OFFICE OF THE DIRECTOR
NATIONAL FOREIGN ASSESSMENT CENTER

ACTION

8 June 1981

NOTE FOR: D/NFAC

THRU : C/PMES

25X1

[redacted]:

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This is the 83 Enhancement package. It will be followed later this week by the progress reports on prior year enhancements.

Note Tab I of Attachment A. It is the writeup on your "Systems Dynamics" idea. [redacted]/OPA prepared the text, although he is not optimistic about successful use of such techniques on NFAC problems.

25X1

[redacted]

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NATIONAL FOREIGN ASSESSMENT CENTER

WASHINGTON, D. C. 20505

Director

10 JUN 1981

MEMORANDUM FOR: Comptroller

SUBJECT : Transmittal of FY-83 Production Enhancement Proposals

REFERENCE : Your memo, dated 17 April 1981, same subject.
Compt 81-0504

1. This memorandum forwards NFAC's FY-83 Production Enhancement Proposals (Attachment A). As requested in the reference, they are in priority order according to their potential value to NFAC.

2. In addition, we have reviewed proposals prepared by ORD. Their titles are listed as Attachment B, and they also are prioritized according to their potential value to CIA's production process.

3. Attachment C provides our rankings of the ORD proposals when they are combined with ours. The fact that most of ORD's have been ranked below our own should not be interpreted to mean they are without merit. Rather, it indicates our view of their relative potential value. If other components have submitted FY-83 proposals, we request an opportunity for review and ranking against our own.

4. Should you require further information, please contact [redacted] of PMES. 25X1

5. All portions of this memorandum are classified **SECRET**.

[redacted] 25X1

John McMahon

Attachment:
As stated

COMPT RECORD COPY

[redacted] 25X1

A

SECRET

Attachment A

5 June 1981

NFAC FY-83
Production Enhancement Proposals

REVISED

($000)

	Tab			FY-83	FY-84	FY-85
Y	A	PMES	Computer for Experimentation with Large Computation Intensiv Applications			
Y	B	OPA	Exploiting Political and Social Data			
	C	OGSR	Nonfuel Mineral Supply-Demand Data Base			
	D	OER	Computer Technology Research			
DROPPED	E	OSWR	Weapons Intelligence Analysis Center			
Y	F	OSR/ OSWR	Center for the Study of Soviet Naval Tactical Warfare			
Y	G	OGSR	Spatial Data Analysis Project			
Y	H	OER	Industrial Analysis Forum			
	I	PMES	Systems Modeling Center			
			TOTALS			

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A

1 June 1981

I. Project Title: Computer for Experimentation with Large Computation Intensive Applications

Submitting Agency: CIA

II. Costs:

25X1

III. Description of Project:

A. Statement of Need:

Several NFAC offices have requirements for experimentation with large computation intensive computer applications. Large computer models such as OGSR's CHALLENGE, some of OER's econometric models and some of OSWR's and OSR's systems/models require large amounts of mainframe computer processing time (some require hours). Consequently, the number of computer runs is limited to at most a few per work day and, in some cases, is limited to a single overnight run. Such delays reduce the overall amount of experimentation and exploitation that can be done with these models. They also constrain the ability to develop and subsequently run in a production mode. A solution to this problem, and for many computation intensive applications of this type, is a high speed digital processor with parallel processing of heterogeneous data. Such processors have been under development for several years and are just now beginning to enter the commercial marketplace. They have execution speeds of 10 to 160 million instructions per second, which compares to about five million instructions per second for ODP's largest IBM mainframe. Such speeds would reduce processing time by factors of up to 30 and be able to execute different instructions on multiple data streams simultaneously. This represents a significant advance in computer architecture. (U)

B. Who Will Accomplish?

ODP will install and operate the parallel processor. NFAC requirements for the processor will be coordinated through the NFAC ADP Control Officer. (U)

C. What is to be Installed?

A high speed digital processor with parallel processing of heterogeneous data elements is to be installed for experimentation with large computation intensive applications. (U)

D. Payoff

The payoff of such a processor to NFAC production offices will be substantial. For example:

- The OER linked econometric model of major western economies now requires over 30 CPU minutes per run and gets currently about a single run turn-around per work day.
- The OGSR CHALLENGE model now requires 30-60 CPU minutes per run and gets currently about a single run (or several late night runs) turn-around per work day.

These are but two examples of NFAC applications that will be considered for the parallel processor. The processor can provide for quicker and much more frequent turn-around of applications such as these. It will facilitate experimentation and allow for more exploitation of data due to timing considerations. Analysts will be able to, on one hand, be more speculative and be able to, on the other hand, do more fine tuning of applications when they are able to turn jobs such as these around in minutes rather than hours. In the case of CHALLENGE, over 100 runs are required to fine tune a new version of the model. One run (or several late night runs) turn-around of the model per day is very restrictive. The more timely the runs, the quicker the feedback, and the more experimentation analysts can perform. (C)

E. Time Phasing

In the first year we will bring in the basic parallel processor system and begin experimentation with appropriate existing applications on the system. In the second year we will expand the hardware to accommodate more experimentation with new applications. (U)

IV. Intelligence Community Applicability

Information on our experience with such a device, from a technical standpoint will be available to the Intelligence Community. We will also make available software and system information--barring proprietary limitations. (U)

V. Intelligence Consumer Benefits

Increased experimentation with and usage of computation intensive applications will improve and broaden the scope of our intelligence product and consequently will benefit consumers. (U)

VI. Probability of Success

The probability of success is high. High speed parallel processors of the type described above should be available by FY 1983 from industry to provide incredibly fast processing times for many computation intensive computer applications. Such processors will provide a practical means for experimentation with large computation intensive applications. (U)

B

I. PROJECT TITLE: EXPLOITING POLITICAL AND SOCIAL DATA

Submitting Agency: CIA

II. COSTS: [redacted] 25X1

III. DESCRIPTION OF PROJECT

A. Statement of need:

Intelligence analysis is often constrained by limitations in readily available data. To the degree that information is difficult to identify and manipulate, it will not be incorporated in intelligence production. In practice, this has meant that a vast array of political and social information--on public opinion, social trends, and domestic confict--has remained largely untapped by NFAC analysts. When analysts assess political and social conditions, such as the potential for political instability, the effectiveness of foreign government policies, or support for its foreign policy, they, therefore, often rely on incomplete information.

This situation calls for the creation of a unique intelligence resource: a data archive of important political and social information and the means for analysts to easily use this information in their everyday work. [redacted] 25X1 25X1

[redacted] To make these data readily accessible by analysts, an extensive interactive computer software system would need to be developed. The result would be an archive more extensive and timely than any that currently exists in either the public or private sector; one with sophisticated retrieval and analysis capabilities that would significantly enhance the depth and quality of NFAC analysis.

B. Current status:

The Intelligence Community is embarking upon an extensive effort to upgrade its capabilities to monitor socioeconomic trends in foreign countries through increased use of external data bases, such as those of the Bureau of the Census, and by more intensive analysis of these data. This is a vital effort. Rarely, however, can one infer political consequences from socioeconomic trends alone. To make this linkage, we need an in-house capability to store and retrieve not only socioeconomic information, but also information of a more political nature as well. For example, the

historical relationship between inflation rate and a leader's popularity or the incidence of domestic protest could be quickly measured statistically and graphically. More complex models would lead to forecasts of stability within a country.

[redacted] 25X1

The rapidly-increasing availability of information in computerized formats, the projected arrival of large numbers of computer terminals in NFAC offices, the development of analytic aids through ORD's Intelligence Production Laboratory project, and Agency acquisition of sophisticated computer graphics systems will soon make possible a thorough and systematic exploitation of political and social data. These new data and analysis tools will be of particular importance for the new political instability and terrorism analysts in NFAC.

C. What is required:

External research funds will be used to hire outside contractors to complete four basic tasks:

1) Development of a computer software system that will allow analysts to make queries regarding the availability of data on their country or issue and conduct simple statistical analyses. This would involve the capability to interface with computer packages -- including graphics support -- already available on the Agency's computer system or currently under development. The computer software development is vital if maximum utility is to be derived from these data. The system we envisage would permit the analyst to specify a country, region, or issue and receive at the terminal an inventory of available archive data by time period. The system would then query the analyst about his or her interests. At each point, the analyst would make choices, receive results, process data statistically or graphically, save files, and otherwise manipulate the data in an interactive way. Only by making the information readily available and easily usable will its full benefit be realized.

[redacted] 25X1

3) Transcription of socioeconomic data and election returns from published documents to computerized formats.

4) Coding of politically relevant events, such as acts of terrorism, insurgency and government reprisal within countries. OPA currently has such a file in the archive on 136 countries for the period 1948 to 1977. The contractor would bring the file up to date.

D. Implementation and timing:

We do not anticipate that these tasks will be implemented by the same contractor. OPA will have overall responsibility. The computer software development will be done in consultation with ODP. It is assumed that major portions of that work will have to be contracted out, since the task is likely to exceed ODP's available resources. External contractors are the most appropriate means for data collection and preparation because of the need to develop an extensive set of historical files at the beginning. Once the historical baseline has been developed, the archive will be updated and maintained in-house, supplemented by a minor investment of office external analysis funds when required.

If this project is funded, the OPA will conduct an ADP requirements study during FY82 and locate, through competitive bidding, contractors able to perform the related tasks, so that there would be no delay in getting started in FY83.

IV. INTELLIGENCE COMMUNITY APPLICABILITY:

The archive would constitute a unique resource within the Intelligence Community that could be used by NFAC analysts via their SAFE terminal in either VM or Batch mode, but would also support requests for analysis from DIA and State. The computer-based retrieval and analysis capability will be developed with such flexibility that additional data bases could be added to the system in the future. OER's TRADAR data base, for example, will be linked to this system.

V. INTELLIGENCE CONSUMER BENEFITS:

The development of an archive of this sort responds directly to one of the basic issues involved in improving the quality of analysis--namely, insuring the systematic analysis of the most comprehensive data available. Consumers would benefit by getting products whose judgments are derived from the best available information.

VI. PROBABILITY OF SUCCESS:

While the data archive would be a unique resource, there are no known technical or administrative obstacles to its development. We anticipate that a significant amount of time would be needed to familiarize analysts with its capabilities and use.

C

I. PROJECT TITLE: Nonfuel Mineral Supply-Demand Data Base

Submitting Agency: CIA

II. COSTS: [redacted]

25X1

III. DESCRIPTION OF PROJECT:

a. Statement of need:

There is a persistent and justifiable Federal policy concern with the vulnerability of the United States and its allies to interruptions in the imports of nonfuel minerals that are critical to the maintenance of defense or essential civilian production or to the general strength of the Western economies. The United States, Western Europe, and Japan all import more than 90 percent of their requirements of such important minerals as manganese, cobalt, chromium, and bauxite; interruptions would severely affect steel production (manganese), stainless steel output (chromium), and the manufacture of jet engines (cobalt and chromium), among other industries. The United States is also dependent on imports of columbium, tantalum, and platinum, which are critical to such industries as jet engine manufacture, metal working, electronics, and petroleum refining.

The risks of supply disruption are magnified by the restricted availability of these minerals: chromium comes overwhelmingly from South Africa, platinum-group metals mainly from South Africa and the USSR, manganese from Gabon and South Africa, cobalt from Zaire and Zambia, and tantalum from southeast Asia. In short, these and other critical minerals are disproportionately imported from areas that are especially subject to instability or politically motivated supply interruption.

In response to this problem, the Agency has intermittently carried out ad hoc analyses of particular mineral supply or contingency situations, and its Resource Analysis Branch (ERAD/OGSR) has initiated a series of System Dynamics modeling efforts designed for systematic evaluation of the many influences, including political and commercial, that impinge or may impinge on the international flow of important nonfuel minerals. Such efforts, however, are hampered by the lack of comprehensive, systematically compiled and coordinated governmental and private information bearing on future nonfuel mineral consumption and supply. It is believed that the proposed effort would greatly enhance the potential for quicker, more penetrating, and more reliable evaluative efforts. While a substantial commitment of resources would be needed to establish the system, the maintenance cost should be relatively modest.

b. Who will accomplish:

The proposed data base would be maintained by Resource Analysis (RA) Branch staff after having been established as the result of both staff and contract efforts. It would rely largely on already ongoing effort, in the sense that it would combine and coordinate those relevant governmental and, possibly, commercial data bases already in existence or under development. Crude data and intelligence that is reported currently in a variety of open and classified sources would also be assimilated and coordinated.

c. What is to be developed:

The proposed data base would consist of a variety of separate data sets, both quantitative and narrative, on consumption, capacity, production, inventories, prices, and recycling, as well as on the relevant economic, political, psychological, geographic, institutional, and other determinants of those variables. Predictions made by other authorities would also be included—especially predictions or contingency scenarios that relate to the risk of future supply problems. These data sets would be maintained on disk and magnetic tape files accessible through the CIA VM system, which would be programmed to provide both machine readable output and printouts suitable for distribution or for inclusion in finished reports. Adjunctive use would also be made of the MAGAS system to provide a variety of graphic displays and cartographic arrays.

Under appropriate safeguards, the data sets would be made accessible in part to other government agencies, and efforts would be made to maximize, to the extent practicable, the automatic assimilation of data sets and inputs available from these other government agencies, as well as within the CIA itself. Following the practice of other government agencies, efforts would also be made to make the unclassified (security or business) portion of the data base available, through an appropriate agent (governmental or nongovernmental), to outside researchers and the general public.

The data sets would be established and maintained for each of the important commodity forms of those nonfuel minerals (tentatively, some 15-20) selected for their importance in the general economy and/or their critical defense applications. Particular priority would be given to those minerals characterized by the greatest apparent risk of potential supply problems. Part of the initial project for establishing the data base would be the review of selections and selection processes already used by other Federal agencies. To the extent possible, advanced forms of a particular mineral would be linked to the specific sources of contributory inputs and cruder forms would be linked to the specific processors which consume them.

Information on relevant determinants would be kept in separate data sets, code-linked to the particular minerals and commodity forms to which they were relevant, and there would be similar,

reverse linking of the particular mineral commodities to the determinants. These determinants would include not only macroeconomic, financial, and end-use consumption information, but institutional and political factors affecting production or consumption in particular places, including specific business interrelationships. Care would be taken to include political and business-relationship factors that would be likely to affect the volume and direction of supply in a stringency or contingency situation.

The data sets would consist not only of crude statistical and narrative inputs, but of such analytical summations and manipulations of the data as were determined to be useful on a routine basis. Reports would be examined for apparent original source and duplicate reports eliminated (with preference being given to the retention of the least highly classified), except as duplication (or partial duplication) seemed to be useful for purposes of corroboration or clarification; procedures would also allow for the routine replacement of original reports in their entirety, where warranted, by analytical summaries, conversions, or abstracts.

Apparently contradictory statistical data sets would be maintained, as seemed useful, with cross-references to explanations of the reasons for apparent or actual discrepancies; this would be particularly in order for statistical data sets in common use, including preliminary versions of statistics subjected to later adjustment. Annotations would include reasons for preferring particular statistical sets for particular applications. Routinely compiled composite, synthesized, or converted data sets deemed to have useful analytical application would likewise be included. All of the data sets used in the System Dynamics modeling would be included, with the annotations in the computer file serving as the necessary documentation.

Access to, and maintenance of, these files would require additions to the present complement of computer terminals. The corresponding offset would be a material reduction in the need for individual file-keeping. The proposed data base would entail some small overlap with the computerized document service of the Office of Central Reference, but would differ from the latter in its organization and in its inclusion of processed rather than crude intelligence; the OCR data base would be a key source for initial file establishment. There would also be small overlaps with the USGS Computerized Resource Information Bank (CRIB), the Bureau of Mines Minerals Availability System (MAS), and other Bureau of Mines computerized files (such as one on aluminum processing facilities and a developing Automated Mineral Information System (AMIS); to the extent feasible without sacrifice of analytical capabilities, summary or synthesized output from these or other relevant files would be utilized in lieu of raw records.

d. Time phasing:

Since the proposed data base consists of a number of discrete segments and sources, it can be phased in over a period of time and yet be useful as soon as the first segment is in place and accessible. Nevertheless, it is assumed that the bulk of the work of establishing the data base can be accomplished, under one or more outside contracts, during the first year of the program, with practical application and "debugging" commencing late that same year.

Several concurrent operations would be initiated within the first few months of the first year, including, tentatively: design and award of contracts for reconnoitering, appraising, and, if appropriate, designing procedures for the incorporation of one or more governmental data bases; in-house investigation of the optimal means for incorporating material from the OCR and other intelligence community files; and staff exploration with the Office of Data Processing (ODP) of the optimal means for assimilating inputs into the proposed file, maintaining the file, providing both for restricted and unrestricted access, and linking the file with the System Dynamics models and other computerized operations.

The second half of the first year would see the initiation of staff work or contract design and award for follow-up with regard to gaps in the system or, if necessary, improvements in system design. In particular, the initial assessment of privately maintained data bases may reveal a void needing to be filled by original collection and coordination of published reports bearing, particularly, on announced plans and projects for establishment, expansion, or contraction of mineral extraction and processing capacity. Work on this or other supplementary contracts, if required, would be carried on mostly in the first half of the project's second year. The third year of the project would find the data bank in full current operation, though still on a "shakedown" basis. The amount budgeted for the fourth year is the estimated level of continuing operating expense for the mature system, subject only to later inflationary escalation.

In the detailed scheduling, priority would be given to those minerals and those elements of the system that were most relevant to providing assessments of situations with apparently greatest risk and most serious consequences of a supply contingency.

IV. INTELLIGENCE COMMUNITY APPLICABILITY:

The project might pioneer some methods of data banking and access —particularly with regard to varying degrees of access by varying categories of users — but this would be only an incidental and possibly not too visible by-product. It may also lead to the development of new techniques for the screening and integration of partially or wholly inconsistent reports on the same subject. In the development of the project, previous experience of this sort would be reviewed, to the

extent practicable, and information on any apparently useful new experience gained would be disseminated to the intelligence community.

V. INTELLIGENCE CONSUMER BENEFITS:

The principal benefit to intelligence consumers would be a considerably enhanced capability both for foreseeing the emergence of potential mineral supply problems and for evaluating the implications of contingency, policy, and other scenarios affecting mineral supply. These benefits would accrue both from direct evaluation of the entries in the data base and -- especially for longer term problems -- use of the data base in the System Dynamics models. Of a comparable order of benefit would be the vastly increased productivity of each hour of RA analyst time — sufficient, it is believed, to provide a substantial net benefit over and above the costs of establishing and maintaining the data bank. It is believed, furthermore, that as familiarity with the data base spread to other parts of the intelligence community, significant cost and time savings would be effected for other analysts as well.

VI. PROBABILITY OF SUCCESS:

There has by now been a sufficiently large body of successful experience with large data banks — both numerical and narrative and particularly within the CIA -- that the probability of success for the one here proposed is very high. Furthermore, the proposed data base would be a success in terms of its productivity, quality, and cost aspects even if particular parts of it failed to be achieved. Although some risk exists with regard to the costs and degree of effectiveness with which the objectives — including both original establishment and later upkeep -- are accomplished, it is very unlikely that the outcome would be such as to negate in its entirety the potentially large excess of net benefit.

D

I. PROJECT TITLE: Computer Technology Research

Originator: CIA/OER/DAC

II. COSTS: [redacted] 25X1

III. DESCRIPTION OF PROJECT:

a. Statement of need:

The Agency is now spending more than [redacted] 25X1 dollars per year on computers, in order to increase the productivity of NFAC analysts. Our success will depend on how we spend the money.

Computer technology is advancing very rapidly. Each year, trade journals such as Datamation offer thousands of pages of advertisements of new hardware and software systems. Even in very specialized areas of computer science, such as the design of software for information storage and retrieval, there are dozens of alternative software packages.

It is extremely important for the Agency to keep up with the advances in computer technology, as they relate to intelligence analysis. We tend to regard computer technology as being fixed, and the number of NFAC analysts as being variable. Unfortunately, we can not expect to gain much from this focus on labor alone. With our present limitation on office space for analysts, there is no way that we can double the quality of intelligence by doubling the number of analysts. A better option is to regard the number of analysts as fixed, and to think of computer technology as a key variable in determining analytical productivity in NFAC.

Solid, thorough research is necessary to keep up with advances in computer technology. The advertised capabilities of new software products sometimes do not match reality. Therefore, it is necessary to test the new developments that seem most promising. Research and testing in this area require time and money, just as in any other field.

25X1

[redacted]

Consequently, it seems reasonable to begin and continue a small program of technology research aimed at assessing new developments in computer software, as they relate to intelligence analysis. The research could be done by an external contractor working with OER, OPA, and other NFAC offices.

This program of technology research would fill a major gap. Presently, the Agency's Office of Research and Development has a responsibility to develop new computer software packages, buy not to find and test software that has already been developed. The Office of Data Processing (ODP) evaluates new computer hardware, but ODP relies on NFAC for suggestions of software in support of intelligence analysis. Project SAFE has involved research on software for document storage and retrieval, but this is a small part of a large pie. Of more than [redacted] dollars spent by ODP in support of NFAC in FY80, less than 10 percent was for SAFE. We need to pay more attention to the remaining 90 percent of the ODP budget for NFAC, much of which is driven by NFAC's recommendations and use of computer software for analyzing numerical data. 25X1

b. Initial phases:

The funds requested for FY83 are to cover the testing of successors to our present system of data storage and retrieval, namely the RAMIS package that is used extensively in OER, OPA, and elsewhere throughout the Agency. OER and OPA would develop criteria for testing new systems of data storage and retrieval. These criteria would be applied by an external contractor to systems suggested by OER and OPA, along with other systems suggested by the contractor. At the end of FY83, a decision would probably be made to purchase a new package, for approximately [redacted] 25X1
Thereafter, the research on new software continues at an annual rate of [redacted] while [redacted] per year is allocated for purchasing new systems based on the research. 25X1

IV. CONSUMER BENEFITS:

This project would develop more sophisticated computer software, so that analysts could create their own files of machine-readable data, and access these files. OER would benefit from this effort in the areas of international arms trade, shipping, and finance, and in narrower areas of research on specific industries and commodities.

V. COMMUNITY BENEFITS:

New systems for accessing certain databases would naturally be available to other intelligence agencies. In particular, the Defense Intelligence Agency has already requested a cooperative effort on our database of international arms sales, along with the National Security Agency.

VI. PROBABILITY OF SUCCESS:

This project is too risky to be funded under normal budgets. It is possible that we are now using the very best computer technology for our work, and that we will keep pace with developments in the field, so that additional research in this area would yield no payoff. On the other hand, for an amount not to exceed two percent of our current annual expenditures on computers for NFAC, a new program of software research might easily double the productivity of our computer system for intelligence analysis.

E

PRODUCTION ENHANCEMENT INITIATIVES, FY-83

I. PROJECT TITLE: Weapons Intelligence Analysis Center

Submitting Agency: CIA

II. COSTS: [redacted] 25X1

III. DESCRIPTION OF PROJECT:

a. Statement of need:

There is a requirement for the application of interdisciplinary analysis and seldom-used creative problem-solving techniques to the solution of complex weapon systems problems. An innovative method of proposing solutions and/or new directions to perplexing and enigmatic intelligence problems would encompass some of these techniques and apply multidisciplinary knowledge and experience to weapon systems analysis.

Formal analytical techniques, technical education, and experience are important factors in weapon systems analysis and results of such analysis can be satisfactory. However, it is difficult for analysts in these disciplines to step away from mind-sets, particularly on well established or well understood weapon systems. Moreover, the pressure of production schedules and the tendency of analysts to extrapolate from experience often leads to the submersion of unique ideas. Thus, we may be suppressing a variety of outlooks and limiting judgments and solutions to complex weapon systems problems.

The establishment of a Weapons Intelligence Analysis Center would provide the base for applying creative problem-solving techniques and interdisciplinary analysis to weapon systems problems.

b. The Weapons Intelligence Analysis Center

The proposed analysis center would be permanently staffed by a small number of personnel headed by a staff manager. They would be selected for their knowledge and abilities in creative problem-solving techniques and criteria. The staff would provide the organization, logistics, and guidance for problem-solving projects and sessions. Specific enigmatic, complex, undefined, or ambiguous weapon systems problems would be submitted to the staff on an annual basis with priority and timeliness requirements established by the submitting component. Based upon the number of analysis projects to be conducted per year, the staff will select a number of candidate problems. For the first two years it is suggested that no more than five to seven problems be undertaken. Depending upon results and community support, this number could grow with time.

The Center's staff will select analysts from candidates submitted from components throughout the community with the limitation that only

a few weapon systems analysts be represented in a single analysis group. The number of analysts in a group should not exceed about [redacted] Group members must be released by their components for a specified period of time (perhaps two to four weeks) to work full time on the selected problem analysis. The analysis groups will be housed and operate in an environment completely removed from any interference and/or interrupting influences. Possible permanent locations for the center could include [redacted] Analysts selected will of necessity need some prior training in creative problem-solving techniques. Selection criteria will be developed by the staff. 25X1 25X1 25X1

c. The Product of the Center

The center will propose solutions to, or methodology for solving specific weapons system problems. In the case of ill-defined problems, the center may propose problem definitions. The formal output of the center might consist of one or all of the following:

Documented problem solutions or possible solutions.

Detailed methodology for obtaining a solution or solutions.

Documented ideas for obtaining either a methodology for or solution to a problem.

Formal reports containing any or all of the above.

d. Operation of the Center over Time

The first quarter of the center's operation will be used for developing and testing the methodology for soliciting candidate problems and analysts. Plans for assembling, housing and providing the proper setting for maximum output will be established. Coordination, logistics, equipment requirements, and general details of the operation of the Center will be finalized. In the last half of the first year selected problems will be analyzed. During the first quarter of the second year, the first year's operation will be evaluated. Refinement, changes, new procedures, additional equipment, permanent staffing requirements, etc will be implemented and tested. The center should be fully operational by the middle of the second year.

Reports to management of accomplishments and additional requirements will be formally documented at the end of each of the first two years. Each report will detail actions required by the center and actions required by management. The reports will detail areas of support or areas of non-support by the various components of the community.

IV INTELLIGENCE COMMUNITY APPLICABILITY:

The center will concentrate on applying varied creative problem solving techniques to complex and/or enigmatic weapon systems intelligence problems and solutions or results will be reported to all interested components within the community.

The limitations on the outputs will be those imposed by time, availability of proper equipment or facilities, support by management in providing the proper analytical mix of personnel, and security.

V INTELLIGENCE CONSUMER BENEFITS:

The long-term benefit to intelligence consumers will be better estimates and improved intelligence products with more comprehensive and easier to use judgements and/or alternatives. Products should be broader in scope and encompass the collective brain power which will result from multidisciplinary analysis. Products should be more reliable and potential errors should be minimized.

VI PROBABILITY OF SUCCESS:

The center if implemented properly and if supported by the community, should show successfull outputs by the second year which may be greater than anticipated. The success could be such that the envisioned center might be too small in the out-years to accomplish all that it could. However, the latter case would hold only if the operating components fully use the center's output and provide accurate and timely products to the consumer. The probability that this will occur will depend upon management support and analyst cooperation in the various community components. If there are some initial successes that exceed expectations support will certainly be obtained.

F

I. PROJECT TITLE: Center for the Study of Soviet Naval Tactical Warfare

II. COSTS:

25X1

III. DESCRIPTION OF PROJECT

A. Statement of Need

There is currently much debate over the capability of the US Navy to carry out its missions of sea control and projections of power ashore. As US dependence on Mid-East oil has increased, so have the concerns about the capability of the US to protect vital shipping lanes and, if necessary, to transport troops and equipments to remote regions and then provide extended logistical support. Accurate assessments of Soviet naval capabilities and intentions are vital as decisions about the size, capabilities, and composition of our navy are being made. These assessments require a thorough understanding of Soviet naval doctrine and Soviet perceptions of US naval capabilities. Additionally it requires an understanding of Soviet weapon systems, ships, submarines, and the means of integrating these elements into effective naval forces. It also requires an understanding of Soviet naval support entities that range from satellites for targeting naval weapons to supply ships for allowing extended naval operations. Finally it requires a broad understanding of Soviet and US naval programs in order to evaluate their comparative strengths and weaknesses.

Currently a number of efforts are underway within the Intelligence Community to evaluate elements of the Soviet Navy. However, these efforts are largely fragmented and the resultant products are not always effectively integrated into a comprehensive study of Soviet naval capabilities and intentions. The results are that gaps in our understanding are not readily identified and recommendations regarding data collections are often lacking. A single center for the study of Soviet tactical warfare could integrate the analytical efforts already underway, identify gaps in analysis and collection, initiate studies to fill the analytical gaps, recommend changes to fill the collection gaps, and, in general, provide a comprehensive product in Soviet naval tactical warfare. In conjunction with the US Navy many issues regarding future US programs could then be addressed in a more knowledgeable manner.

B. Who will Participate

The proposed center would be operated by existing OSWR/NSD staff with important input from OSR, and external contractors. Participation by other elements of the Community concerned with these problems would be enthusiastically pursued.

C. What is to be done

The Center will ultimately give definitive answers, based on an interdisciplinary approach, regarding the Soviet capabilities and assets available to initiate and sustain tactical warfare and Soviet doctrine regarding such warfare. In documenting this appraisal, the following more specific areas will be addressed rigorously:

- o Role of the Soviet navy as a tool to effect political goals and project economic/military power;
- o Soviet naval tactical doctrine
- o Naval command, control, and communications structures;
- o Methodology, procedures, and equipments used for battle management and pre-battle planning;
- o Soviet perception of US naval tactical warfare capabilities, assets, doctrine, etc.;
- o Capability of Soviets to acquire relevant intelligence;
- o Targeting against naval forces to include targeting assets, accuracies, timeliness, etc.;
- o Definition and evaluation of the ECM environment and assets available;
- o Naval systems capabilities, vulnerabilities, availability, numbers, deployment, technical parameters;
- o Human factors;
- o Equipment factors;
- o Factors in deciding whether to initiate nuclear tactical warfare or conventional tactical warfare;
- o Specific evaluation of important scenarios;
- o Changes in US collection of intelligence.

D. Time Phasing

In the first year we will extensively review Soviet naval doctrine for indications of Soviet naval goals. We will identify critical elements in our understanding of Soviet naval capabilities and initiate analytical efforts on those elements. We will attempt to integrate the massive intelligence effort already being expended on the Soviet Navy and determine if collection efforts can be initiated or redirected to answer questions that have previously been unanswerable. We will review Soviet reactions to current US naval programs and estimate Soviet reaction to future US programs.

Extensive analyses of critical Soviet weapons, radars, ships, submarines, satellites, and battle management assets will occupy the next two years. Additionally, we will have to acquire a thorough understanding of US naval programs and capabilities in order to view Soviet programs and capabilities in their proper context. The final year of the study will be spent evaluating the effectiveness of an integrated Soviet

naval force in achieving Soviet naval goals. Test cases in evaluating the validity of our conclusion will involve specific scenarios relating to vital US needs. For example, we will assess the capability of the Soviet Navy to impair the US Navy's capability to protect shipping lanes from the Mid-East oilfields in the face of determined Soviet opposition. Additionally intelligence requirements that cannot be fulfilled with current or planned collectors will be identified.

IV. Intelligence Community Applicability

The comprehensive methodology used by the Center could serve as a model for the entire US Intelligence Community. Additionally, the results of the analysis will affect analytical requirements and collection efforts at NSA, DIA, NISC, and CIA. Establishment of this Center will allow us to optimize collection of Soviet naval intelligence with current capabilities and define specific requirements for future collection.

Intelligence Consumer Benefits

If successful, this effort should greatly assist the US Navy in assessing the Soviet capability and assets available to conduct tactical warfare and in planning for future resources. Additionally it will aid a wide variety of US policy makers by better defining the strengths, weaknesses, and limitations of the Soviet Navy in thwarting US global plans. This effort will also serve as a valuable input into DoD officials and Congress in allocating future US military funds.

Probability of Success

This effort, if well managed and with selfless cooperation from Community agencies, has a high probability of limited success and could well prove to be very successful if cooperation exists at a high level. The greatest uncertainties concern the complexities of the problems, the sufficiency of the data, and the degree of interdisciplinary cooperation.

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I: PROJECT TITLE: Spatial Data Analysis Project

Submitting Agency: CIA

II: COSTS:

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III: DESCRIPTION OF PROJECT:

a. Statement of need:

The quality of intelligence products, particularly in the economic intelligence area, depends as much on the quality of the raw data used in analysis and the inferences that can be derived through comprehensive modeling of that data as it does on the expertise of the intelligence production analyst working the problem. In recent years the volume of data available to analysts has increased extraordinarily; the advent of electronic mail is an indication of the magnitude of this growth and the concomitant need to efficiently sift through the data, organize it, and present it in a manner most effective for meaningful analysis. At the same time, analytical efforts are necessarily growing in complexity with the recognition that many of the problems being addressed are affected by a growing number of variables that both interact with each other and have an impact on the end result. For exceptionally complex problems, the analyst must use sophisticated simulation models to determine likely outcomes and alternatives. This is particularly true where large geographic areas are a dimension of the problem, as is the case in a variety of natural resource analysis efforts underway in CIA.

In order to address these types of problems adequately, it is necessary to develop new and innovative ADP procedures and techniques, new software modeling approaches, and better interactive graphics support for the modeling efforts. Faster, larger-capacity computational capabilities are needed. Experience in OGSR has shown that natural-resource modeling efforts, which typically involve solution of complex, multi-dimensional estimative equations, tend to demand exceptional amounts of dedicated computer memory, use excessive amounts of processing time, and require special types of peripheral data processing equipment. Furthermore, these types of models are most effective when the analyst has quick and repeated access to them. The typical process involves frequent readjustment of variables until model output matches available data, followed by simulations of possible future alternatives and tests of modeling assumptions. Special-purpose data processing equipment is necessary to make this process most cost-effective.

In order to develop the requisite modeling capability it is necessary to significantly upgrade OGSR's MAGAS (Meteorological Agronomical Geographical Analysis System)--which presently provides primarily interactive graphics analysis and cannot handle large

models--through procurement of appropriate complementary processing equipment; in our experience existing OGSR and Agency computers cannot address these types of modeling needs with the necessary efficiency. The models OGSR would like to use to help its analysts work with the large volumes of available data (many of these models have already been acquired by CIA) will then be adapted to the processing equipment through specialized programming assistance.

Both the equipment and programming needs can be met quite readily. In industry, special-purpose computing systems employing array processors tied to minicomputers (which are enormously efficient in solving the types of "number-crunching" partial differential equations resource models typically use) are being developed for just such applications. The added computing capability that will make MAGAS compatible with these array processors is available in industry, and most of the models OGSR is interested in using have been (or can readily be) adapted with minimal programming. It is therefore in the interest of significantly increasing analyst efficiency and analytical capabilities that we propose the Spatial Data Analysis Project, through which these OGSR needs will be defined and coordinated, a system capable of meeting them will be built, and the desired models will be installed on the system.

b. The Spatial Data Analysis Project

In the first phase of the Spatial Data Analysis Project anticipated OGSR modeling needs during the early 1980's will be identified and the system capabilities necessary for satisfying them will be defined. The OGSR experience with MAGAS and current computer modeling efforts in the agronomic, narcotics and petroleum resources areas will be evaluated to help determine potential modeling and system needs in such topical areas as foreign agriculture estimation, food and population assessment, water resources assessment, demographic change and migration, and transportation network assessment. Based on these needs, a unique special-purpose minicomputer-based system that will meet the dedicated use and special interactive graphics requirements of OGSR will be designed. Such a system would in all probability involve a direct supplement to the existing MAGAS system, which is already fulfilling a vital role in graphics support for many of these analytical efforts.

The second phase of the project would concentrate on systems and software procurement/enhancement; in FY 1983 [redacted] would be used to acquire an array processor and [redacted] to upgrade MAGAS to give the added computational capabilities to make it compatible with the array processor. The third phase would involve training and applications development; [redacted] in FY 84 and [redacted] in FY 85 would be devoted to contract programming to adapt relevant models to the system. 25X1 25X1 25X1

Approval of the Spatial Data Analysis Project would provide for a logical enhancement and expansion of existing analytical acti-

vities and capabilities in OGSR and would result in a consolidation of many OGSR data processing efforts. The Project would have a high probability of success and would involve a relatively small investment of funds.

c. What is to be Developed:

The Project will implement new and innovative ADP hardware and software techniques with the goal of improving the quality of OGSR's intelligence products in its Geographic Research and Environment and Resource Analysis Programs. Specific areas that will be addressed in developing these capabilities include:

- o Petroleum analysis software and estimative techniques applications
- o Spatial inference modeling in support of geographic, environment and resource issues
- o Improvement of graphical analysis capabilities and procedures
- o Alternative methods for processing, exploitation and presentation of analytical data

d. Who Will Accomplish

The proposed OGSR Spatial Data Analysis Project would be operated by existing OGSR staff with external hardware procurement, contractor development and software implementation and external consultant assistance.

IV. INTELLIGENCE COMMUNITY APPLICABILITY:

While the Project will initially concentrate on techniques of the most utility to OGSR's intelligence production program, the resulting research and analyses findings will be made available to the entire Intelligence Community, and it is logical to expect that the added modeling capability it will provide will support analytical efforts in other sectors of the Community as well as in OGSR and CIA should the need arise.

V. INTELLIGENCE CONSUMER BENEFITS:

The principal benefit to consumers is that policymakers will be able to have many of their queries on natural-resource-related issues currently handled by OGSR answered far more quickly and definitively than is now possible. The effects of alternative policies could be examined rapidly with a high degree of confidence because all of the available data can be taken into account in each case. The costs of these analytical efforts would be minimized through the use of a dedicated modeling system of this type because contractor/consultant efficiencies would be greatly improved by the rapid turnaround and extended computing capacities that would be acquired. Operational efficiency of all CIA computer-using

analytical efforts would be improved because the Project would divert a significant number of large, time-consuming analytical programs from Agency mainframes to a system that both would handle them much more rapidly and provide the unique interactive graphics that make such large-scale programs so useful for analysis.

VI. PROBABILITY OF SUCCESS:

The probability of success for the Spatial Data Analysis Project is high, as much of the software that OGSR is interested in using has been acquired or is available in industry, and most of the rest is well along in the development phase. The necessary ADP hardware that would support OGSR objectives is also in existence in industry or in the final stages of development. The chances of blending both the new hardware and programs with the existing MAGAS system appears excellent, since the requisite array processing technology has already been melded with similar PDP equipment successfully. The implementation of the new analytical procedures and techniques that would follow will greatly enhance current analytical efforts and will break new ground in the area of improved quality, timeliness and completeness of intelligence research and analysis products in OGSR.

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I. PROJECT TITLE: Industrial Analysis Forum

Submitting Agency: CIA

II. COSTS:

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III. DESCRIPTION OF PROJECT:

a. Statement of need:

Present analytical capabilities of CIA's National Foreign Assessment Center preclude producing finished intelligence which integrates specific industry knowledge, multicountry political economy and knowledge of the world market, to generate world-wide, in-depth perspective on key industrial policy issues.

DOD has sponsored some research in strategic materials and U.S. industrial capacity. Department of Commerce has accumulated vast stores of fragmented industry data. But the Intelligence Community lacks the ability to provide policy-makers with timely unbiased and comprehensive analysis of major industries in an international setting. Within NFAC, the Office of Economic Research has recently formed an Industrial Organization and Analysis Branch to provide such analysis.

Given the limited resources of NFAC, the fact that the Branch will be charged with breaking new ground in both assembling raw data and production, and the need to quickly develop a capability to produce finished intelligence, OER is requesting additional funds to expand the Branch's activities in innovative ways.

The Branch will have the responsibility within NFAC for research, analysis and reporting on the role of foreign governments and industry in technological development, and industrial strategies which may evolve from those achievements. The Branch will work closely with OSWR in assessing the technology strategies of selected high-technology industries. It will highlight perceived threats to the U.S. and allied industrial base and resulting national interest concerns. The

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The problem is to insure that industries, and sectors within industries, are properly understood.

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V. CONSUMER BENEFITS:

This proposal will access important, substantial resources to the Intelligence Community, improving our capability of providing good, timely policy support on an important subject: the parameters and dynamics of threats to the U.S. and allied industrial base, and the role of foreign governments in technological and industrial development.

VI. PROBABILITY OF SUCCESS:

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We would expect that this new and more coherent approach will turn up information not presently available to the Intelligence Community, especially in Free World countries, and lead to sharply defined external analysis contracts with funds earmarked for the out-years of the program.

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Approved For Release 2008/07/25 : CIA-RDP85M00816R001100160001-3

I. PROJECT TITLE: SYSTEMS MODELING CENTER

Submitting Agency: CIA

II. COSTS: [redacted] 25X1

III. DESCRIPTION OF PROJECT

A. Statement of need:

The increasing need for multi-disciplinary teams in the analysis of complex intelligence questions poses the problem of how different types of expertise and information can best be combined. Existing mechanisms for combining the expertise of several disciplines into intelligence products are deficient; genuine synthesis rarely takes place. Clearly, alternative mechanisms need to be developed. In this regard, formal modeling of complex intelligence problems has distinct advantages in a multi-disciplinary environment. Working as a team, analysts bring together their particular contributions, but are required to come to a common understanding of the factors that shape the situation. Modeling allows the analysts to explore the interactions between political, social, economic, and military factors in ways that are simply not possible through conventional analytic approaches. Differences in viewpoint between team members can be explored through the development of alternative models. The outcomes of alternative models can then be compared and evaluated--leading analysts to a better understanding of the impact of their differing views. Whether or not the results of the formal model are explicitly incorporated into the final intelligence product, the modeling effort will provide the analysts with a better understanding of the key assumptions of their analysis. In turn, this understanding will enable analysts to search more efficiently for needed information in the future.

B. Status and Requirements:

NFAC analysts are generally unaware of formal modeling techniques of potential applicability to intelligence problems, such as system dynamics, linear programming, difference equations, artificial intelligence, and applications of graph theory. What is required is the establishment of an NFAC resource unit that could provide assistance to analysts, particularly those involved in multi-disciplinary work. Regional units that cut across office lines would be especially in need of assistance. External research funds will be used to hire outside consultants and contractors to provide the necessary expertise.

C. Implementation and timing:

During FY82, NFAC will survey the modeling abilities of its analysts, arrange with OTE to strengthen those abilities through training, and evaluate the approaches identified by ORD in its Intelligence Production Laboratory project. We anticipate that the need for outside assistance will decline from FY83 to FY85 as in-house capabilities are developed.

IV. INTELLIGENCE COMMUNITY APPLICABILITY:

The systems modeling center will be an NFAC-wide resource whose primary clients would be interdisciplinary teams or regional units. It would also serve individual analysts working on complex intelligence problems that lend themselves to a more formal approach. As expertise grows within NFAC, greater interaction with DOD modeling units can be anticipated--particularly when the problems being addressed contain a large military component.

V. INTELLIGENCE CONSUMER BENEFITS:

The development of modeling skills in NFAC will improve the quality of interdisciplinary analysis and lead to more forward-looking estimative work. By being based on models where the assumptions are explicit, policymakers will be better able to identify the critical factors shaping intelligence estimates. Models also offer policymakers the opportunity to simulate the impact of alternative policy choices.

VI. PROBABILITY OF SUCCESS:

There are no known technical or administrative obstacles to the enhancement of formal modeling skills in NFAC. We do anticipate some time lag before a majority of NFAC analysts will feel comfortable with these new techniques.

Attachment B

5 June 1981

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DDS&T/ORD FY-83
Production Enhancement Proposals

($000)

	FY-83	FY-84	FY-85
Large Scale Econometric Modelling System			
Advanced Cartographic Support System			
Water/Rail Transportation Assessment			
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Multidisciplinary Military Research			
Advanced Computer Techniques for the Production and Interpretation of Finished Intelligence Products			
Digital Back-Issue FBIS Dailies			
Cost Estimation Methodology for Non-Market Economies			
Analytical Skills Enhancement Program			
TOTALS			

Attachment C

5 June 1981

NFAC COMBINED RANKING
NFAC/ORD FY-83 Production Enhancement Proposals

($000)

		FY-83	FY-84	FY-85
PMES	Computer for Experimentation with Large Computation Intensive Applications			
OPA	Exploiting Political and Social Data			
OGSR	Nonfuel Mineral Supply-Demand Data			
ORD	Large Scale Econometric Modeling System			
OER	Computer Technology Research			
OSWR	Weapons Intelligence Analysis Center			
OSR/ OSWR	Center for the Study of Soviet Naval Tactical Warfare			
OGSR	Spatial Data Analysis Project			
OER	Industrial Analysis Forum			
ORD	Advanced Cartographic Support System			
ORD	Water/Rail Transportation Assessment			
PMES	Systems Modelling Center			
ORD	Multidisciplinary Military Research			
ORD	Cost Estimation Methodology for Non-Market Economies			
ORD	Advanced Computer Techniques for the Production and Interpretation of Finished Intelligence Products			
ORD	Digital Back-Issue FBIS Dailies			
ORD				
ORD	Analytical Skills Enhancement Program			
	TOTALS			

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