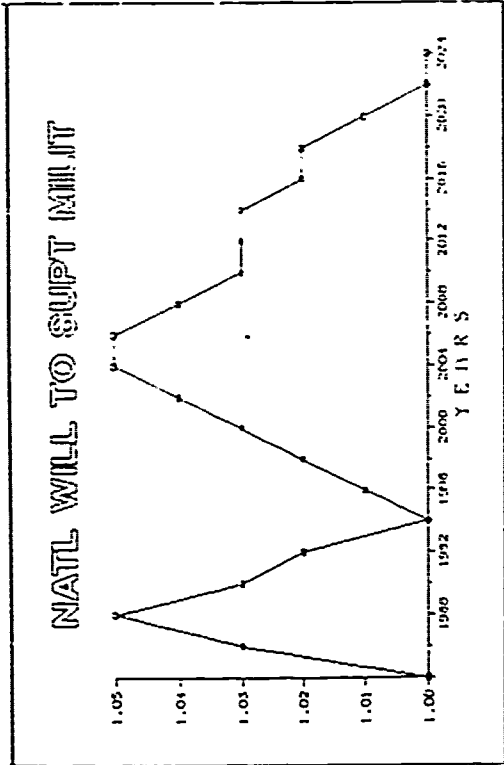
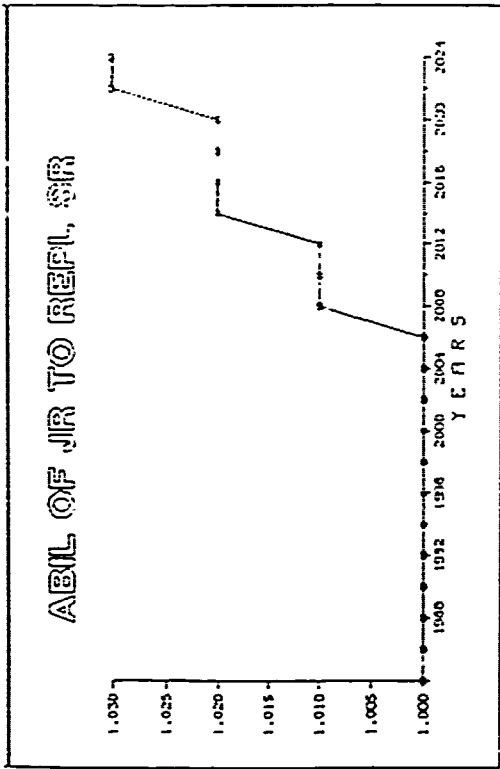
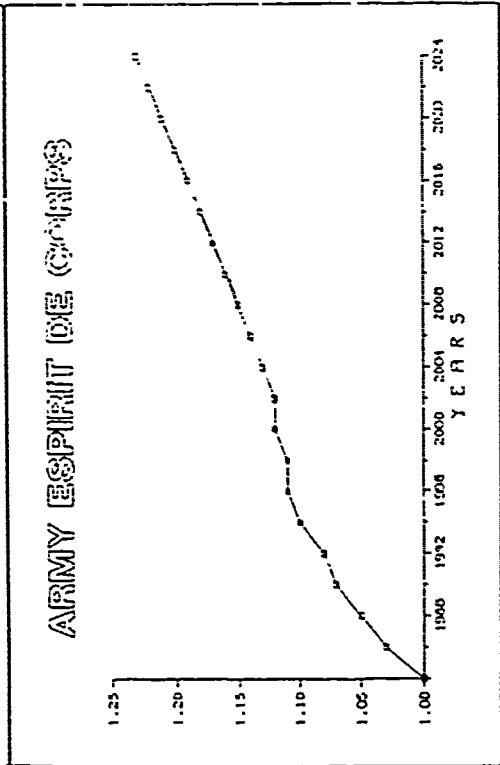


TREND #54

# NOMINAL TREND DATA



# NOMINAL TREND DATA



Authors: LTC Stout/LTC Russell  
Team Chief: COL Dunn

## Appendix 9 to Annex II

### Futures Team Briefing

1. **PURPOSE.** To present the paper copies of the PDOS Futures Team briefing.

2. **DISCUSSION.** Attached is the briefing. This briefing was presented to the Director of the PDOS Study: The Total Warrant Officers Study Group; the ROTC Study Group; the Chief of

Staff, MILPERCEN; and in part to the Vice Chief of Staff, Army.

Tab A — Future Team Briefing on Policy Impact Analysis

Policy Impact Analysis

FOR THE

PROFESSIONAL DEVELOPMENT  
OF OFFICERS STUDY

## BRIEFING OUTLINE

1. FUTURES TEAM TASK
2. FUTURES VARIABLES & INTERACTIONS
3. COMPUTER SIMULATIONS
4. POLICY INSIGHTS
5. POLICY RECOMMENDATIONS
6. METHODOLOGY INSIGHTS
7. METHODOLOGY RECOMMENDATIONS

## FUTURES TEAM TASK

TASK: . ANALYZE THE IMPACT OF THE OPDS  
AND OPDS POLICIES TO 2025.

METHOD:

- . FUTURES LITERATURE REVIEW
- . OPINION SURVEY
- . PDOS - RECOMMENDED POLICY REVIEW
- . COMPUTER SIMULATIONS

RESOURCES:

- . DOD + ARMY LITERATURE & EXPERTS
- . FUTURISTS & LONG-RANGE PLANNERS
- . INTERAX COMPUTER MODEL



## FUTURES TEAM TASK

## DECISION MAKER QUESTIONS :-

- \* WILL MY POLICY MAKE A DIFFERENCE?
- \* WILL IT BE USEFUL?
- \* HOW MUCH?
- \* HOW LONG WILL THE POLICY LAST?
- \* HOW MUCH "POLICY MANAGEMENT" IS NEEDED?
- \* WILL THE POLICY MAKE MY RESPONSIBILITIES/JOB EASIER?



"HOW DO YOU WANT IT—  
THE CRYSTAL MUMBO-JUMBO OR  
STATISTICAL PROBABILITY?"

© 1982 by Sidney Harris—What's So Funny About Computers?

## WHY EVEN DO THIS?

## FUTURE'S TEAM TASK

● HELPS LEADER-MANAGER IDENTIFY POSSIBLE FUTURE ENVIRONMENTS AGAINST WHICH HIS PLANNING CAN TAKE PLACE

● HELPS LEADER-MANAGER VISUALIZE THE EFFECT OF HIS POLICY ON THE SYSTEM HE HAS CREATED . . . THROUGH TIME

## THIS COMPUTER SIMULATOR . . .

- ⊖ HELPS IN POLICY IMPACT ANALYSIS.
- ⊖ HELPS THE DECISION MAKER TO MAKE CONNECTIONS HE WOULD NOT ORDINARILY MAKE.

The PDOS Futures Process

- Read Extensively.
- Events.
- Trends.
- Cross-Impacts.
- Computer Simulations.

## SOURCES

- \* TAP/EPA
- \* ARMY Z1
- \* LOG Z1
- \* PA 2002
- \* OPMS: "LOOK INTO THE FUTURE"
- \* ARMY LONG-RANGE APPRAISAL
- \* ARROYO: "ISSUES UNDERLYING ARMY POLICY"

- \* SSI, AWC
- \* CENSUS BUREAU
- \* CONGRESS
- \* MEGATRENDS
- \* "DIALOG"
- \* INTERVIEWS
- \* USAF: ALTERNATIVE FUTURES PROTECT, JUNE, 1984
- \* RETO

# EVENT & TREND CATEGORIES

\* INTERNATIONAL

\* POLITICAL

\* TECHNOLOGICAL

\* SOCIAL

\* DoD

\* ARMY (Incl EDUCATION)

FUTURES VARIABLES & INTERACTIONS

EVENTS (79)

TRENDS (65)

CROSS-IMPACTS:      EVENTS ON EVENTS (325)  
                                    EVENTS ON TRENDS (477)

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## FIGURES VARIABLES & INTERACTIONS

### EVENTS

- "CONFLICT" EVENTS (6)
  - "DOMESTIC / INTERNAL CONTROL" EVENTS (5)
  - "ENVIRONMENTAL" EVENTS (13)
  - "EXTERNAL - TO - PDOS" POLICY EVENTS (23)
  - "PDOS - RECOMMENDED" POLICY EVENTS (11)
  - "NON - PDOS - RECOMMENDED PROFESSIONAL DEVELOPMENT"  
POLICY EVENTS (7)
- 
-

# FUTURES VARIABLES & INTERACTIONS

## CONFLICT EVENTS

- E-8: Unauthorized Nuclear Launch.
- E-11: Reserves Mobilized.
- E-13: US in Mid-/High Intensity Conventional War.
- E-15: US in Low-Intensity Conventional War.
- E-16: US in Bio/Chemical War.
- E-58: US Protects Foreign Supplier.



# FUTURE VARIABLES & INTERACTIONS

## DOMESTIC / INTERNAL CONTROL EVENTS

- E-9: Army to Control Riots.
- E-35: Mexico Turns Communist.
- E-49: Army Patrols Mexico/US Border.
- E-66: Army Protects Domestic Facilities/Services.
- E-80: Wide-Spread Riots.

## FUTURES VARIABLES & INTERACTIONS

### ENVIRONMENTAL EVENTS

- E-18: Life-Span Increased.
  - E-29: Improvements In Human Memory Are Developed.
  - E-37: France Rejoins NATO.
  - E-41: 70% College Students Use Computers.
  - E-53: Anti-Military Media Campaign Developed.
  - E-55: Corporate Scholarships Established.
  - E-57: Bachelors and Masters Degrees By Computer Are Available.
  - E-63: Genetic Engineers Develop Inexpensive Food Source.
  - E-71: 5th Generation Computer Developed By Japan.
  - E-75: 3d World Country Led By Irrational Government Gets Nuke.
  - E-77: 50% Drop in ROTC.
  - E-70: Educational Deficiencies Eliminated In Public Schools.
  - E-79: Massive Anti-Arms Demonstrations Occur In Western World.
- 
-

## FUTURES VARIABLES & INTERACTIONS

### EXTERNAL - TO - PDOS POLICY EVENTS

- E-2: GI Bill Reinstated.
- E-10: Retirement Changed To 30 Year Minimum.
- E-12: AC LtCol's Command RC Battalions.
- E-14: Role of Women Made Unrestricted Except In Inf/Arm/Cannon  
FA.
- E-17: New Aircraft Transporter Fielded (NATO In 90 Minutes).
- E-22: Significant Number Of Other Services In The Army.
- E-26: 3 Year Command Tours.
- E-27: International Military Force Established (US Is Part).
- E-28: Army 21 Adopted.
- E-30: US Withdraws From NATO.

# FUTURES VARIABLES & INTERACTIONS

## PDOS-RECOMMENDED POLICY EVENTS

- E-3: MQS Tests Established.
- E-33: Army Establishes Pre-Commissioning Entrance Requirements.
- E-46: Army Installs Extensive Computer Based Instruction (CBI).
- E-47: Assessment Centers Established.
- E-48: Self-Assessment Testing Established.
- E-53: Competency Tests Established.
- E-70: Additional Electronic Wargames Fielded.
- E-82: Common Core Skills Established.
- E-83: Formalized Professional Development Program Established.
- E-84: Required School Experience.
- E-85: Warrior Spirit Program Established.

EXTERNAL - TO - PDOS  
POLICY EVENTS

CONTINUED

- E-31: Army Adopts Line/Staff Concept.
- E-36: Lateral Entry Of Civilians Required.
- E-38: US Withdraws Significant Number of Troops.
- E-39: Mandatory National Service Mandated By Congress.
- E-40: Materiel Acquisition Time Significantly Reduced.
- E-43: Merit Pay For Officers Adopted.
- E-44: Vested Retirement System Established.
- E-45: Depression (15% Unemployment For 4 Years).
- E-50: Reserves Assigned NATO Mission (US Is Home Station--AC Army Returns Home).
- E-51: US Military Forces Combined.
- E-62: Rapid Learning Techniques Developed/Taught In Army Schools.
- E-74: US Space Department Created.
- E-81: Federal Scholarship Program Established.

## FUTURES VARIABLES & INTERACTIONS

### NON-PDOS - RECOMMENDED PROFESSIONAL DEVELOPMENT POLICY EVENTS

- F-5: Measure of Officer Potential Developed/Used.
- E-6: Abilities/Requirements Match Developed/Used.
- E-42: Electronic Data Base Installed.
- E-54: "PCs for Officers" Contract.
- F-64: Dual Language Requirement.
- F-65: Decision Support System (DSS) Fielded.
- F-73: Super-Powerful Hand-Held Computers Given to Officers.



# FUTURES VARIABLES & INTERACTIONS

EACH EVENT HAS A CUMULATIVE PROBABILITY  
OF OCCURRENCE BETWEEN 1984 - 2025.

EXAMPLE:  
ARMY 21

1986	1988	1990	1992	1994	1996
.0	.0	.05	.1	.15	.2

ADDED:

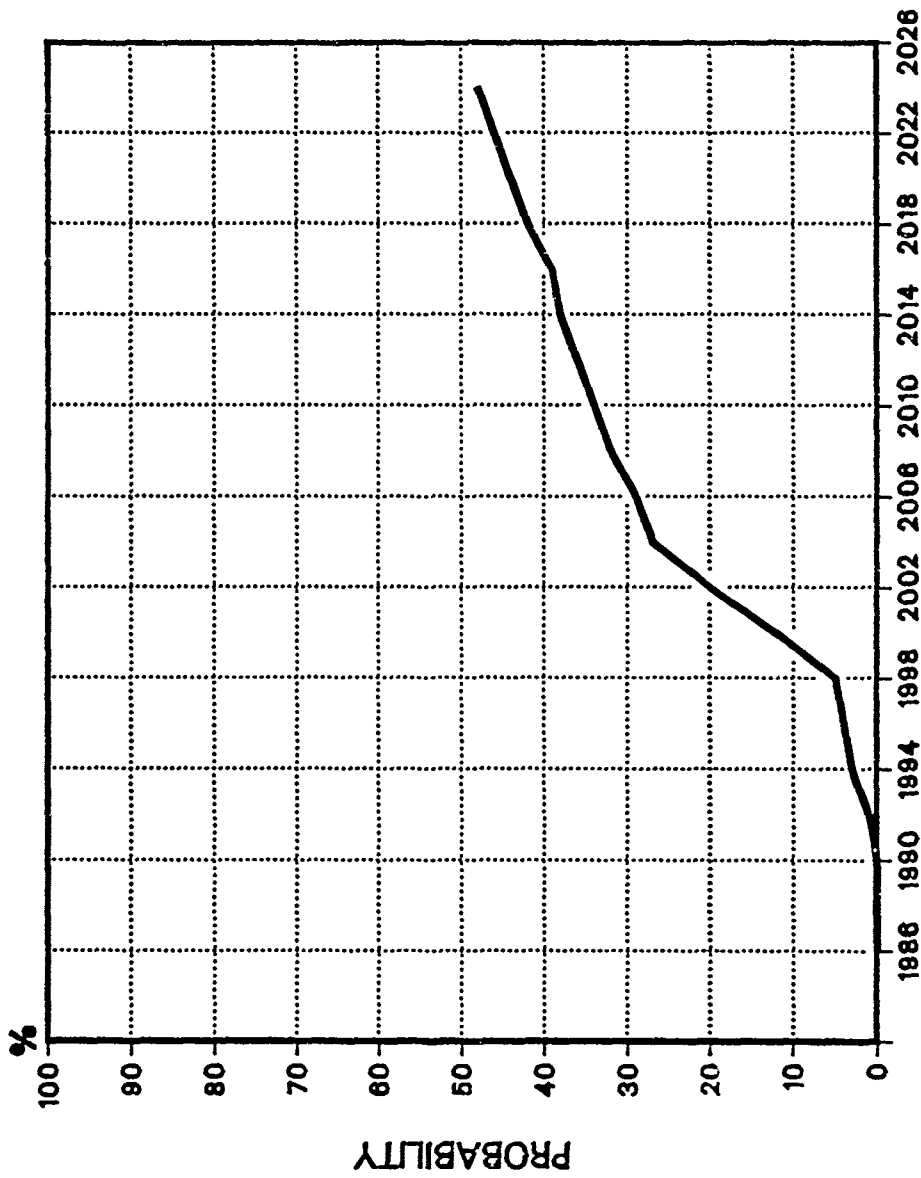
1998	2000	2002	2004	2006	2008
.4	.8	.9	.99	.99	.99

2010	2012	2014	2016	2018	2020
.99	.99	.99	.99	.99	.99

2022	2024
.99	.99

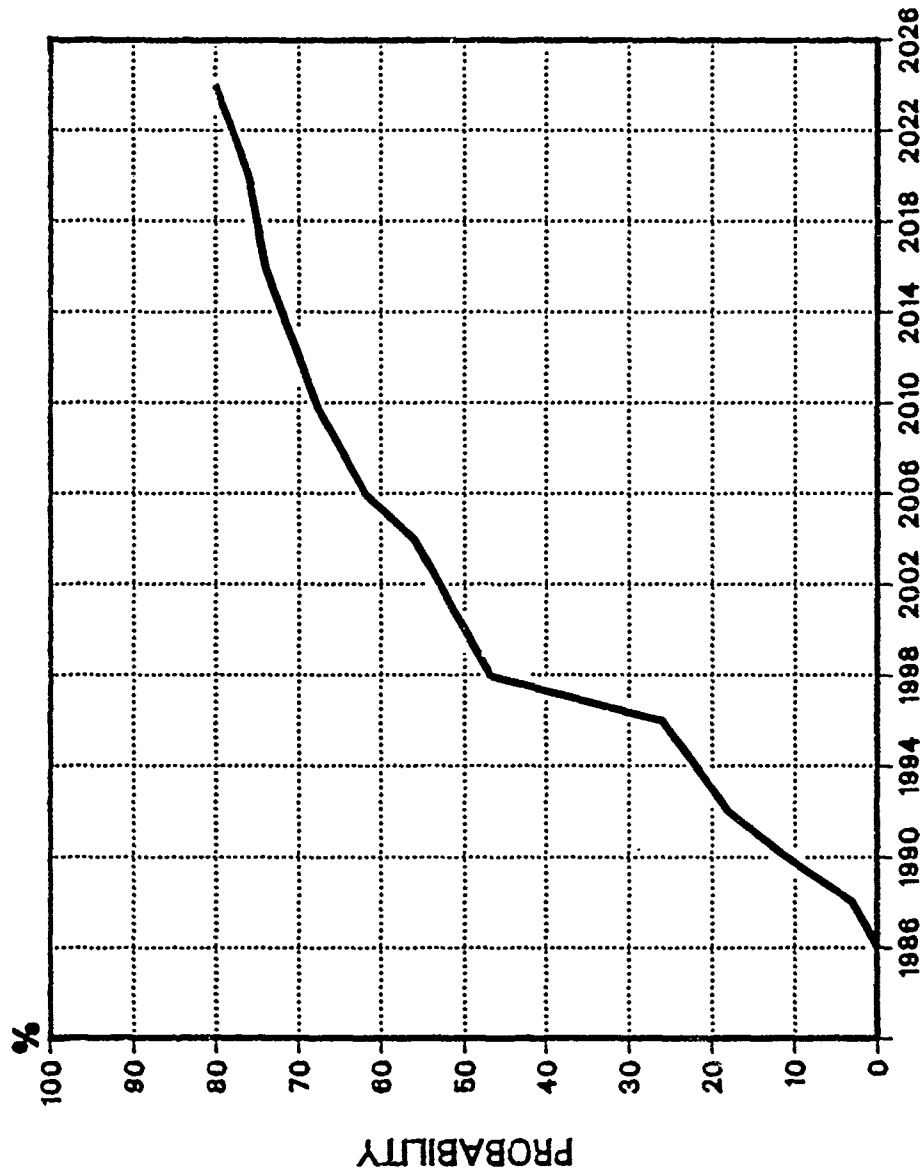
# EVENT

## WO1 THRU COL RQRD TO TAKE PERIODIC SKILL QUALIFICATION TESTS



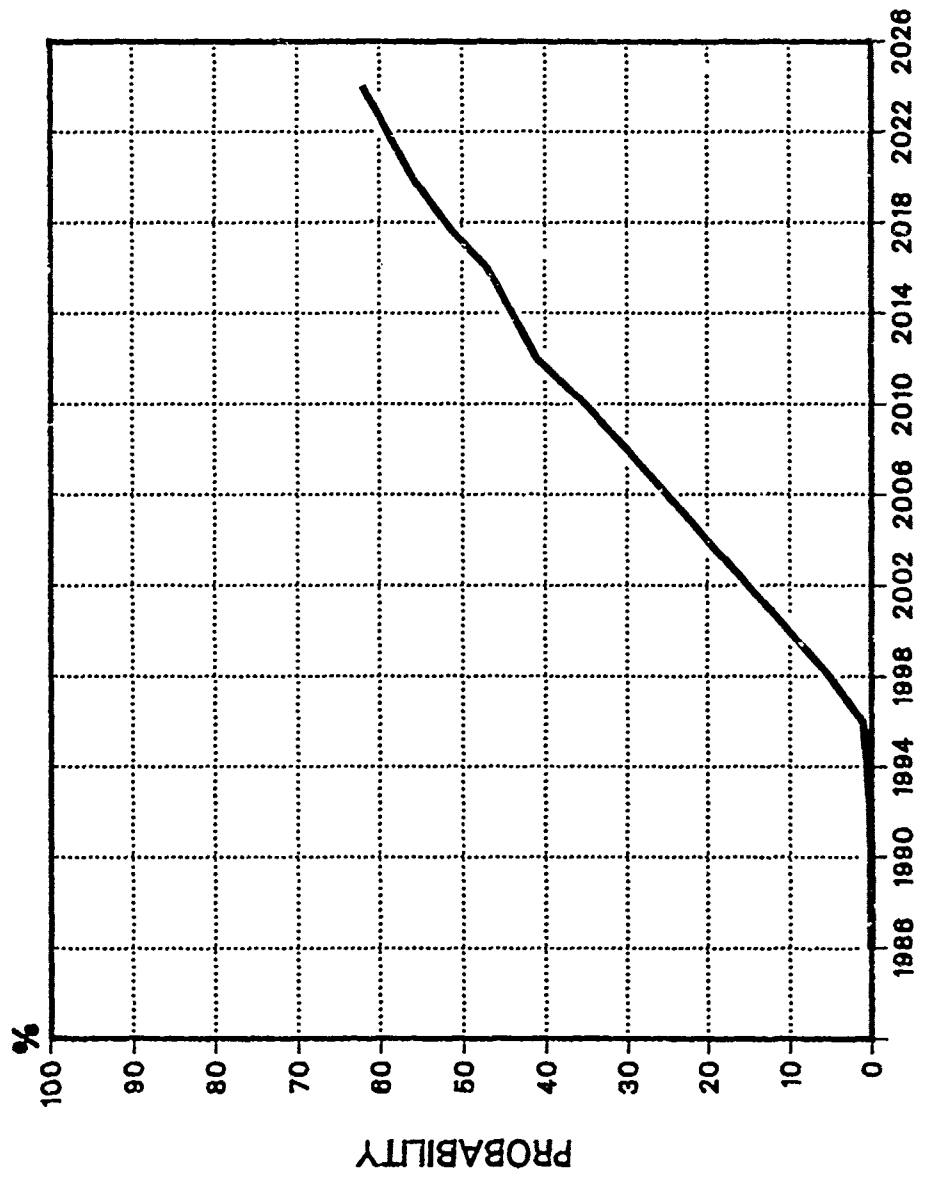
# EVENT

CURRICULUM REQUIRES MAJORITY OF COLLEGE STUDENTS TO USE COMPUTERS

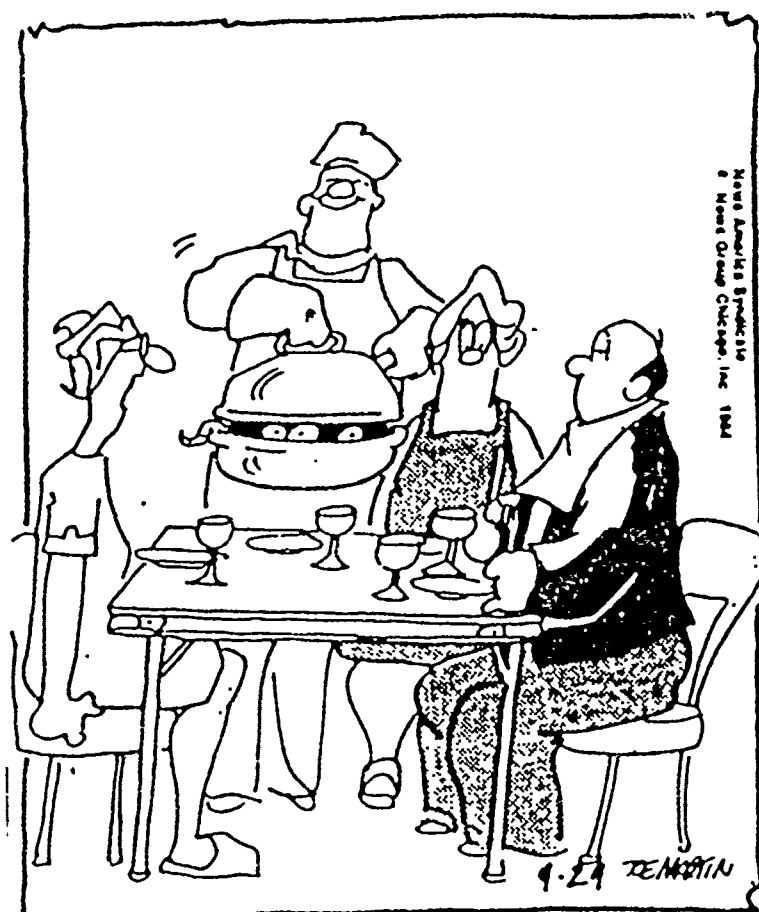


# EVENT

## CONGRESS MANDATES MILITARY OR CIVILIAN NATIONAL SERVICE

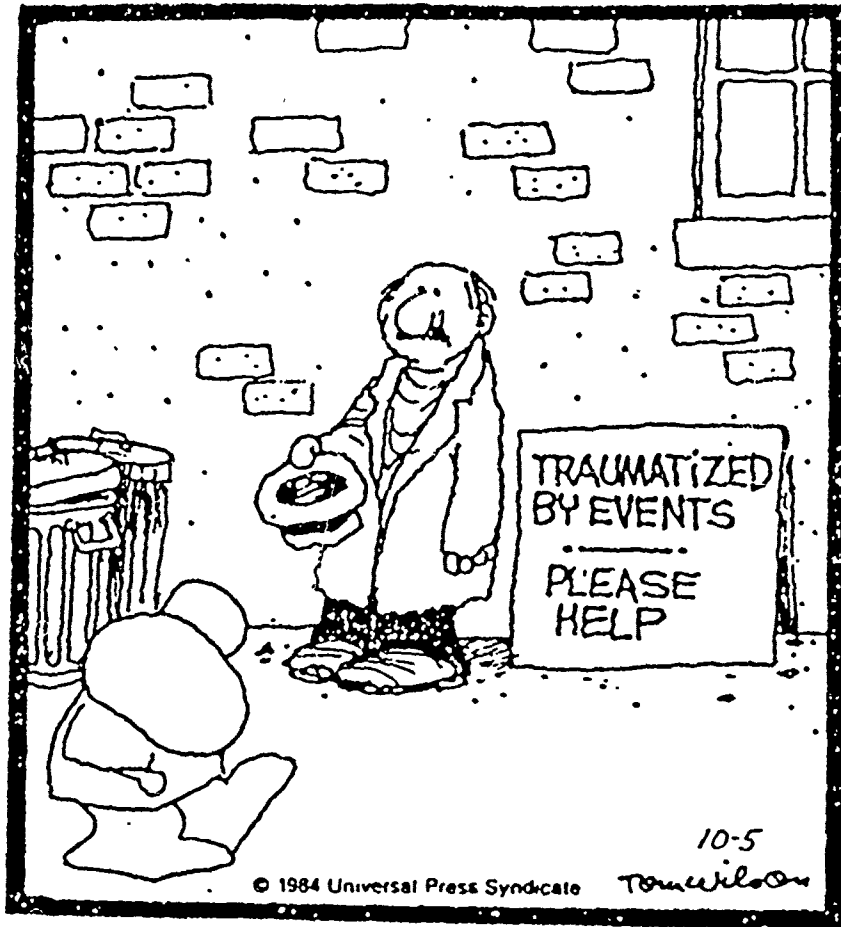


# WILLY AND ETHEL



"FLOYD'S HOBBIES ARE GENETIC ENGINEERING AND  
FOOD... GET READY TO DUCK "

ZIGGY



## FUTURES VARIABLES & INTERACTIONS

### TRENDS

- o PDOS SYSTEM-WIDE ISSUES (8)
  - o PDOS PERFORMANCE MEASURES (12)
  - PDOS PERFORMANCE INDICATORS (12)
  - PDOS PERFORMANCE INDICATORS ON SPREAD-SHEET PROGRAM (18)
  - o OTHER TRENDS
- 
-

## FUTURE VARIABLES & INTERACTIONS

PDOS SYSTEM-WIDE  
ISSUES = TRENDS

- T-68: Professional Values.
- T-69: Warrior Spirit.
- T-70: Leader-Mentor.
- T-71: Decision Making Skills.
- T-75: Art and Science of War.
- T-76: Expert-Integrator.
- T-80: Common Shared Operational Language.
- T-81: Self-Development.



## Futures Variables & Interactions

POOs PERFORMANCE  
MEASURES = TRENDS

- T-16: Combat Readiness of the Conventional Force.
- T-21: Computers/Communications in Combat---Effective Use.
- T-22: Computers/Communications in Support---Effective Use.
- T-23: Computers/Communications in Training/Education---Effective Use.
- T-43: Commanders' Ability in Mid-/High-Intensity Combat.
- T-47: Gap Between Reserve Officer Capability and Requirements.
- T-66: Army Esprit De Corps.
- T-67: Ability of Juniors to Replace Seniors.
- T-72: National Will to Support the Military.
- T-73: Congressional Support for the Military.
- T-78: Army Officer Skill Proficiency.
- T-83: Army Officer - Threat Army Officer Skill Proficiency.

# FUTURES VARIABLES & INTERACTIONS

EACH TREND HAS AN "INDEX OF SHIFT"  
FROM AN ASSUMED BASELINE OF 1.0 IN 1984

EXAMPLE: 1984 1986 1988 1990 1992 1994

% POSITIONS

1.0 1.5 2.0 2.67 3.33 4.0

REQUIRING

1996 1998 2000 2002 2004 2006

4.4 4.8 5.2 5.6 6.0 6.4

COMPUTER USE:

2008 2010 2012 2014 2016 2018

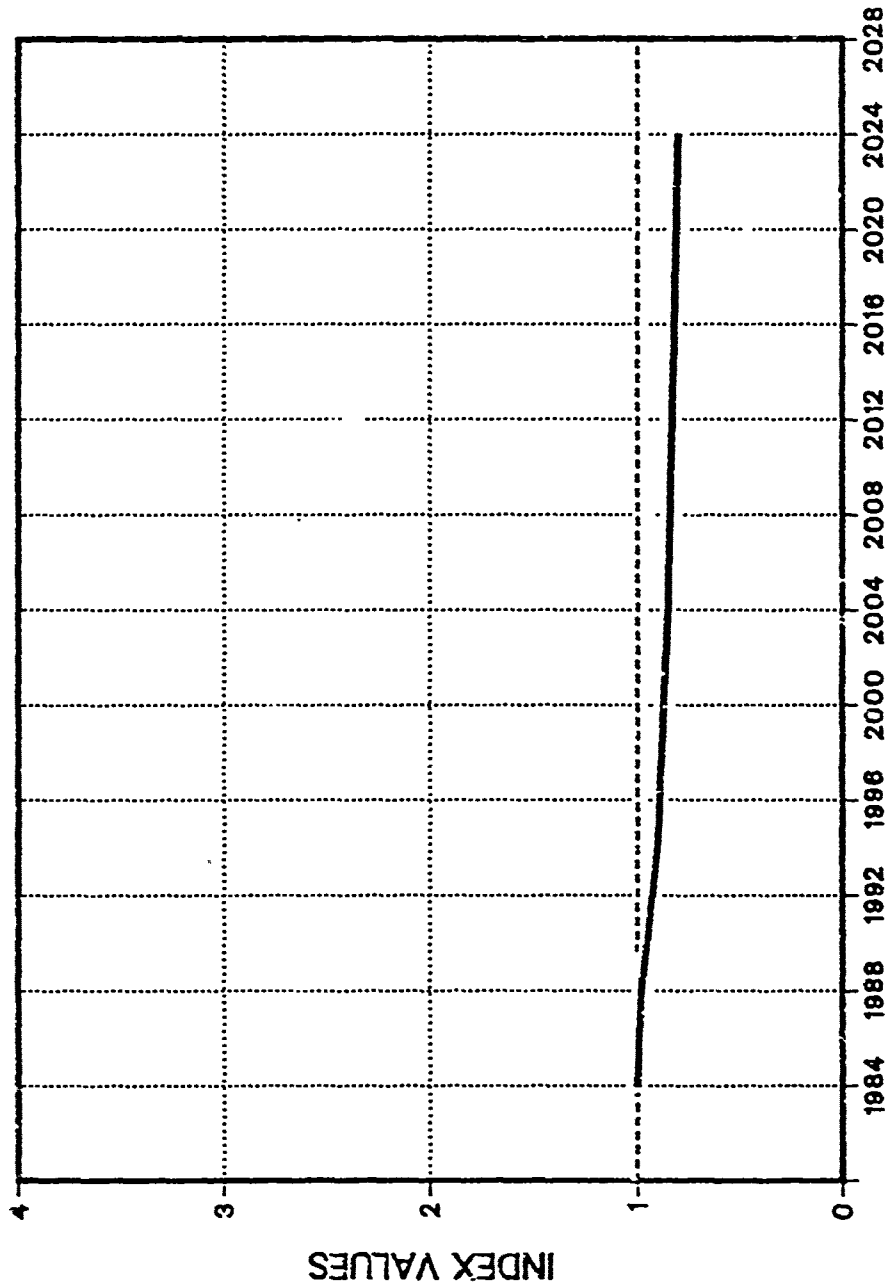
6.8 7.2 7.6 8.0 8.4 8.8

2020 2022 2024

9.2 9.6 10.0

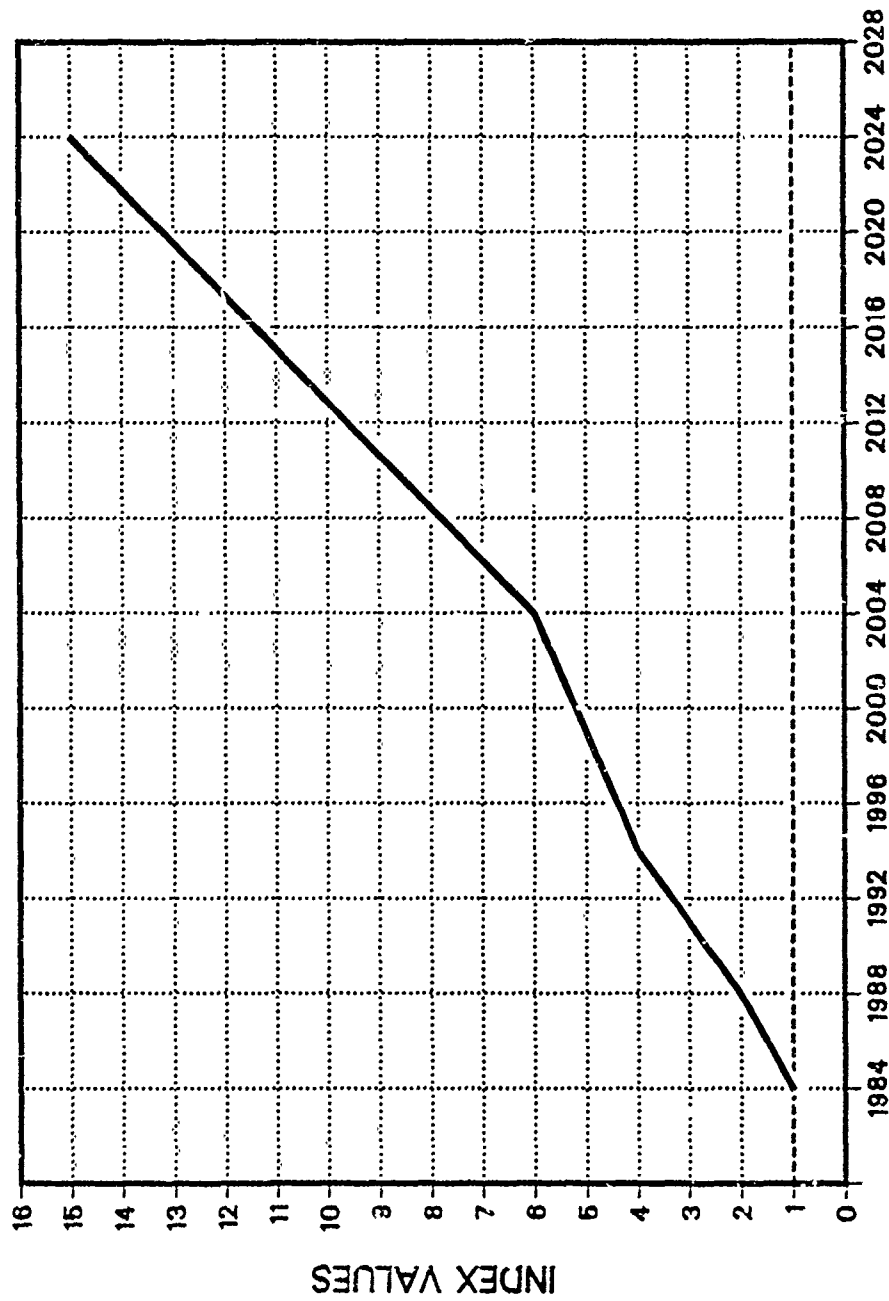
# TREND

## INDEX OF ARMY OFFICERS DEFICIENT IN BASIC SKILLS



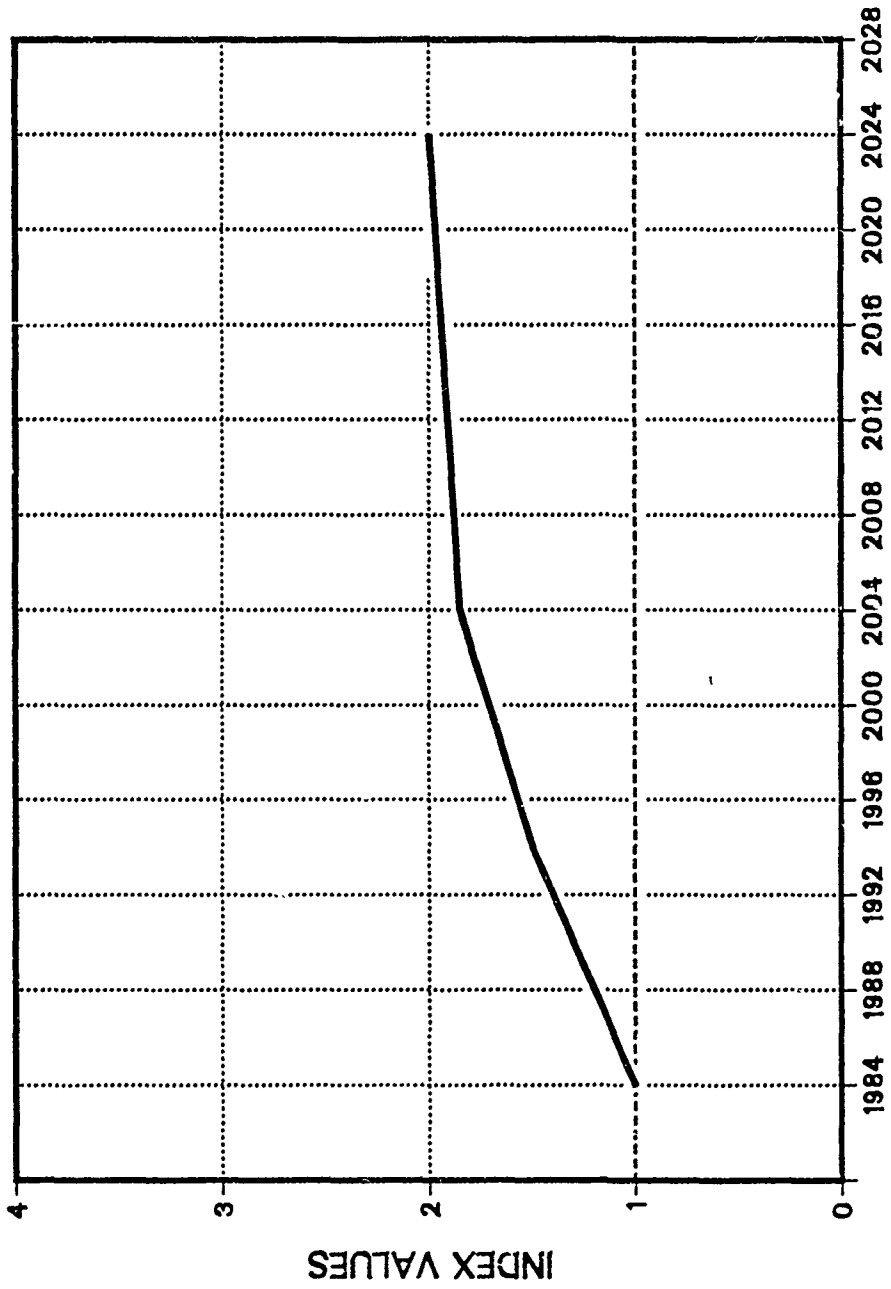
# TREND

## INDEX OF ARMY OFFICERS WHO ARE COMPUTER LITERATE

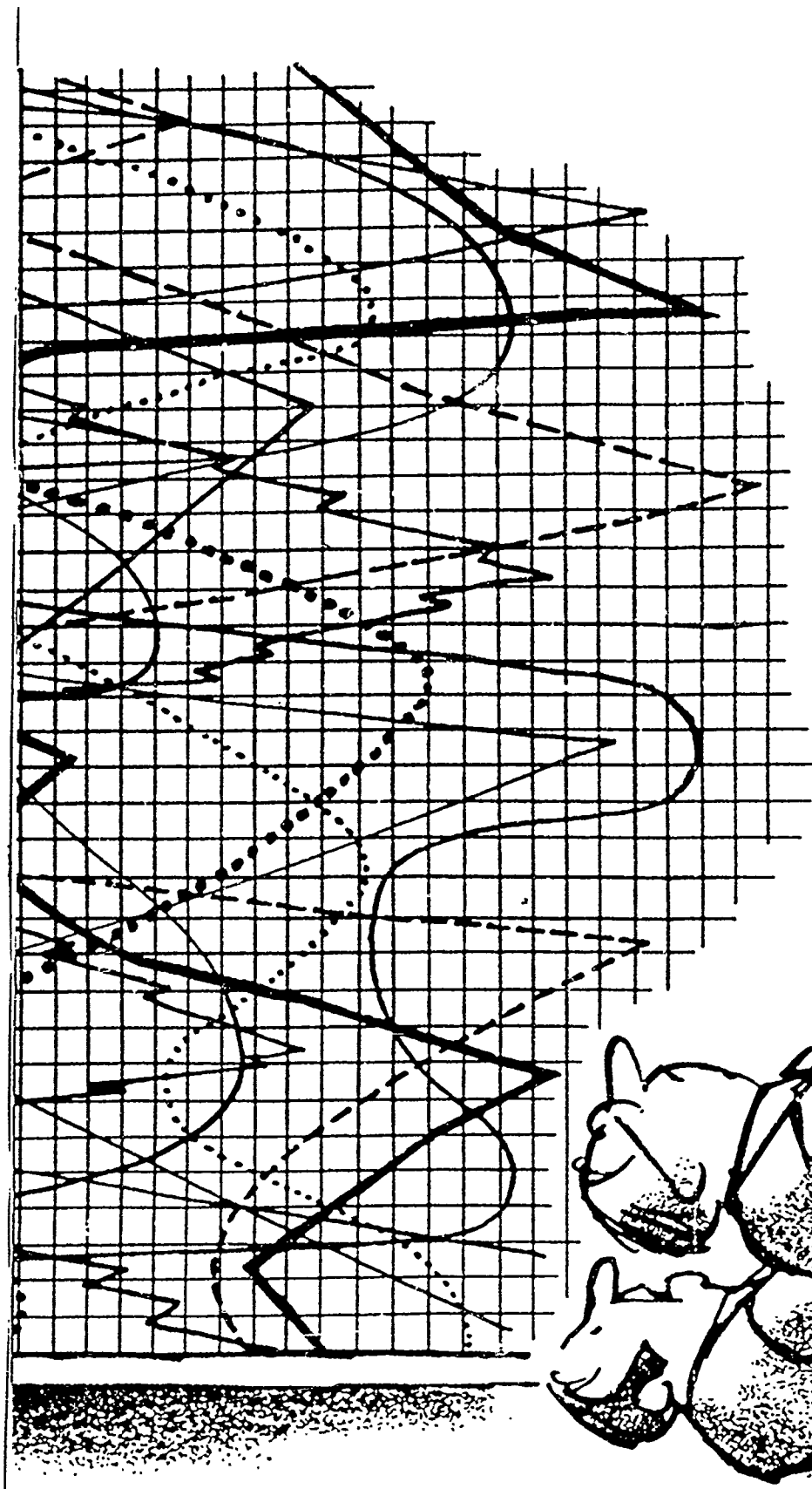


# TREND

## COST OF OFFICER TNG AND ED SYS IN CONSTANT DOLLARS



380



*H. J. G. S. S.*

*"Businesswise, it's been one hellava year."*

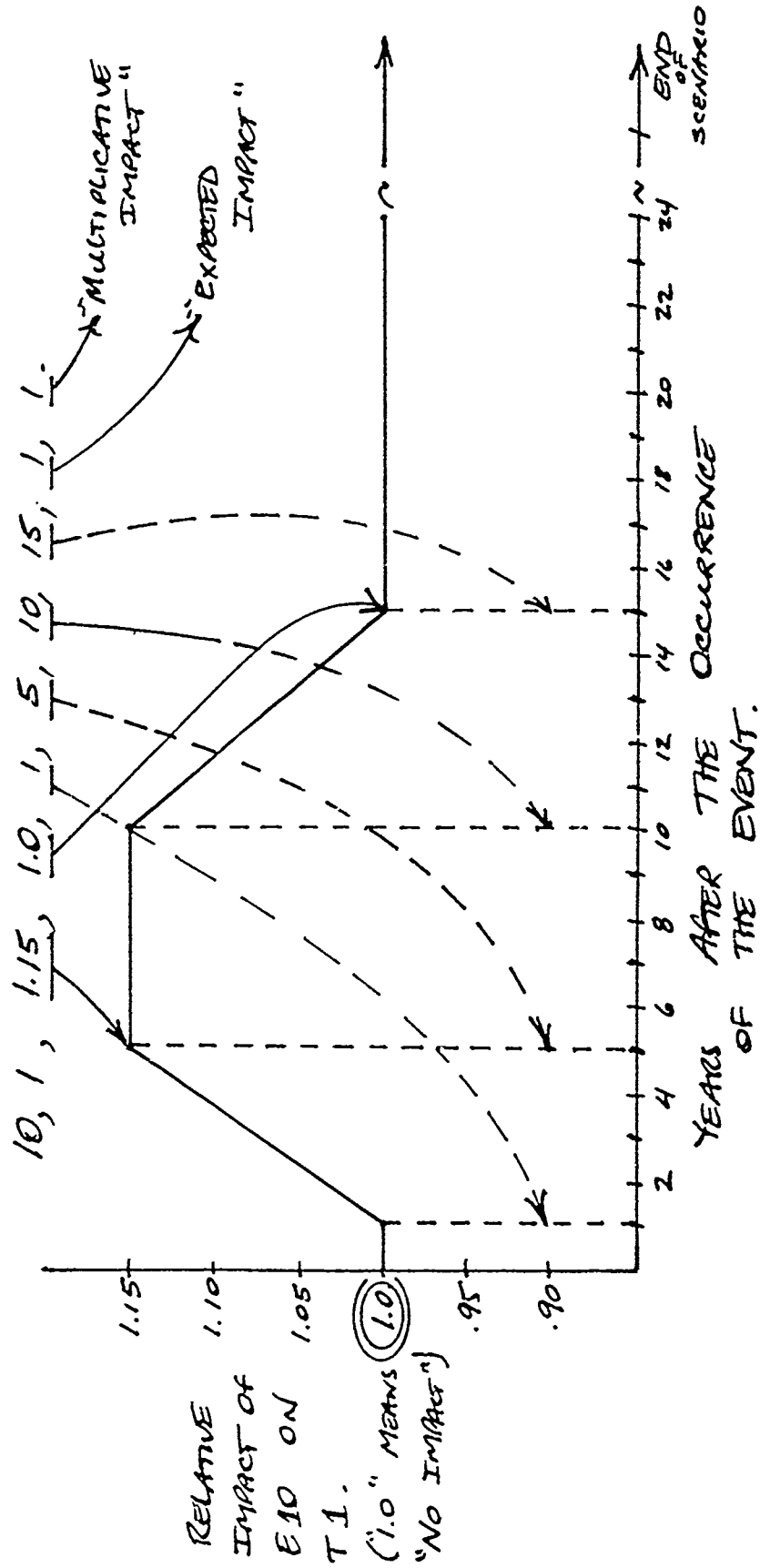


## FUTURES VARIABLES & INTERACTIONS

### Cross-Effects

- \* EVENTS ON EVENTS: INCREASE / DECREASE PROBABILITY OF OCCURRENCE OF IMPACTED EVENT.
- \* EVENTS ON TRENDS: INCREASE / DECREASE INDEX OF IMPACTED TREND.
- \* EXPECTED IMPACT versus BASELINE IMPACT.

THE CROSS-IMPACT OF EVENT 10 (RETIEMENT EXTENDED)  
ON TREND 1 (LOSS OF OFFICERS TO CIV).





NUMBER OF DECISION POINTS  
IN THE PDOS INTERAX MODEL

. 1300. .Nominal Trend Forecasts-  
- (65 Trends X 20 Indexes).

. 1580. .Nominal Event Probabilities-  
- (79 Events X 20 Probabilities).

. 6162. .Event-on-Event Hit/Miss Determinations-  
- (79 Events X 78 Events).

. 5135. .Event-on-Trend Hit/Miss Determinations-  
- (79 Events X 65 Trends).

. 2275. .Event-on-Event Cross-Impacts-  
- (325 Cross-Impacts X 7 Internal Decisions).

. 3816. .Event-on-Trend Cross-Impacts-  
- (477 Cross-Impacts X 8 Internal Decisions).

-----  
. 20268. .Total Decision Points.  
=====

The Computer Simulation Process

Developed Single Scenarios Against Which Desired System Could  
Be Created.  
Developed Multiple Scenarios Against Which Recommended Policies  
Could Be "Tested."

# COMPUTER SIMULATIONS

\* 9 SIMULATIONS = 25 ALTERNATIVE FIGURES / EACH  
TOTAL 225 SCENARIOS.

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\* 1 "STATISTICAL" RUN

\* 2 "WORLD - WITH - WARS"

\* 2 "DOMESTIC / INTERNAL CONTROL"

\* 2 "INTERNATIONAL / DOMESTIC  
TRANQUILITY"

\* 2 "FREE - PLAY"

ONCE WITHOUT

ONCE WITH

POOLS POLICY

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COMPUTER SIMULATIONS

ANALYSIS OF SIMULATIONS

**SYSTEM-WIDE ISSUE**

25 ALTERNATIVE SCENARIOS FOR EACH SIMULATION

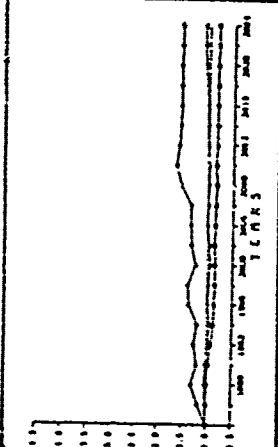
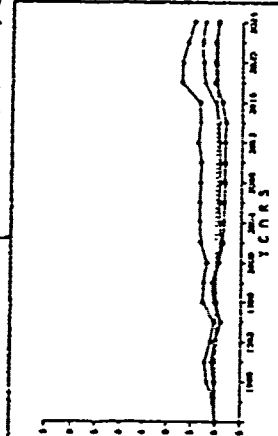
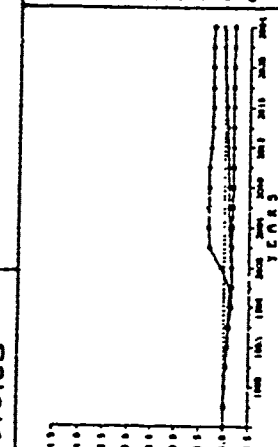
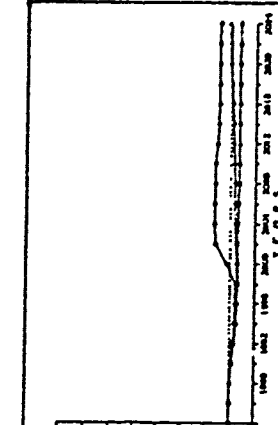
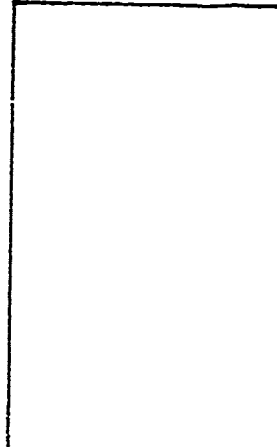
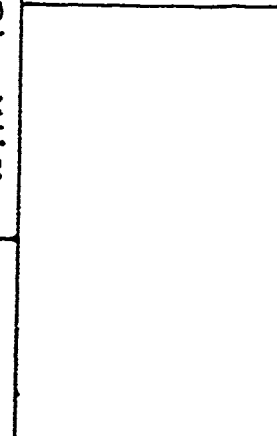
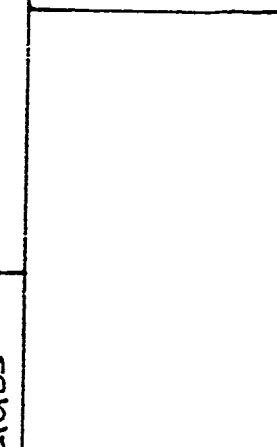
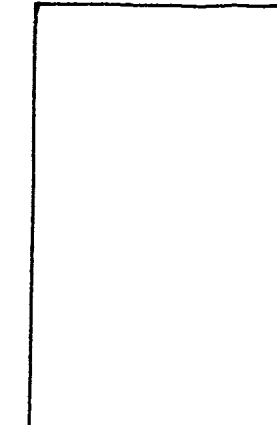
**BRIEF DESCRIPTION OF THE SYSTEM-WIDE ISSUE**

FREE PLAY	WORLD - WITH - WARS	INTERNAL CONTROL	TRANQUILITY
WITHOUT POLICIES			
<p>LINE OF MAXIMUMS</p> <p>LINE OF AVERAGES</p> <p>LINE OF MINIMUMS</p>			
	WITH POLICIES		

# ART AND SCIENCE OF WAR

--Level of officer adherence to the principles of art and science of war which includes:

- a. Theoretical knowledge and practical skills/proficiencies for each Transition Period.
- b. Knowledge of the human dimension of combat.
- c. An historical perspective of war.
- d. The ability to envision the future war.

FREE PLAY	World - With - Wars	INTERNAL CONTROL	TRANQUILITY
WITHOUT POLICIES			
			
WITH POLICIES			
			

## COMPUTER SIMULATIONS

1987

PODS POLICIES

70-ELECTRONIC WARGAMES---Army fields additional staff-oriented, electronic wargames for training. (2 OI)

81--COMMON CORE SKILLS ESTAB---Army establishes a "road map" of common core skills for each transition period. The package of common core skills, which is added to the MOS program, includes skills which lead to the mastery of the Art and Science of War. These skills are: 1) Theoretical knowledge and practical skills/proficiencies at each level of responsibility, 2) The knowledge of the human dimension of combat, 3) An historical perspective of war and 4) The ability to envision future war. (1 OI)

Continued

## Computer Simulations

1987

## PODS POLICIES

03--FORMALIZED PD PROG ESTAB---Army establishes a formalized officer professional development (PD) program at all TOE and TDA units and organizations. The execution of the program is decentralized to the units and organizations but includes as a minimum professional development in the following:

- a. Professional Values.
- b. Warrior Spirit.
- c. Leader-Mentor Roles/Relationships.
- d. Self-Development.
- e. Art and Science of War.
- f. Common Shared Operational Language.
- g. Expert--Integrator Roles/Relationships.
- h. Decision Making and Conceptual Skills.

(1 (01)

05--WARRIOR SPIRIT PROG EST---Army establishes a program to instill the warrior spirit throughout the entire Army which includes:

- a. Officer knowledge of the "threat."
- b. More physically and stressfully demanding training.
- c. Annual qualification with a basic weapon (results recorded on the OER).
- d. Officer knowledge of "practical terrain sense."
- e. Officer knowledge of basic tactical doctrine and employment of common individual and crew-served weapons.

(1 01)



## Computer Simulations

1988

PDOS POLICIES

04-REQD SCHOOL EXPERIENCE--Army establishes policy requiring officers to complete schooling as follows: All lieutenants to attend resident ORC prior to first assignment, all captains to attend resident OAC and resident CAS3 (basic assumption: this policy will add approximately 450 man-years--18% increase--to the CRT. This account in any given year), all majors to attend a CSC (no appreciable increase in TMS account is anticipated as completion of CSC-level schooling may be accomplished by correspondence) and all colonels to attend an SSC (no appreciable increase in TMS account is anticipated as completion of SSC-level schooling may be accomplished by correspondence). (1 OI)

1989

PDOS POLICIES

33-ARMY ESTAB ENTR REQS--Army establishes minimum entrance requirements for officers such that cadets and candidates must achieve a pre-established standard score on a battery of tests prior to commissioning. (2 OI)

40-SELF-ASSESSMENT TESTING--Army establishes a policy which includes self-assessment testing as part of resident education from captain through general officer. (1 OI)

51-COMPETENCY TESTS ESTAB--Competency tests are established as a prerequisite for schooling at the next Transition Phase through Transition Phase 3. (2 OI)

## Computer Simulations

1990 PDOS Policies

45- MIL QUAL STANDARDS TEST--Army officers (WO1 to O6) are required to take some form of periodic military qualification standards tests to validate their knowledge of one or a combination of the following: Branch, Functional Area, Area of Concentration and/or Skill. TRADOC has developed and distributed to all officers (O1 to O5) Military Qualification Standards (MQS) materials. (1 OI)

46- ARMY INSTALLS CBI--Army installs an extensive computer based instruction (CBI) system using, e.g., MicroTICIT. A major portion of Army resident and non-resident officer instruction is conducted by CBI which includes the interactive imparting of knowledge and information for the student by computer assisted instruction (CAI) and the management of the adminy assisted training and education for the staff and faculty by computer managed instruction (CMI). (This is the PDOS-recommended policy concerning "education and training methodologies.") (2 OI)

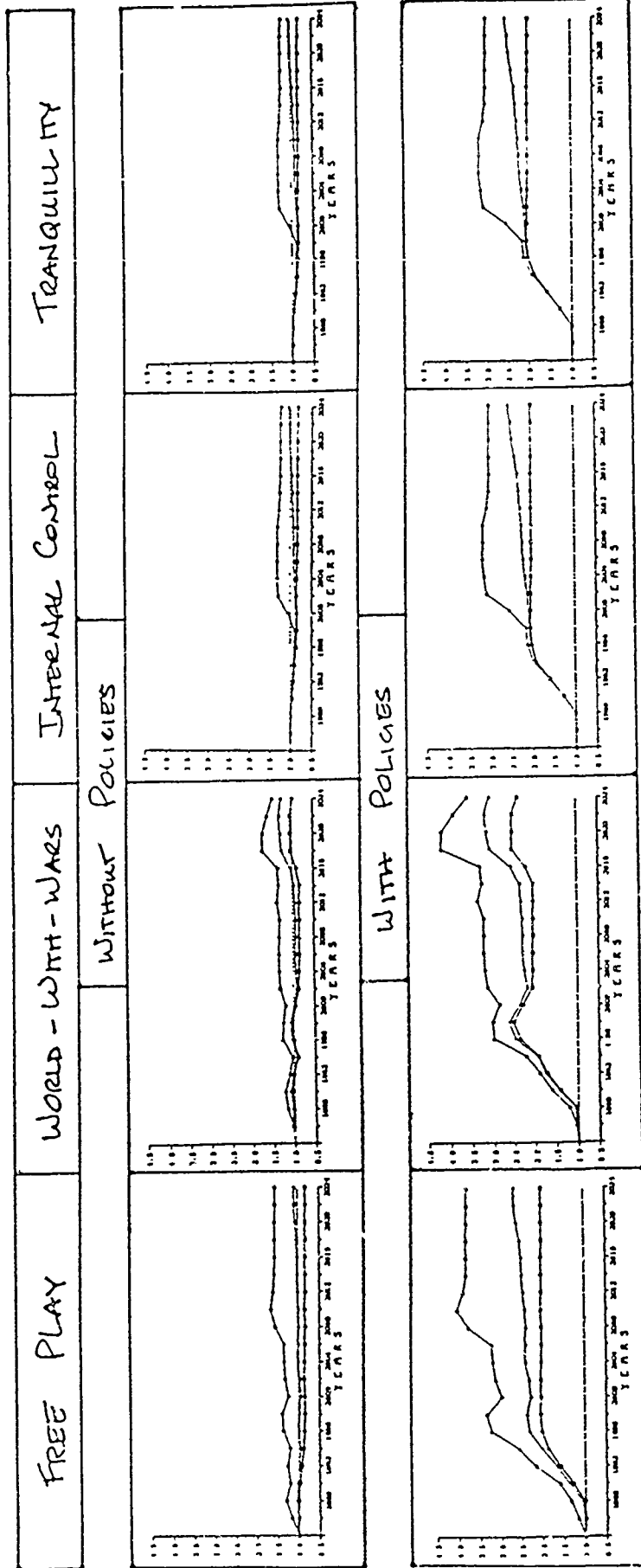
47- ARMY ESTAB ASSMT CNTRS--Army establishes assessment centers in conjunction with resident schools or installation-level learning centers designed to assess level of individual officers (O1s through O6s) as to their professional development. The assessment centers evaluate officer: potential, knowledge, personality traits and attitudes, interests, aptitudes (e.g., integrative skills) motivation and stress adaptation, physical fitness and skills. (1 OI)

1991 PDOS Policies

# ART AND SCIENCE OF WAR

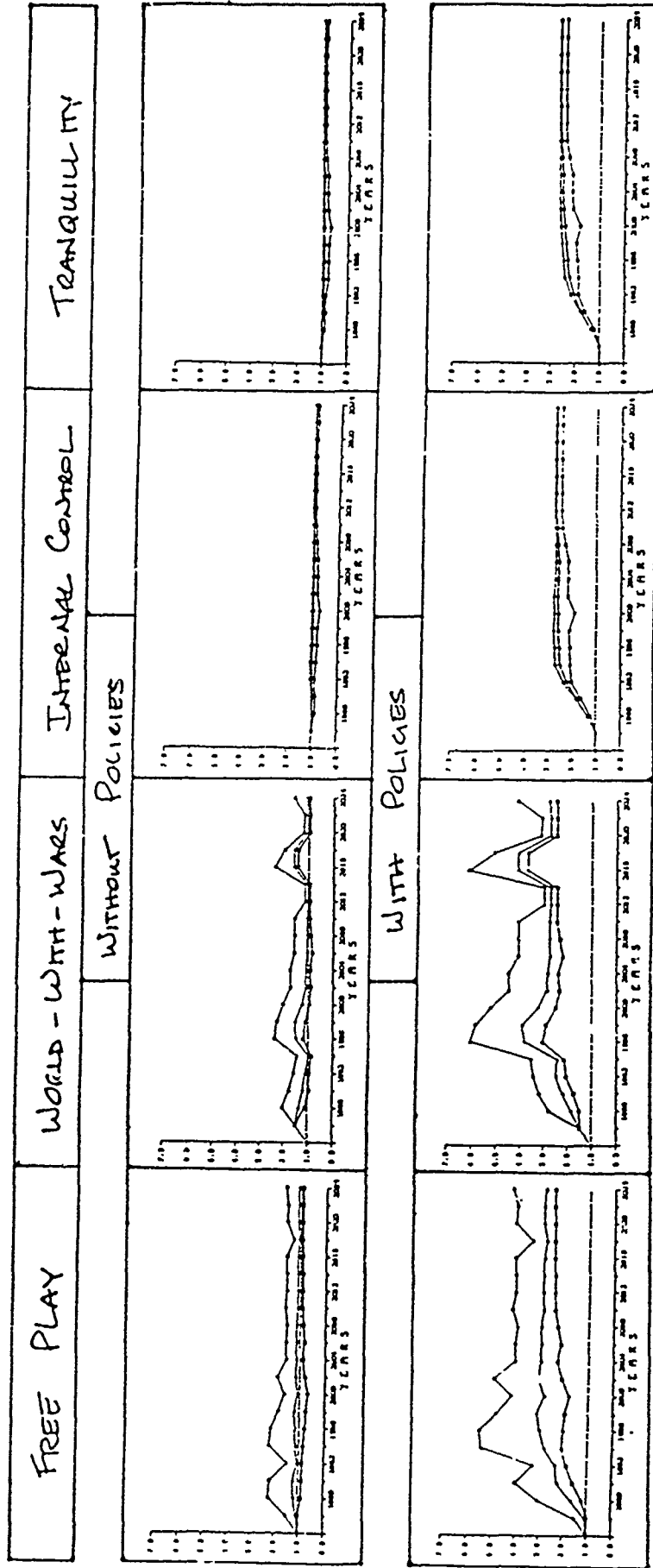
--Level of officer adherence to the principles of art and science of war which includes:

- a. Theoretical knowledge and practical skills/proficiencies for each Transition Period.
- b. Knowledge of the human dimension of war.
- c. An historical perspective of war.
- d. The ability to envision the future war.



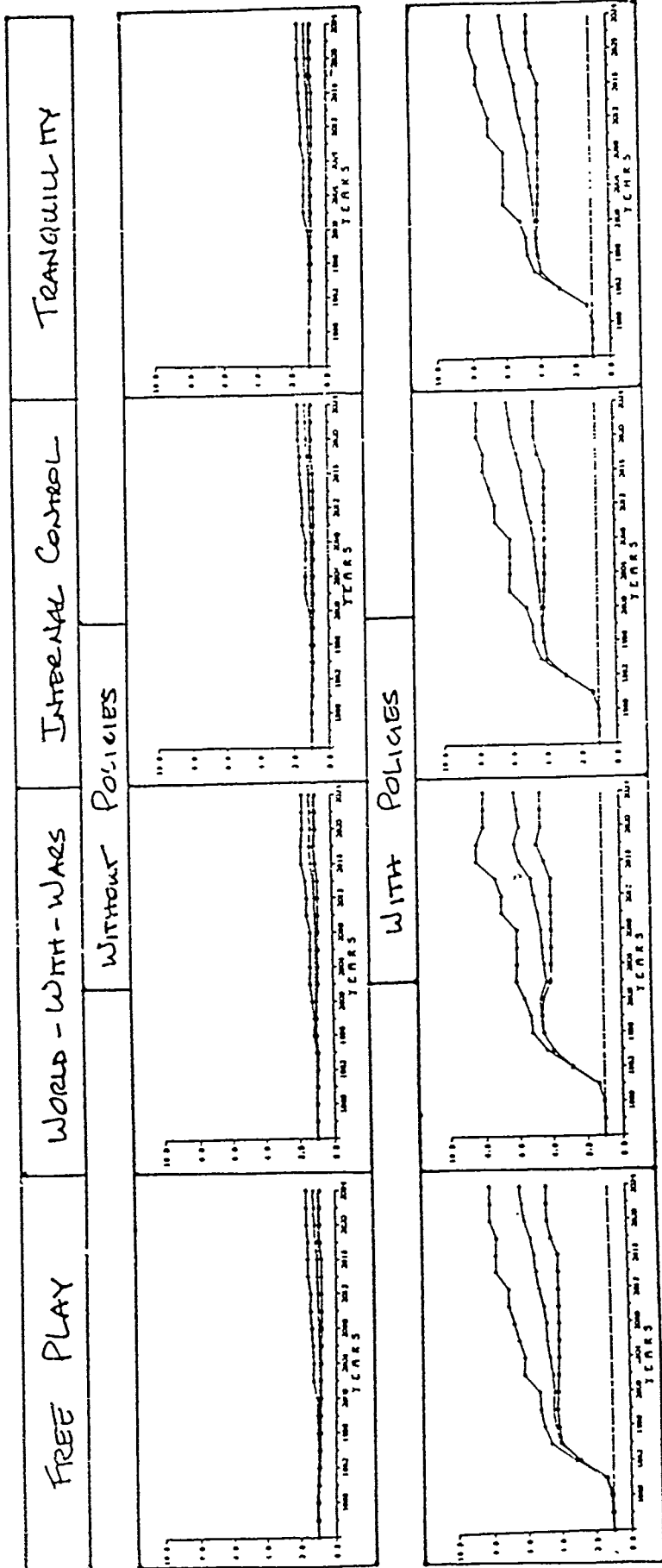
# WARRIOR SPIRIT

--Level of officer adherence to the state-of-mind and preparedness that blends all the physical, mental and moral qualities essential for an officer to successfully lead the Army in its mission of protecting the Nation. Officers accept the responsibility of being entrusted with the protection of the Nation; are prepared physically and mentally to lead units to fight and support in combat; are skilled in the use of weapons, organizations and tactics; inspire confidence and an eagerness to be part of a team; has the ability to analyze and the boldness to take action to accomplish the mission.



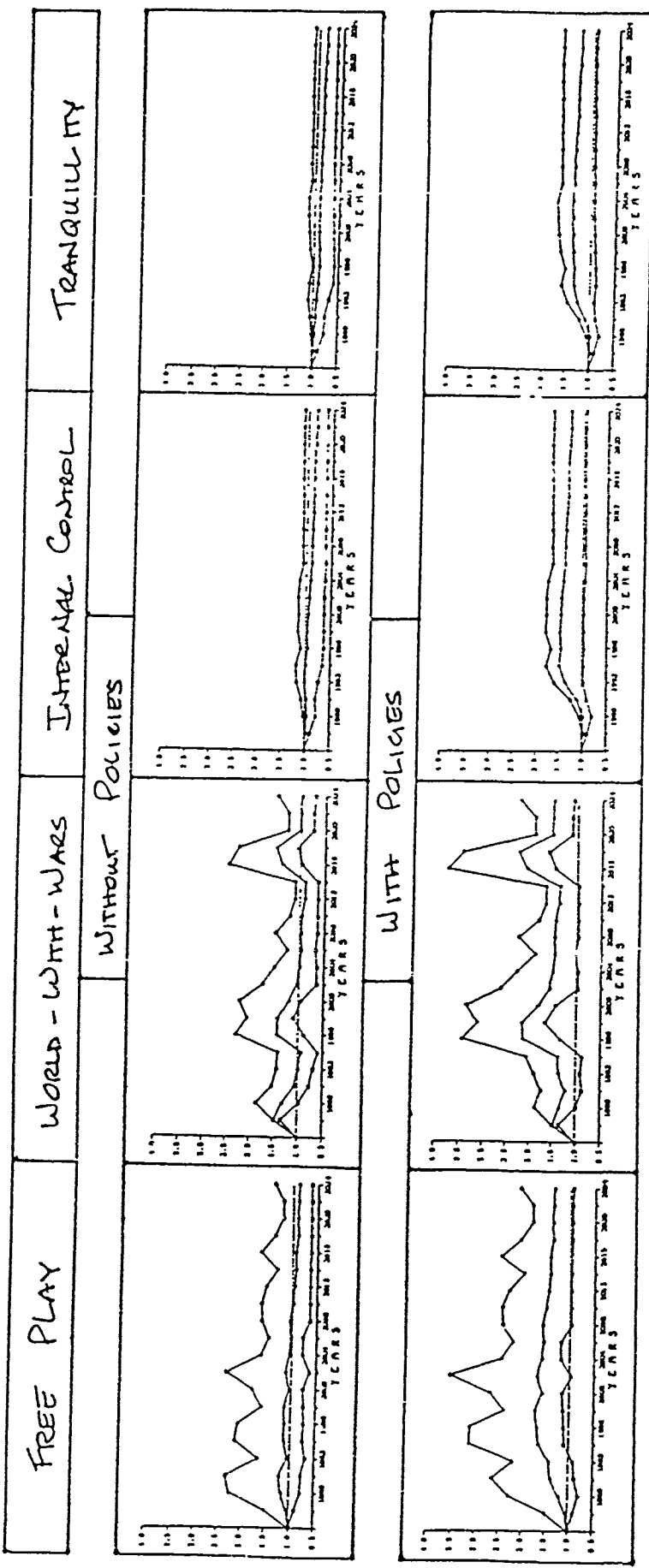
# SELF - DEVELOPMENT

--Level of officer acceptance of primary responsibility to progressively grow and learn, both the profession of arms and his/her functional specialty(ies).



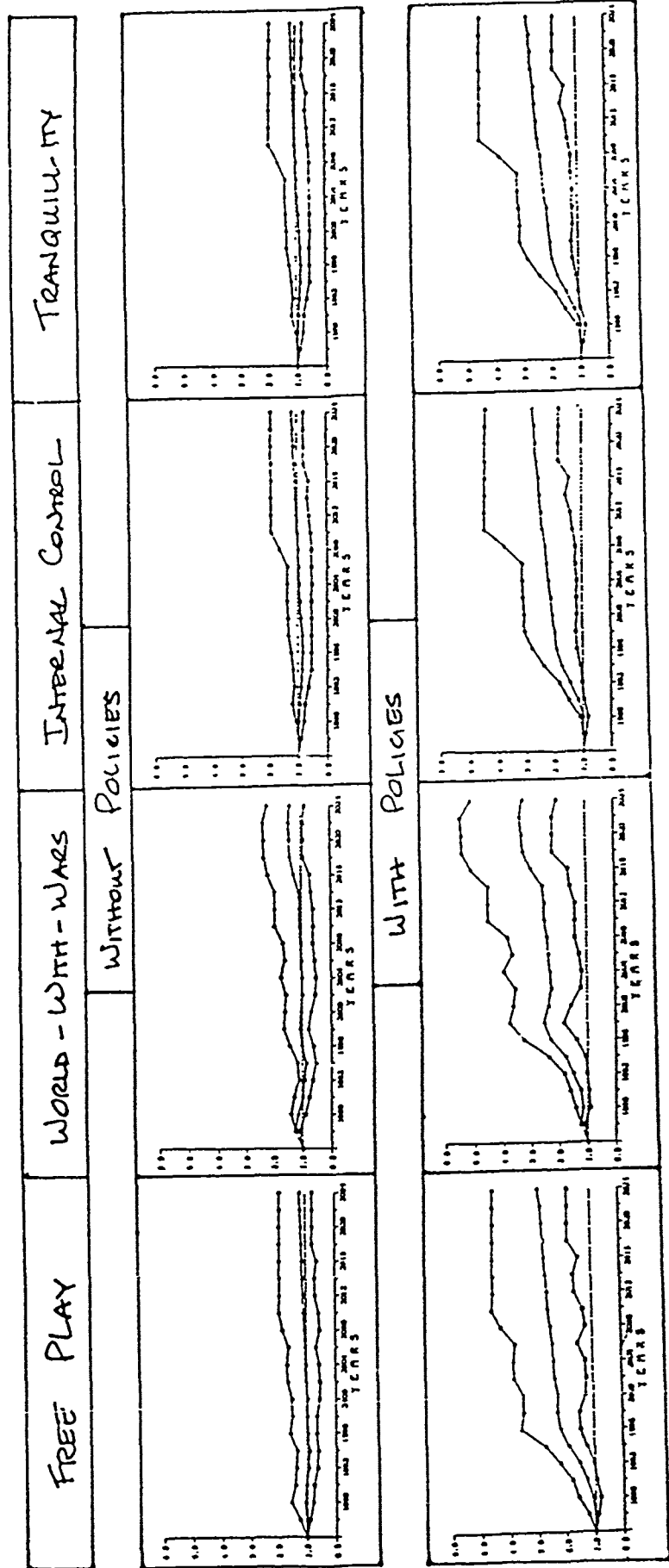
**LEADER - MENTOR**

--Level of officer adherence to a style of leadership which facilitates the growth and development of subordinates by educating, socializing and training subordinates and by being for those subordinates a role model, a teacher, a coach, an advisor and a guide.



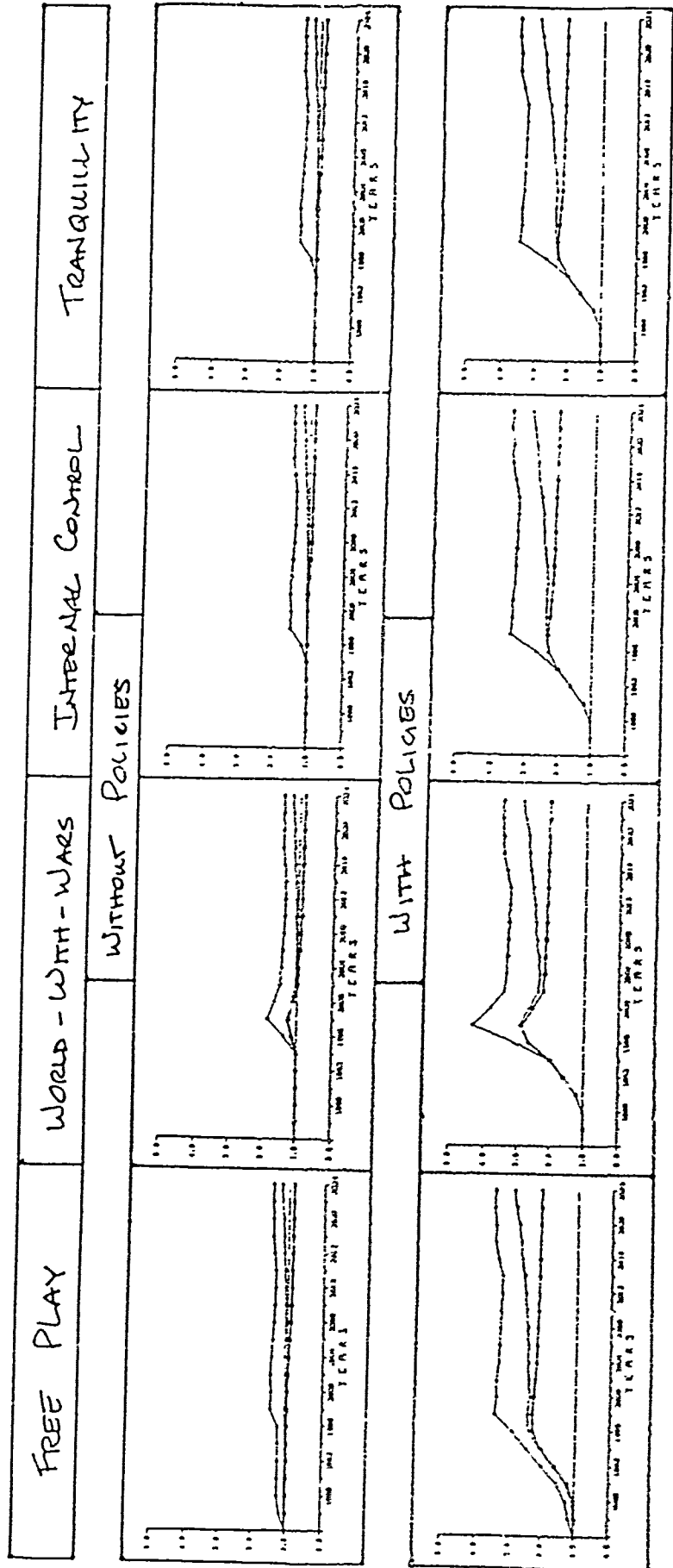
# Expert - Integrator

--Expert--Level of officer in-depth knowledge and capabilities in a single branch, functional area and/or area of concentration the major contribution of which is within a specifically defined area. Integrator--Level of officer knowledge and capabilities in one or more branches, functional areas and/or areas of concentration and ability to analyze, synthesize, conceptualize and/or use decision making skills to achieve synergistic results affecting multiple areas.



# DECISION MAKING SKILLS

--Level of officer ability to use analytical and conceptual skills necessary to establish goals and objectives, identify problems, develop alternatives, evaluate alternatives, choose an alternative, implement, control and evaluate decisions.





## POLICY INSIGHTS

RECAP

### POLICIES IMPACTING ON:

□ "ASW" = Powerful; Long-Lasting.

□ "CSOL" = Policies are closely associated with "ASW" —  
— Powerful; Long-Lasting.

□ "WS" = Consistent Through Time; Long-Lasting.

□ "LM" = Consistent Through Time; Long-Lasting.

□ "E-I" = At 1<sup>st</sup>, Powerful; Becomes Ineffective By 2009.

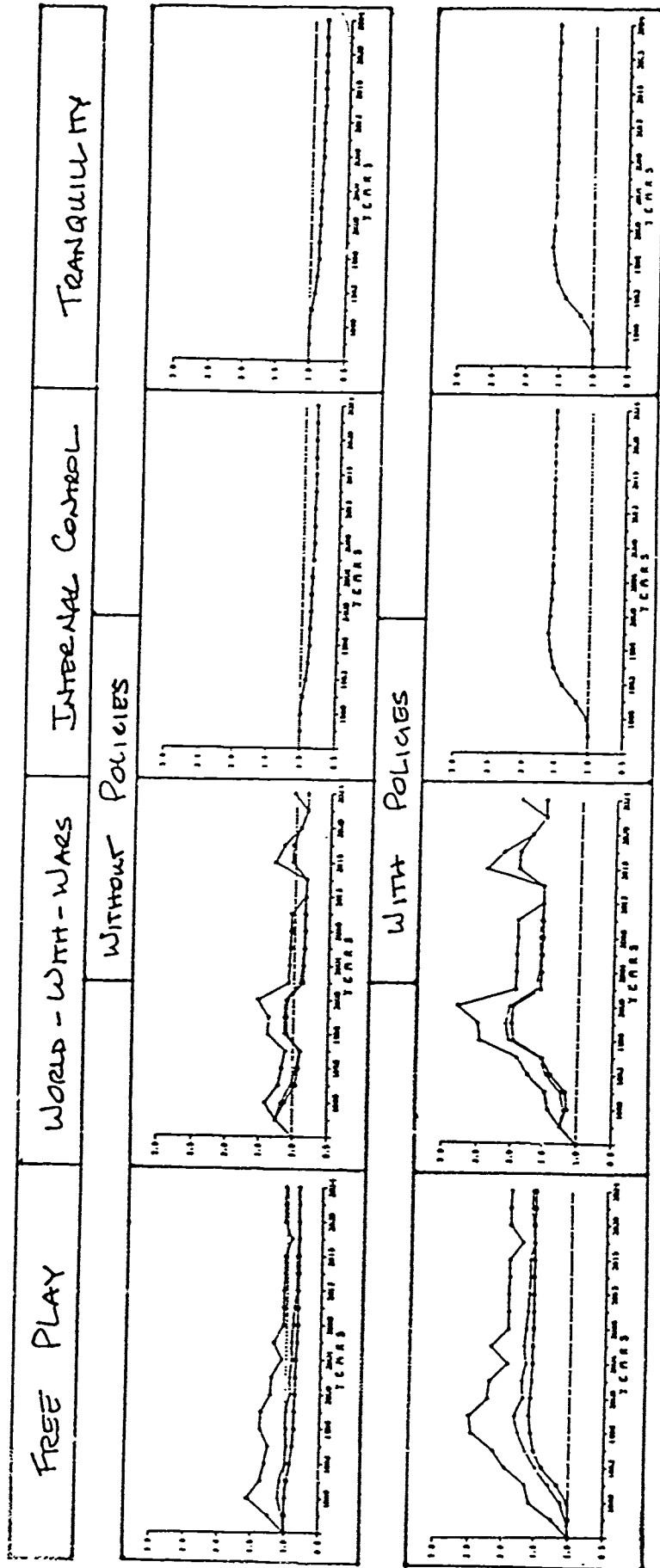
□ "SD" = Powerful; Lasts A Short Time.

□ "DMS" = Policies are closely associated with "SD" —  
— Powerful; Lasts A Short Time.

□ "PV" = Powerful; Long-Lasting.

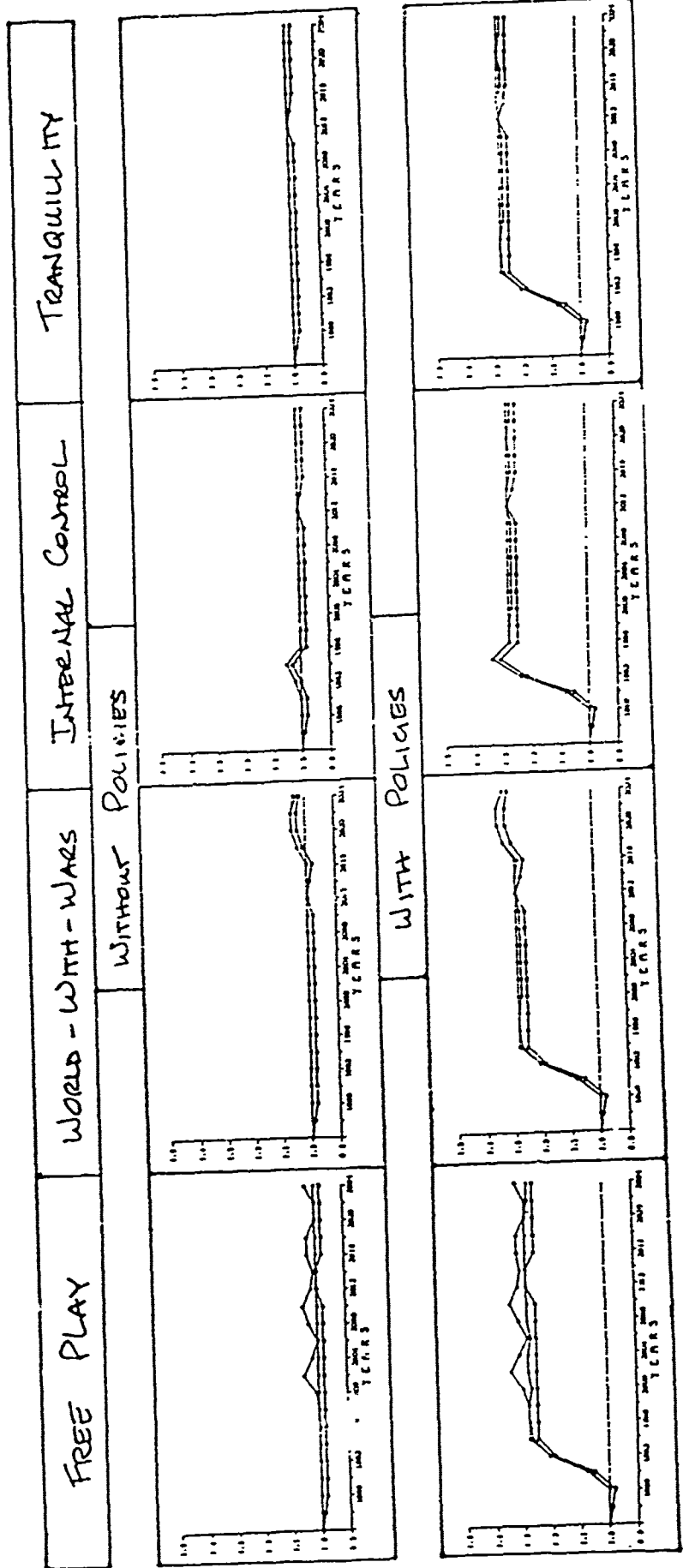
# COMMON SHARED OPERATIONAL LANGUAGE

--Level of officer proficiency in the skills associated with using a common military operational language.



# PROFESSIONAL VALUES

--Level of officer adherence affectively and behaviorally to the complex set of professional values described in the "PDOS System-Wide Transition Period" literature: briefly-- officers accept the responsibility for protecting the Nation; they internalize and display the values of integrity, selflessness, honesty, special trust, loyalty, care for soldiers and their families, excellence in performance of all duties; they establish a command climate which produces initiative, trust and mentorship.



Policy Recommendations

- Once Policies Are Installed, Need To Keep Monitoring Them--  
-Intensive Decentralized And "Self" Management Are Built Into  
The Model.
- MDS Testing and CCBH Policies Seem Most Powerful--Should  
Execute These Initiatives.
- Assessment Strategy Is Next Most Powerful--Should Continue  
Initiatives Associated With This Strategy.

## METHODOLOGY INSIGHTS

Positive

- \* AN AID TO ORGANIZING THINKING
  - EVENTS
  - TRENDS
  - CROSS IMPACTS
- SUBJECTIVE
- OBJECTIVE
- DATA

\* PROVIDES A MOUNTAIN OF DATA

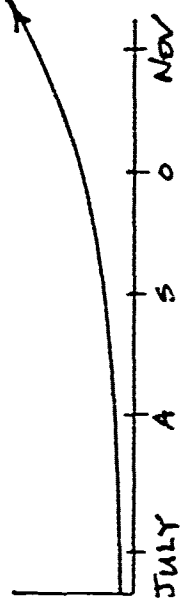
\* HELPS DECISION MAKER TO :

- MANAGE "KNOWABLE" UNCERTAINTY.
- PROVIDE CONSISTENCY TO DECISIONS.
- OVERCOME HUMAN INABILITY TO HOLD > 7 ± 2  
PIECES OF DATA IN SHORT-TERM MEMORY.

METHODOLOGY INSIGHTS

NEGATIVE

- \* CUMBERSOME  $\equiv$  NOT RAPIDLY RESPONSIVE
- \* LABOR INTENSIVE
- \* SLOW LEARNING CURVE FROM "SCRATCH"



## METHODOLOGY RECOMMENDATIONS

- \* INTERVIEW AESTAF PRINCIPALS : INCLUDE THEIR EVENTS, TRENDS & CROSS-IMPACTS.
- \* RE-DO "DELPHI" OF EVENTS & TRENDS.
- \* MODIFY SOFTWARE  $\equiv$  NEED MORE "INFORMATION" FROM THE DATA.
- \* GET KEY DECISION MAKERS INVOLVED IN INPUT & OUTPUT.
- \* FIND A HOME FOR THE PROCESS.

## Appendix 10 to Annex II

### Glossary

**PURPOSE.** To define terms which are new, unique or critical to this study.

#### 2. GLOSSARY.

a. **ALTERNATIVE FUTURE:** A computer generated scenario which includes a list of randomly selected events along with their year of occurrence, and a list of all trend values as modified by the cross-impacts of the randomly selected events or as modified by the "non-occurrence" of events which are expected to occur.

b. **CROSS-IMPACT:** A decision that an event, were it to occur in a computer simulation, will cause a change in the probability of the occurrence of another event or a change in the forecast of the trend level for a trend. The analyst makes pair-wise comparisons of each event on all other events and on all trends to determine if the first event in the pair-wise comparison would cause some sort of change in the second event or trend in the comparison. The cross-impact of an event-on-another-event has the effect of increasing or decreasing the probability of the occurrence of the impacted event should the impacting event actually occur in a computer simulation. The cross-impact of an event-on-a-trend has the effect of increasing or decreasing the level of the trend line should the impacting event actually occur in a computer simulation. The cross-impact data are entered into the INTERAX computer model along with event probabilities and trend levels.

c. **CUMULATIVE PROBABILITY:** The increasing probability that an event will occur prior to a given year—as opposed to an "interval probability" which is the probability that an event will occur during a specific year.

d. **DELPHI:** A technique used to obtain collective opinion among a group of experts by attempting to prevent forceful group members from dominating the discussion and stifling the contributions of other group members. A decision maker sends a questionnaire or set of issues

to experts; they respond; return their responses which are consolidated at a central location; and are returned as an aggregate of responses to the experts for a second round of responses. This process continues until the decision maker who is asking the questions is satisfied with the responses. The DELPHI technique employed by the PDOS Futures Team involved two rounds: A "questionnaire" round (see Appendix 3, this Annex for a copy of the DELPHI questionnaire) and a "conference" round at which respondents were offered the opportunity to change their original responses after there was group discussion on those questions for which there was large disagreement.

e. **EVENT:** A statement that something occurs at a specific point in time (as opposed to a "trend" which is a statement that something has specific direction or movement). In the INTERAX process, an event has a set of cumulative probabilities of occurrence throughout the length of the model. In the PDOS INTERAX model, there are 20 cumulative probability estimates for each year from 1984 through 2025 for each event.

f. **FUTURES RESEARCH:** A discipline concerned with the study of alternative futures. It treats long-term forecasting as an open-ended analytic problem and seeks to better understand the issues, the stakeholders and the uncertainty of the future from both controllable and uncontrollable forces. Some key features of the futures research approach are:

- (1) It is a learning process.
- (2) It explicitly includes uncertainty.
- (3) It always includes time as an explicit variable.
- (4) It seeks "robust" solutions (ones which remain favorable over prolonged periods and under a wide variety of scenarios).



(5) It is always part of a continuing process.

g. **INSIGHT:** An instance of clearly seeing and understanding the nature of things— normally, a by-product of education. Answers the question, "What does this mean?"

h. **INTERAX:** The acronym for the futures research process developed by Selwyn Enzer, PhD, Associate Director, Center for Futures Research, University of Southern California. The acronym stands for "Interactive Analysis for Strategic Planning." INTERAX includes three parts:

(1) A "system model" defined by the universe of events and trends and their nominal data.

(2) A "cross-impact model" defined by the cross-impacts of events-on-events and events-on-trends.

(3) A "policy analysis" component which are the actions taken by the decision maker (or analyst) to make adjustments in response to the "flow" of events and trends in a computer simulation.

i. **INTERAX PROCESS.** A term used throughout this document to describe the collective use of the components of INTERAX.

j. **MONTE CARLO:** A technique for randomly selecting whether an event occurs or does not occur in a trial run of a computer simulation. In the computer program of the INTERAX, this process occurs to determine which set of events are picked in order to create an alternative futures scenario.

k. **MULTIPLE (COMPOSITE) SCENARIOS:** A set of scenarios run during a single computer simulation generated from a single random number. The PDOS Futures Team ran nine sets of multiple (composite) scenarios each of which contained 25 scenarios. The resulting graphs of the trend lines show three lines for each trend: an outline of the upper-limit which a single scenario (of the 25 scenarios) could have taken, an outline of the lower-limit and an outline of the average.

l. **NOMINAL DATA.** The cumulative probabilities for events and forecast of trend levels for trends generated by the "experts" and placed in the INTERAX model. The nominal data is referred to as the "system model" in the INTERAX (see the definition for INTERAX, above).

m. **PERFORMANCE MEASURES:** Trends in an INTERAX model which are considered as measures of the performance of the decision maker's system/organization/future.

n. **POLICY:** A set of events in the PDOS INTERAX model which reflect the specific implementation of PDOS-recommended policies.

o. **POLICY IMPACT ANALYSIS:** A systematic way to examine possible future impacts of policies and their interactions.

p. **RANDOM:** Color designating an event having a relative frequency of occurrence that approaches a stable limit as the number of observations of the event increases to infinity. A random number generator is used by the INTERAX computer program to determine if an event has occurred during a given time period. If the random number is equal to or greater than the probability of the event, the event is deemed to have occurred.

q. **SCENARIOS:** Alternate futures generated by the INTERAX computer model.

r. **SIMULATION:** An INTERAX computer run which generates either single or multiple scenarios (alternate futures).

s. **SINGLE SCENARIO:** A single alternate future generated by the INTERAX computer model which lists events and the year in which they occurred plus a list of trends as modified by the occurrence or nonoccurrence of events during the simulation. The scenario may also contain a narrative of the simulation as interpreted by an analyst (see Appendix 7 for an example).

t. **SUPPRESS:** To prevent an event from occurring during an INTERAX simulation.

u. **SYSTEM-WIDE ISSUES:** The name given by the PDOS Study Group to a concept (e.g., "warrior spirit," "art and science of war") that was not peculiar to a particular Development Period (e.g., Development Period—Captain). The analysis of these issues provided the threads to weave the fabric that ties the desired Officer Professional Development System together. A specific system-wide issue was treated as a trend (specifically, a performance measure) in the INTERAX model. The nominal trend value was given as "1.00" from 1984 through 2025 by Futures Team analysts and was cross-impacted by selected events.

v. **TREND:** A statement that something has specific direction and movement (as opposed to an "event" which is a statement that something occurs at a specific point in time). In the IN-

TERAX process, a trend has a set of forecasted levels which indicate a shift from an assumed value for 1984 (in the PDOS INTERAX model). The values can be numbers from real data (e.g., population figures); they can be a "multiplier" which can be used later when real data can be found (e.g., "1.00" for 1984 and shifts from 1.00 throughout the rest of the years in the model); or they can be set as an "index" of 1.00 throughout

the entire model and then cross-impacted by selected events to show shifts as a result of those event occurrences or non-occurrences (e.g., Army Esprit de Corps is a trend in the PDOS INTERAX model which has a nominal forecast of 1.00 throughout the model; it is, however, cross-impacted by selected events and would appear as shifted in a given scenario).

## Appendix 11 to Annex II

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