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THESIS

**Rate Stabilization at Navy Industrial Fund
Research and Development Activities**

by

**Joel David Kramar
and
Ernest Arnold Solberg**

December 1976

Thesis Advisor:

J. C. Tibbitts

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Rate Stabilization at Navy Industrial Fund
Research and Development Activities

by

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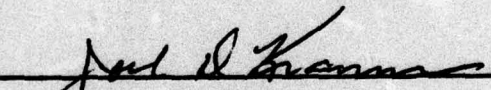
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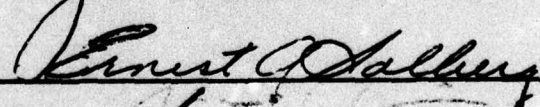
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requirements for the degree of

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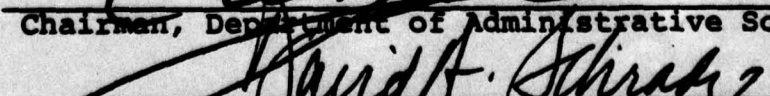
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ABSTRACT

Recently the Assistant Secretary of Defense (Comptroller) directed that all DOD industrially funded activities bill their customers on the basis of stabilized rates. Industrially-funded R&D activities are included in the policy change.

The writers address the subject of stabilized rates at R&D activities. The writers (1) identify the policy change, (2) trace its emergence in the DOD organization and (3) assess potential impacts.

The writers conclude that stabilized rates are more appropriate for non-R&D activities than for R&D activities. However, stabilized rates are workable in the R&D environment as long as it is recognized that the R&D workload is essentially a level-of-effort concept, and as long as minimal adjustments to locally established rates are made at higher levels.

Sources of information included official correspondence and interviews at selected Navy Laboratories and other NIF activities.

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I. RESEARCH PROBLEM

Government in-house laboratories provide a significant portion of the research and development capability in the United States. In Fiscal Year 1971, in-house laboratories accounted for over four billion dollars or about twenty-five percent of all Federal R&D appropriations for that year. Department of Defense in-house laboratories accounted for about two billion dollars or one-half of the in-house effort. [Ref. 1, pp. 13, 14] The volume of funding alone clearly attaches critical importance to the quality of in-house laboratory management. The key nature of military research and development as a determinant of tomorrow's defense posture expands the importance beyond relative dollar magnitudes.

This thesis addresses itself to the subject of stabilized rates at the Navy in-house laboratories. The phrase "stabilized rates" refers to fixed billing rates, representing a change in the way laboratories and other industrially-funded government activities price their services. In examining the new policy, this thesis will attempt to (1) explain why the change occurred, (2) how it works, and (3) how it will affect laboratory management.

A. DESCRIPTION OF THE PROBLEM

Over the last several years, the concept of stabilized rates has steadily gained impetus as a desirable intra-governmental transfer pricing technique. Under this concept,

government industrial-type operations such as Public Works Centers employ fixed, pre-published prices in billing their customers.

Official support for this policy became visible in 1974 and resulted in a series of directives and position papers from various government agencies. The evolution of the policy is described in Chapter III of this thesis. By 1975, the Assistant Secretary of Defense (Comptroller) promulgated a mandate that DOD laboratories operating within service industrial funds would bill their sponsors on the basis of predetermined rates, fixed on an annual basis and published in advance.

The mandate requires a basic change in customer billing by the laboratories. This might properly be considered a change in the method of intra-governmental transfer pricing. The output of Navy laboratories is research or technology development at the highly uncertain front-end of a weapons system acquisition cycle, rather than standardized products or services. Therefore, Navy Laboratories bill their customers on the basis of inputs (resources used) rather than outputs. The customer is most often paying for a best effort versus a product.

Prior to stabilized rates, the customer was always billed on the basis of actual costs plus allocated overhead. The policy change, which is the subject of this thesis, modifies the billing basis so that the customer will be billed actual direct labor hours times predetermined fixed rates.

As required by industrial fund accounting, the stabilized rate includes an acceleration (a percentage charge) of the basic labor rate to provide payroll benefits and overhead. A comparison of the basis for establishing rate factors between the prior method and the method under stabilized rates is shown in Figure A.

Let T = total charge for one effort

H = actual hours worked

D_r = hourly rate for direct labor

O = total overhead rate (G&A and indirect)

k = acceleration of direct labor for payroll benefits

Customers are charged for labor and overhead on the basis of the following formula:

$$T = H(D_r + k D_r + O)$$

The components of the customer bill compare as follows:

Figure A. Basis for establishing rate factors

Item	Old Method	New Method
Direct Hours (H)	Actual	Actual
Rate of acceleration (k)	Adjustable	Pre-set fixed for one yr.
Direct labor rate (D_r)	Actual	Pre-set fixed for one yr.
Overhead (O)	Adjustable	Pre-set fixed for one yr.
Total Rate	Combination of actual and adjustable terms	Pre-set fixed for one yr.
Material	Actual	Actual

It is not correct to characterize stabilized rates as falling in the category of either firm fixed prices or standard cost. The price charged a customer is based upon actual labor times a fixed rate. No standard cost concepts are involved as the policy relates to pricing not costing. There is no "should cost" rationale underlying the setting of the rates.

In summary, the stabilized rate policy being required by ASD(C) differs from existing practices as follows:

1. Rates must be published in advance whereas no such requirement has historically existed.
2. The rate is fixed in the aggregate whereas the historical rate was made up of actual direct costs and adjustable allocated costs.
3. Rates require approval through administration channels by ASD(C).

B. THESIS OBJECTIVE

This is a problem oriented thesis. Even as stabilized labor rates are being implemented at Navy Laboratories, there are substantive issues to be resolved. Stabilized rates are still evolving. There is wide-spread concern among laboratory managers about possible consequences of implementing stabilized rates.

The objective of this thesis is, so far as possible, to assess the impact of stabilized rates. This can be organized into three segments as follows:

1. The impact of stabilized rates on the integrity of the Navy Industrial Fund.

2. The impact of stabilized rates on the management of Navy Laboratories.
3. The impact of stabilized rates on the weapons system acquisition process.

C. APPROACH

The evolutionary character of stabilized rates in laboratories has, more than any other factor, shaped the approach employed herein. As a problem-oriented thesis, this effort looks at a policy currently being implemented at field activities. All industrially funded Navy Laboratories converted to stabilized rates for Fiscal Year 1977, beginning 1 October 1976. An interesting and perhaps key aspect of stabilized rates is that significant portions of the working mechanisms are evolving even as implementation occurs. As a case study, stabilized rates differ from the stereotype version of policy implementation where policy changes are carefully planned in great detail prior to implementation. No value judgements are rendered here as to whether the concurrence of policy evolution and implementation should be regarded as good or bad.

The ultimate impact of stabilized rates is considered to depend upon details yet to be completely evolved. How stabilized rates are administered may have more to do with the ultimate verdict than the fact of stabilization itself.

A case study approach has been selected as the most useful format for this problem. Methodologically the subject is approached in the following five steps:

1. The Navy Laboratories and the environment in which they operate is described to provide a backdrop for the problem area.
2. A chronology of events to date is presented.
3. The basic and secondary issues are identified.
4. Probable impact is assessed noting that the impact will depend on details not yet worked out.
5. Since this is a problem thesis, certain recommendations are included for possible reading by individuals in the problem-solving arena. The purpose of the recommendations is usefulness and they are intended to assist potential readers in constructing a logical basis for making decisions.

The Navy Laboratories and the Navy Industrial Fund Accounting System (NIF) is briefly described in Chapter II. This is intended to provide the backdrop to the problem. Neither the description of the laboratories nor NIF accounting is intended to be exhaustive. The description focuses on what operates upon or is likely to be affected by the specific change being studied.

A review of the correspondence and interviews pertaining to rate stabilization are contained in Chapter III. Information was sought based upon case-study methodology. The information search was conducted as follows:

1. Search of relevant publications, periodicals, and unpublished material.
2. Official correspondence and position papers dealing with the issue of stabilized rates.

3. In-depth interviews at selected Navy, industrially-funded R&D Laboratories.
4. In-depth interviews at selected non-R&D Navy activities which are industrially funded.
5. Interviews with headquarters personnel involved in implementation.

The chronology of events to date is included as a logical part of the information presented in Chapter III.

Chapter IV contains the analysis of the stabilized rate policy. It identifies the primary and secondary issues involved including those which are unresolved. Secondly, it assesses the probable impact on the Navy Laboratories and the weapons acquisition process which Navy Laboratories largely exist to support. Uncertainty of outcome, especially with regard to policy details yet unresolved, becomes a major limiting factor in assessing impact.

The fifth and final chapter contains recommendations. The management objectives upon which the recommendations are made are implicitly stated.

II. BACKGROUND

A. INTRODUCTION

The Navy Laboratories with which this thesis is concerned are the ones which report to the Chief of Naval Material and the Naval Research Laboratory under the Chief of Naval Research. Currently eight such laboratories exist. Appendix A lists the laboratories by name and location and provides a brief summary of the assigned mission. Appendix B lists the civilian ceilings and total dollar volume for fiscal year 1973. The cash allocation (Corpus) is shown, if known, and the fiscal year 1976 dollar volume is shown for the laboratories where interviews were conducted. The mission of each laboratory is to be the principal Navy research, development, test and evaluation center for its area of expertise as described in Appendix A. The laboratories have historically provided the Navy with an in-house capability of complementing and monitoring the R&D effort provided by private industry. In some cases the laboratories have expertise which is not available in the private sector [Ref. 29].

The remainder of chapter two provides a brief outline of the establishment and operations of the Navy Industrial Fund (NIF). The assumption is made that the readers are familiar with the NIF system.

B. NAVY INDUSTRIAL FUND

Industrial funds were established to provide a means of financing the operations at those activities which provide industrial or commercial-type services or products. The Navy Industrial Fund was established under the provisions of 10 U. S. Code 2208 which authorized the Secretary of Defense to establish working capital funds and prescribe regulations governing the operations of the industrial fund activities [Ref. 2].

The regulations which govern the operations and accounting procedures of the industrial fund activities begin with DOD Directive 7410.4 [Ref. 3] and are further refined in the Navy Comptroller Manual [Ref. 4]. The specific accounting procedures for the RDT&E activities are contained in the Navy Industrial Fund Handbook, NAVSO P-3045 [Ref. 5].

The primary advantages of the industrial-commercial activity have been described as providing:

1. More effective means of determining costs for goods and services as a basis for billing customers.
2. More effective and flexible means for financing, budgeting, and accounting for operations.
3. Greater sense of responsibility and restraint in the ordering of goods and services based upon availability of funds.
4. More direct and rapid control of the quantity of support activities.

5. A more complete consumption-type budget and accounting structure by which costs of goods and services furnished may be budgeted and accounted for under the program or function for which they have an end use [Ref. 6, p. 206].

The financial size and diversity of the NIF as a whole represents a significant industrial complex. Total NIF revenues for fiscal year 1976 were approximately \$6.0 billion while total Navy net expenditures were approximately \$29 billion. In terms of diversification the NIF includes shipyards, printing stations, ordnance plants, aircraft overhaul and repair facilities, public works centers, RDT&E activities, Naval weapons facilities and ammunition depots, Polaris missile facilities, and the Military Sealift Command [Ref. 7, p. I-1].

1. Trends of RDT&E Laboratories

For the past several years there has been a trend toward reducing the total number of laboratories through consolidation. Laboratories in New London, Connecticut and Newport, Rhode Island were combined to form the Naval Underwater Systems Center (NUSC). In 1968, Naval Ordnance Test Station (NOTS), China Lake, absorbed the Fuse Laboratory, Corona, California, and emerged as the Naval Weapons Center. In 1975, the Naval Ordnance Laboratory, White Oak, Maryland, administratively combined with the Naval Weapons Laboratory, Dahlgren, Virginia and is now called the Naval Surface Warfare Center. This consolidation represents a 25% reduction

in the total number of laboratories which report to the Chief of Naval Material and a significant increase in the centralization of control.

There has been an apparent trend by the laboratories to increase the amount of work contracted out to private industry. This has been brought about by a desire to avoid competing with the private sector and because of increasing workloads without a corresponding increase in civilian personnel ceilings [Ref. 29]. As examples, in fiscal year 1976 direct contracts represented 30% of the Naval Weapons Center operating budget and 33.4% of the Naval Undersea Center operating budget. The customers of the NIF laboratories have historically paid the actual cost of direct contracts and will continue to do so in the future.

2. Operation of NIF at Laboratories

Navy Industrial Fund (NIF) accounting is a system of commercial accounting techniques adapted to the special requirements of the Federal government. NIF activities employ the double-entry bookkeeping methods and maintain a chart of accounts. The annual operating results are summarized in the conventional accounting format, a balance sheet, and an income statement. However, a NIF balance sheet cannot be interpreted in the same fashion as the balance sheet of a private firm. The most glaring difference is the absence of long-term capital assets on NIF balance sheets and the omission of depreciation expense on income statements. However, despite the deviations from private accounting, NIF

accounting has more of the aura and substance of commercial accounting than government activities funded on an allotment or operating budget basis.

A detailed description of NIF accounting is avoided in this thesis on the assumption that most readers are already familiar with industrial fund concepts. The functional review which follows is included as a prelude to discussions in subsequent chapters.

Functionally, an industrial fund can be explained in terms of the following aspects:

- a. Capitalization
- b. Funding
- c. Costs
- d. Overhead
- e. Sponsor Billing

a. Capitalization

Each chartered NIF activity is assigned a revolving fund or "corpus." Payment of operating expenses depletes the corpus. It is restored by billing government customers or sponsors on the basis of costs incurred. An activity corpus is really part of the aggregate NIF corpus. The size of the corpus depends on the pattern of outflows and inflows and operating profits or losses constitute net increases or decreases. However, just as a corporation may skim-off divisional profits and, if necessary, restore divisional losses, headquarters will adjust an activity's corpus as required.

b. Funding

NIF activities perform services and generate products for their customers or sponsors on the basis of reimbursable orders. These orders take the form of work requests or project orders depending upon which is appropriate. Work requests are used for normal recurring effort and expire at the end of the fiscal year. Project orders are used in project-oriented tasks and possess more flexibility to last beyond the end of the fiscal year. Work requests and project orders perform two important functions:

1. Authorize NIF activities to begin work with dollar limitation specified.
2. Provide a basis for sponsor billing.

In the area of funding, business practices yield to the imperatives of the appropriation cycle. Normally, the work is on-going; however, most appropriations are on a year-by-year basis. Therefore, much accounting effort is spent on the year-end hurdle of closing out one year's authorizations and establishing new ones. NIF accounting is characterized by a year-end climax to a much greater degree than is the case in private industry.

c. Costs

Direct costs are recorded under a job order identifying the customer. Costs are paid by debiting the corpus balance maintained in Washington. Whenever possible the payment function has been centralized at Naval Regional Finance Centers. NIF activities make only those types of

disbursements which the Navy has not found practical to centralize.

d. Overhead

In the area of overhead control, NIF activities most closely approximate private industry. In Navy laboratories, overhead, both indirect and GSA, is allocated on the basis of direct labor hours. Prior to stabilized rates, over or under absorption of overhead accounted for the net changes (profits or losses) to the corpus. The integrity of the corpus required good control of overhead rates. With the advent of stabilized rates, there are more ways to cause net changes to the corpus.

e. Sponsor Billing

When work authorized in a Project Order or Work Request has been accomplished, the NIF activity bills the sponsor. On the basis of this billing done on DD Form 1080, the Navy Finance office debits the NIF corpus and credits the sponsors. NIF laboratories bill for and receive progress payments. A project need not be complete to receive these payments; however, the costs must have been incurred. In billing, two rules must be followed or a criminal liability exists. The two possible statutory violations are as follows:

1. R.S. 3678 - Work must conform to the wording of the appropriation cited in the reimbursable order [Ref. 8].
2. R.S. 3679 - Billing may not exceed the authorized amount [Ref. 9].

If a NIF activity is performing a task for a sponsor and incurred costs exceed the authorized funding, it is a violation to bill the customer for the excessive incurred costs. The only legal, though highly undesirable way that the NIF activity can account for the overage is by charging it to overhead.

The heart of the laboratory planning process lies in forecasting the level of work and matching it with the resources available. At a program level, the laboratories compete with in-house and commercial competition to obtain as much work as possible. Business acquired at the program level is totaled to determine how closely projected business matches available resources at the aggregate level. The following questions are involved:

1. Size of total work force.
2. Availability of certain critical skills.
3. Availability of items requiring capital authorization such as laboratories and test equipment.
4. Appropriate sizing of support or overhead functions.

At a local level the budget cycle is basically a two year cycle--the planning phase and the execution phase. In the planning phase, the estimates of total business (funding) become more precise as the beginning of the execution year approaches.

Laboratory planning results in the publication of the Operating Budget and the A-11 Budget. The Operating Budget formalizes planning data in a manner most meaningful to the laboratories. It is regarded as an intra-Navy

document. The A-11 budget derives its name from OMB Circular A-11. It is based upon the same data as the Operating Budget. However, the line items are changed in certain exhibits to conform to OMB and Congressional formats.

Theoretically, laboratories could operate on a flexible budget system, sizing resources to fit business. Increasingly, however, a reverse situation prevails. Laboratories accept as much work as their personnel and plant permits. The Federal government sets personnel ceilings, and the building and equipment budgets. When projected work exceeds these limitations, the laboratories turn to contracting activity. When projected work drops off, contracting diminishes and fixed costs drive up overhead rates.

III. BACKGROUND OF RATE STABILIZATION: CORRESPONDENCE AND INTERVIEWS

A. INTRODUCTION

Initial guidance from the Assistant Secretary of Defense (Comptroller), ASD(C), indicated that rate stabilization at all DOD industrial fund activities would be implemented during fiscal year 1976 (FY 76) beginning 1 July 1975. This chapter will present a summary of the correspondence which flowed between the Navy Research and Development Laboratories, the Chief of Naval Material (CNM) and ASD(C). The results of interviews which were conducted at both R&D and non-R&D facilities on this subject are presented as the second part of this chapter.

B. ELEMENTS OF RATE STABILIZATION

The primary justification for rate stabilization has been to give customers of NIF activities a firm price for goods and services. The prices when established would not change during an entire fiscal year. By ASD(C) memo to the Assistant Secretary of the Navy (FM) dated 4 August 1975, the essential elements of rate stabilization were explained as follows:

.....Rate stabilization means that each activity will establish a set of fixed rates based on its approved budget. The rates will be used to bill all customers for the goods and services they receive from July 1, 1975, thru September 30, 1976. The rates may be expressed as costs per: manhour; manday; unit of output; unit of input; or any other manner which best suits the nature of the effort. An activity may have as many rates as is warranted by its organizational

structure and by its diversity of workload. The rates will encompass all overhead costs, labor acceleration, direct labor and direct materials...A waiver of the requirement to include direct materials in the rate structure may be requested if material usage is both unpredictable and not adaptable to the type of standard pricing techniques now employed by Defense stock funds...Fund activities which do not now have a rate structure should begin immediately to set-up such a system and to adjust their charges to customers accordingly. If conversion of ADP systems is a delaying factor, bills should be prepared by hand until the new ADP programs are put into operation. [Ref. 16]

An enclosure to the above memo waived the requirement to establish rates for direct material at research laboratories. However the laboratories were to be encouraged to set rates for direct materials whenever practical.

A letter from CNM to the Navy Laboratories dated 2 September 1975, told of discussions between ASN(R&D) and ASN(FM) which resulted in a request to OSD to exempt the NIF community from rate stabilization. The earliest date for implementation was extended by this letter to 1 October 1975 rather than 1 July 1975, and stabilized rates for direct labor were extended until the fourth quarter of FY 76 at the earliest. The NIF R&D activities were advised to review the rates currently being used to determine their validity for the balance of the fiscal year. The addressees were cautioned "not to build-in a margin of error since a large operating gain or loss, without adequate justification, will be viewed at higher levels as equally indicative of poor financial management." [Ref. 17]

1. Arguments Against Rate Stabilization

After the announcement by DOD that all industrially funded activities would establish fixed rates, the managers of the NIF R&D activities argued very strongly against the idea. The Navy's argument to have NIF R&D activities exempted from rate stabilization was that the work performed by NIF R&D laboratories was primarily one-time type of work performed almost exclusively in the past on a cost reimbursable basis, and virtually no fixed-price or repetitive work had been performed. Direct costs which were charged to projects and billed against the sponsor's funds were the actual costs of the work performed, whether the job required a GS-14 PhD effort or a GS-7 technician effort. Overhead rates were currently applied at an estimated fixed cost per direct labor hour with periodic insignificant adjustments to insure a break-even operation.

If standard rates were to be established and based on a cost center average, the projects requiring low cost talent would bear too much of the overhead load and the projects requiring high cost talent would not bear their fair share of the load. In neither case would the actual cost of the project be reflected in the billing process.

Prior to the concept of stabilized rates, planning and budgeting estimates for R&D projects were negotiated between the laboratories and the project sponsors with the scope of work (performance envelope and time frame) being agreed upon, rather than manning levels or composition of

work force. Variances which occurred were usually due to changes in the scope of work rather than changes in labor or overhead rates. The mechanisms for technical and financial feedback to the customer included: (1) monthly financial status reports to the customer on all research work performed; (2) regular technical reports to program managers; and (3) quarterly and semi-annual operating budget and financial statements to NAVCOMPT and activity managers that indicate all variances in budgeted overhead, G&A rates, and all costs. If there were significant cost increases on a project the customer was aware of this and had the option of providing additional funds or reducing the scope of the effort. A change to stabilized rates would end this smooth-running method of operation.

In addition to the other arguments, it was estimated that five or six months would be required to change existing computer programs and develop new programs which would be necessary for the new rate structure. There would be a considerable cost involved in establishing the rate structure and once in operation it would be a permanent additional cost, since the present cost control system was not to be discarded. The implementation of stabilized rates would permanently increase the general and administrative (G&A) overhead rates with no commensurate benefit derived for the managers of the R&D activities. [Ref. 17]

2. Response to Arguments

The arguments against rate stabilization were presented to ASD(C) during the months of August and September 1975. In

a memorandum to the Assistant Secretary of the Navy (FM), the Assistant Secretary of Defense(C) stated that he felt that the authority for final approval of within-year rate changes should remain within his office and that there was no basis for granting the R&D laboratories an exemption to the DOD policy. ASD(C) emphasized that rates would remain fixed throughout the year unless continuing losses threatened the viability of the fund as a whole. If unanticipated losses could not be absorbed by the fund, the full range of financial options would have to be reviewed before a decision could be made to change the rates. One option would be to transfer cash between revolving funds.

ASD(C) further explained that an exemption did not appear warranted because:

The nature of the lab effort does lend itself to rates based on manhours of effort without significant distortions of cost; financial management of the activities would be improved; industrially funded laboratories in the Army have neither sought nor been given an exemption; and the Navy's budget submission for FY 1977 already included \$98 million for rate stabilization in the Research and Development labs.
[Ref. 18]

Expanding upon the above points, ASD(C) stated:

The laboratories are not unlike many organizations within the industrial fund whose output is a service, not a product...It is recognized that Research and Development labs have a wide range of salaried employees, but our policy allows the flexibility needed to reduce these distortions to insignificant amounts. For instance, separate rates could be established for clerical, technical, and scientific manhours within a cost center or division...Stabilized rates will improve financial management by placing the long-range financial planning of the laboratories

on an equal footing with its customers. Another benefit is the ability to plan customer projects based on known rates rather than estimates... Finally, the budget request for the RDT&E Navy appropriation in FY 1977 contains \$98 million for the implementation of rate stabilization. The Navy cannot justify this amount unless the rates are actually fixed.

Therefore, it is in the best interests of the Department of Defense and the Navy to require the policy of rate stabilization to be implemented by the Research and Development labs. I would expect the implementation to begin no later than January 1976. [Ref. 18]

In response to the memorandum which denied exemption to the NIF R&D activities, the Office of the Assistant Secretary of the Navy (R&D) prepared a rebuttal paper which was largely a reiteration of the previously presented arguments against rate stabilization. A summary of the points are as follows:

1. The use of rates based on manhours of effort can lead to significant distortions of cost in the laboratories. In the case of material and contract services this has been recognized and waivers have already been granted...
2. No real benefit can be perceived from such a billing system over the use of actual labor costs which are readily available from the cost accounting system. There is no apparent reason to believe that financial management of the laboratories will be improved through the use of stabilized rates...
3. The \$98 million was included in the Navy budget as an add-on in accordance with OSD(C) guidance and may be deleted if exemption is made for the R&D NIF activities. I...again request that RDT&E NIF activities be exempted from implementation of rate stabilization. [Ref. 19]

3. The Final Decision

The Assistant Secretary of Defense (Comptroller) issued his final decision to deny exemption to the R&D

activities saying:

...As you know, the Senate Appropriation Committee has questioned the inclusion of some activities under the industrial fund umbrella. An exemption to R&D activities may raise the question as to whether or not the R&D activities should be included in the industrial fund. Our conclusion at this time is that they should and although we recognize that there may be some problems in implementation, they frankly do not, in our opinion warrant exclusion from this new policy. While the gains to R&D activities from this policy may not be as significant as with other activities, we have not discerned that there would be any disadvantages from their participation. Certainly, the R&D customers should benefit from this policy. I should emphasize that our policy does not contemplate changing the cost systems at any of the activities. It is only the billing to the customers that is affected....[Ref. 20]

Following the ASD(C) denial of exemption to the NIF R&D activities the Chief of Naval Material (CNM) issued directions to the CNM laboratories to prepare for rate stabilization. The laboratories were to stabilize all FY 76 overhead rates (General and Direct Cost Center Indirect) and the acceleration rate as of 1 January 1976. This letter also stated that the ASD(C) memo "requires the R&D NIF activities to implement the use of stabilized direct labor manday rates..." and that "NAVMAT will convene a laboratory workshop sometime in February to develop the approach which the labs will take in implementing this part of the Rate Stabilization Policy." [Ref. 21] The ASD(C) memo which the above letter referred to was carefully reviewed and no mention or reference was made to manday or other types of rate implementation methods, or procedures which should be used.

The meeting to discuss various aspects of rate stabilization was held in Washington, D. C., 11 and 12 February 1976. At this meeting it was pointed out that "...the stabilized direct labor rate for fiscal year 1978 must be established by August 1976 and could not be changed thereafter except by direct authorization from OSD. OSD has indicated that when these rates are stabilized in August 1976, (there is not to be) any allowance for inflation or pay raises between August 1976 and the fiscal year 1978 time frame that they address." The writer of the memo predicted that if the rates were set with "complete honesty and perfect foresight" the Navy laboratories as a whole, would be guaranteed to have operating losses of \$35-40 million dollars during fiscal year 1978 given current inflation and pay-raise increases. [Ref. 22]

The laboratories were to implement the direct labor stabilized rates as soon as possible, but most of the Comptrollers of the laboratories felt that the earliest date that full implementation could be achieved would be 1 October 1976. The time between the February meeting and the 1 October implementation date would be needed to determine how the stabilized rate structure could be most efficiently built into or added to the data processing and reporting system. The laboratories were directed to make a formal input to CNM indicating when, how, and how soon implementation of stabilized rates could be achieved.

A review of the correspondence in which the laboratories outlined their proposals for implementation indicated

that direct labor and overhead rates would be assigned at the cost center level. If distortions between actual costs and stabilized rate costs were too great at the cost center level then the rates would be assigned at a lower level within the cost center so affected. The laboratories intended to maintain their already developed system of accounting and reporting and add new accounts as necessary to accommodate the stabilized rate system with its associated variance accounts.

4. Budgeting for Inflation

The problem of not being able to budget for inflation and pay increases was officially protested in a letter sent from the Naval Weapons Center to the Chief of Naval Material. The protest read as follows:

The Naval Weapons Center would like to go on record as being opposed to the guidance...dealing with the policy of not budgeting for inflation. The present budgeting cycle is such that we will continually be two years behind in adjusting the direct labor rates for inflation. This translates to a deficiency of approximately \$9,000,000 in the Direct Labor Rate Variance Account of NWC by 30 September 1978 and will continue in subsequent years. It is felt that these losses will constitute a reflection on the management of the laboratories and will ultimately signal the demise of the Industrial Fund. [Ref. 23]

The Assistant Secretary of Defense (Comptroller) resolved the issue of not being able to budget for known or expected increases in labor and overhead costs by providing guidance which suggested that costs for Direct Labor could be increased by 5% for fiscal year 1977 and 8% for fiscal year 1978. The budget for overhead costs could be increased

8% for both fiscal year 1977 and fiscal year 1978. A further adjustment to the budgeted fiscal year 1978 rates was allowed to offset estimated gains or losses from fiscal years 1976 and 1977. [Ref. 24]

C. R&D LABORATORY INTERVIEWS

Interviews were conducted with individuals working in finance, budget, or comptroller offices at five Naval Material Command Research and Development Laboratories, to determine the local impact of stabilized rates. The implementation of stabilized rates was also discussed with personnel in two Public Works Centers and the Comptroller of the Military Sealift Command, Pacific. Interviews were scheduled by means of telephone calls and were conducted in the offices of the individuals being interviewed. The questions which were asked were written down by the interviewers prior to the talks and were of a general nature. The conversations at NUC, NELC, NWC, MSCPAC, and the PWC's were tape recorded. The interviews were generally forty-five minutes to one hour in length. All of the people being interviewed were open and willing to answer any questions pertinent to the subject area. The atmosphere was generally informal and friendly.

Interviews in the Washington, D. C. area were conducted by Mr. Solberg. Interviews in the San Diego area were conducted by Lieutenant Commander Kramar. Interviews at NWC, China Lake and the Oakland area were conducted jointly by the writers.

1. General Discussion

The attitudes of the individuals being interviewed toward the concept of rate stabilization were generally negative. The major reasons for opposing the concept are substantially the same as those pointed out earlier in this chapter, and are summarized as follows. 1. The very nature of research work is such that a product is not guaranteed for a fixed number of dollars, rather a fixed number of dollars is allocated to a project and the project is worked on until the money is spent or the research is complete. A stabilized rate for direct labor, labor acceleration, and overhead will not change the nature of the work being performed. 2. Only DOD sponsored projects would be billed at the stabilized rates. All other sponsors would still be required to pay actual costs for work performed. 3. This difference in costing projects necessitates maintaining the old system of collecting actual costs for billing non-DOD customers, and adding accounts as necessary to establish a stabilized rate billing system for all DOD customers. 4. Variance accounts would have to be established to keep track of the differences between the billed costs and the actual costs of the projects.

At the time of the interviews the laboratories had not yet started the actual reprogramming effort which would be required to implement the new billing system. Personnel at all of the installations felt that the reprogramming effort would be complete by the 1 October 1976 deadline. The cost of implementing the new system was estimated by the various laboratories as follows:

NUC - \$15,000 [Ref. 30]
NELC - \$100,000 [Ref. 29]
NWC - \$70,000 [Ref. 31]
NSRDC - "Not too much" [Ref. 32]
NSWC - "Don't really know, but not critical" [Ref. 33]

The estimates that were projected were acknowledged to be only "rough guesses" and the actual cost of implementation could not be determined until reprogramming and debugging were completed. NUC and NELC indicated that contract programmers would be used and that their labor was the item most easily measured in terms of cost. The measurable costs of maintaining the system after implementation were not expected to increase significantly. The implementation of the stabilized rate system is feasible from a computer programmer's standpoint.

2. Impact on Laboratory Management

The area which appears to provide the most dissatisfaction, with regard to stabilized rates, is that of management flexibility. The objectives of the Industrial Fund activities are described in DOD Directive 7410.4, (September 25, 1972). According to this directive the Industrial Funds are designed to "Provide to managers of industrial and commercial-type activities the financial authority and flexibility required to procure and use manpower, materials and other resources effectively." (Paragraph V.A.3) In addition this directive states that a specific objective is "To establish and use realistic cost standards as targets rather than detailed

cost limitations." (Paragraph 5.B.6) The directive generally emphasizes the requirement that local managers have the authority and responsibility for the overall operations of the local activity. During the interviews one individual stated that the "value of NIF is that management has responsibility for overall operation... stabilized rates take away one area of flexibility that management should retain." [Ref. 29]

In the past, local management had the authority to periodically change the rate at which overhead was charged to the laboratory customers. These rate changes were generally minor and were done to insure a zero gain or loss in the corpus of the fund. Direct labor and overhead at Naval Weapons Center represents 52% of a total budget of approximately \$206 million (FY 76) or \$107 million. Since the NWC corpus is two million dollars, an error of less than two percent in forecasting direct labor and overhead costs for a budget year which will end two years in the future could double or eliminate the working capital of the activity. While the operating results of a single activity may not affect the Industrial Fund as a whole, the manager of NWC has expressed the fear that potential losses "...will constitute a reflection on the management of the laboratories..." [Ref. 21]

The Commander of the Naval Weapons Center stated in a presentation to the Assistant Secretary of the Navy (Financial Management): "My view is that Fiscal Integrity and Fiscal Accountability must be imposed uniformly on all Laboratory Commanders. BUT they must be allowed FISCAL FLEXIBILITY to

to make the best possible decisions to accomplish their assigned missions." [Ref. 42] The individuals interviewed at the various Research and Development activities expressed similar views.

3. Long Run Survival

The individuals interviewed did not feel that the nature of the work performed at the R&D laboratories would change significantly or that the laboratories themselves would eventually cease to exist. It was however pointed out that the Navy Industrial Fund is an accounting system which could be compared with appropriation accounting or the Resources Management System (RMS). The managers at the NIF activities feel that the NIF system is the best one to use in the laboratories and that the system will continue to survive even with stabilized rates.

4. Planning

The areas of planning and budgeting with the inclusion of stabilized rates appeared to present the most concern. The experience of rapidly increasing costs during the past several years has increased the difficulty of accurately projecting or predicting the cost of operations up to two years in advance.

The Naval Undersea Center (NUC) provides an example of the difficulties with rate stabilization. The rates which NUC will use for FY 77 are based on the A-11 budget which was submitted one year ago. NUC has recently been notified that utility costs for FY 77 will increase from \$.9 million to \$1.5 million. The utility costs for FY 77 will nearly double due to a general increase in utility rates which the Public

Works Center (PWC) San Diego, was not allowed to pass on since it was required to stabilize rates in FY 76. The activity may be able to absorb the increased utility costs, but if all other factors were predicted with exact precision, the activity could realize a \$700 thousand operating loss from the increased utility costs alone. [Ref. 34]

Another factor which complicates the budgeting process is that many of the projects which are worked on at the laboratories are subject to annual Congressional appropriations. The Congressional appropriations process does not occur until after the budgets of the activities have been submitted. The projection of the number and size of projects at any given activity has a significant impact on predicted budgets and rates.

5. Corpus

Historically, the activities have budgeted to maintain a zero gain or loss in the local NIF corpus. During the course of a year, small adjustments in overhead rates might be made to maintain the corpus at a zero gain or loss. Those interviewed generally agreed that over a period of years the corpus could be maintained since operating gains or losses in one year will be used as an adjustment factor for the following years. It was pointed out however, that significant underabsorption of costs could present cash flow problems because the corpus at most of the activities is about one percent of the total operating budget. [Ref. 29] According to the correspondence reviewed, the activities can request

OSD approval for a transfer of funds to maintain a favorable cash balance in the local corpus. One individual commented, "The feeling at the DOD level seems to be, if the corpus as a whole is O.K., then the individual field activities don't have to worry." [Ref. 31]

6. Legal Implications

The legality of implementing a system which could result in corpus losses with the intent of recovering losses in a succeeding fiscal year was questioned by some of the local activity managers. Title 31 United States Code, paragraph 628, Revised Statute 3678 reads, "Except as otherwise provided by law, sums appropriated for the various branches of expenditure in the public service shall be applied solely to the objects for which they are respectfully made, and for no others." [Ref. 8] It might appear that a possible violation could be incurred because large prior-year losses would be recovered using appropriations intended for current-year work. The Assistant Secretary of the Navy (Financial Management) answered this by saying:

The provisions of R.S. 3678 relate to the application of appropriated funds to the purposes for which they were made. To the extent that customers use their funds for the purposes authorized, e.g., air frame repair, the statute would not be violated, notwithstanding the fact that costs charged to the customers by the industrial activity include a factor considered necessary to compensate for prior years' losses. [Ref. 25]

There has also been concern that the provisions of Title 31 United States Code, Section 665 (R.S. 3679) would be violated. This statute reads in part:

No officer or employee of the United States shall make or authorize an expenditure from or create or authorize an obligation under any appropriation or fund in excess of the amount available therein; nor shall any such officer or employee involve the Government in any contract or other obligation for the payment of money for any purpose, in advance of appropriations made for such purpose, unless such contract or obligation is authorized by law ... Except as otherwise provided in this section, all appropriations or funds available for obligation for a definite period of time shall be so apportioned as to prevent obligation or expenditure thereof in a manner which would indicate a necessity for deficiency or supplemental appropriations for such period... [Ref. 9]

With regard to R.S. 3679, ASD(C) has implied that a violation would not be incurred as long as the industrial fund as a whole did not go broke. Mr. Miller of NUC explained that R.S. 3679, "applies only to the extent that a funding document for \$10,000 cannot be billed \$11,000...Running the corpus out of money is not a 3679 violation but is strongly frowned upon..." [Ref. 30]

7. Stabilized Rates as a Planning Aid

As a planning aid the stabilized rate policy is of most use to the customers of the activities since they will know in advance how many hours of effort their dollars will buy. In the research area however, it may not be known how many hours of effort will be required to achieve a solution to a research problem. The Comptroller of NELC explains, "There is still no way to give an absolute dollar cost to a particular development project. An estimate can be made, but if more labor hours are required than were estimated, either work stops or more money is made available." [Ref. 29]

There was a consensus that the NIF process will not change and that R&D activities will still attempt to budget for a zero gain or loss, but for a three-year horizon. The difference now is that the activities will be required to bill their customers at the published rates.

8. Stabilized Rates as a Cost Distorting Factor

The individuals interviewed indicated that stabilized rates as a cost distorting factor will be significant only to programs which are small in terms of total manhours. The larger projects utilize a wide enough range of talent that cost center average costs closely approximate the actual cost of the work done. A problem does exist if the projected average costs for labor or overhead are significantly over or under estimated. This would cause next years projects to cost more (or less) because this years projects absorbed too little (or too much) cost.

D. INTERVIEWS AT NON-R&D NIF ACTIVITIES

Interviews were conducted at the Public Works Center, San Diego, (PWCS D), Public Works Center, San Francisco Bay, (PWCS F), and the Military Sealift Command, Pacific, (MSCPAC) to provide some information on activities with experience using stabilized rates. The individuals interviewed were the Assistant Division Director for Accounting at PWCS D, the Comptroller at PWCS F, and the Comptroller at MSCPAC.

1. Public Works Centers

The Public Works Centers were required to implement rate stabilization during fiscal Year 1976. Labor was charged

at actual cost for the first seven months of the fiscal year, and stabilized rates became effective 1 February 1976. Overhead rates were frozen for all of fiscal year 1976.

The cost of implementation was estimated to be not more than \$10,000 at PWCSO [Ref. 35] PWCSF estimated the cost of implementation to be \$100,000. [Ref. 36] These were estimates for the cost of programming changes for the automatic data processing system.

Both activities experienced losses on direct labor after the rate was stabilized. PWCSO lost \$100,000 for the remainder of the fiscal year and PWCSF experienced a loss of \$30,000 per month. The major problem for both activities has been the rapidly increasing cost of utilities. The interviewee at PWCSO explained that "the Public Utilities Commission is very political which makes it hard to anticipate what will happen. We used to be able to figure increases in utility rates would be consistent with increases in wage rates and fuel costs. This is not so anymore, the rate structure changed so that rates for commercial users increased significantly and homeowners rates were not appreciably affected. A 19% system increase was a 40% PWC increase." [Ref. 35] The 40% increase in utility costs which PWCSO experienced led to a need for a corpus augmentation of \$2.5 million. The corpus augmentation was not a shift of funds between activities but rather a loan which has to be repaid out of next years earnings. [Ref. 35]

The individuals interviewed at both activities felt that the concept of rate stabilization was one which could be lived with. Predicting utility changes was the one area that both agreed would present the most problems.

a. Impact on Corpus

With regard to the expected impact on the corpus of the activities the long run results will even out gains and losses. While PWCSF was the first Public Works Center to project significant losses the PWCSF interviewee stated, "Even though PWCSF is more in the red than other activities, we are also closer to breaking even than other activities. The crunch will come in two or three years because forecasting is very difficult. Since there is a two year lag in recovering underabsorbed costs, this may cause a whiplash effect on the rates which will be charged." [Ref. 35] While PWCSF required the corpus augmentation, PWCSF reported operating gains of \$630,000. Part of the gain was offset by prior year losses of \$260,000. [Ref. 36] Public Works Centers have been exempted from the requirement to use stabilized rates for material.

b. Cost Controls

At PWCSF each department is responsible for planning its own budget. The targeted budget and actual costs are reviewed quarterly. The variances which occur are reviewed only at the higher levels of management. Management pressures are applied to stay within budgeted costs. The objective is to break even or be within one percent of the total budget. Costs are collected at actual cost then converted to stabilized

rates which are used to bill the customers on a bi-monthly basis. Variances are collected on a job order or customer order basis and then aggregated to show the total labor or overhead variance. [Ref. 36]

PWCSD was using rates which were set at the lowest level within each cost center. This resulted in the use of approximately one hundred different rates for direct labor. Fewer rates would be more appropriate and PWCSD will probably start a policy of setting rates according to the basic trades (carpenters, metal workers, etc.). PWCSD accumulates variances for each predetermined rate and aggregates those variances into one account for a total direct labor variance. The customer billing process has remained the same except that the rates on the bills are now stabilized rates. [Ref. 35]

Neither of the Public Works Centers appear to utilize the accumulated variances for cost control at the lower levels of management. They appear to be collected primarily for statistical and reporting purposes.

c. Impact on Customer Planning

The major benefit of utilizing stabilized rates is that the customers of the Public Works Centers will be able to accurately budget maintenance, upkeep, and utility costs. Both of the individuals interviewed felt that the customers were happy with the policy of fixed rates. As was pointed out, "Instead of having fifty different San Diego activities asking for budget variances, it's better to have one activity asking for a variance. From the customer point

of view it's very attractive." [Ref. 35] Since in-year rate changes have been eliminated, the long run accounting work for both the users and providers of services might be reduced. [Ref. 36]

d. Advice to Activities Implementing Stabilized Rates

If an activity is switching to a stabilized rate system the major emphasis should be placed on having an accurate cost data base. Implementation was considered to be no problem if the financial system is up to date and the data is accurate. [Ref. 36] One interviewee stated, "Good cost data is necessary...if fluctuations can be traced, then rates can be better controlled or predicted." [Ref. 37]

2. Military Sealift Command

The Military Sealift Command has had more experience with rate stabilization than any of the other activities where interviews were conducted. MSCPAC operates as a division of the Military Sealift Command (MSC). The operating results which are depicted in Appendix C are for the MSC as a whole and not of MSCPAC. It should be noted that, except for the last three years, MSC has generally come to within 2-1/2% of the budget predictions. [Ref. 37] MSC implemented stabilized rates in fiscal year 1974. After implementation, MSC operating results showed a loss of \$78 million in FY 74, which was offset by a gain of \$86 million in FY 75 through rate adjustment. These fluctuations were primarily due to unanticipated fuel price increases. Fluctuations have continued to be high since FY 75.

The cash allocation (corpus) of MSC is \$100 million and operating revenues for FY 76 were programmed to be approximately one billion dollars. [Ref. 26] It should be noted that the MSC corpus represents approximately ten percent of the operating budget while the corpus of the R&D activities represents approximately one percent of the operating budget.

a. Operating Environment

Due to the nature of its operation, MSC is significantly affected by world economic conditions. Fuel prices and the cost of repairs in foreign ports are generally higher than they might be if the ships were operated and repaired from a single facility. If a ship is damaged in a foreign port the repair costs may be three times as much as would be expected if the repairs could be made in the home ports. MSC is the only area in civil service which allows people to be paid more than civil service ceilings. The civilian captains' starting salaries are approximately \$62 thousand per year working six months on duty and six months off duty. [Ref. 37]

Commander Leals of the MSC emphasized the importance of cost controls several times with particular emphasis placed on being able to trace costs.

b. Comments on Stabilized Rates

Commander Leals had a positive attitude toward the concept of stabilized rates saying, "Stabilized rates are the only way to go. Our operations don't cease on 30 June and we need the longer term planning horizon of three to five years. We do need to be accountable for a specific

period of time as a measuring device and the fiscal year is a good measuring device, but the business is an ongoing business and a longer term is needed for planning." [Ref. 37] He also commented that fixed rates make budgeting much easier for the users of the industrial fund activities. As a general comment Commander Leals stated:

"You have to sell the higher echelons... on the fact that revenue fluctuations of a severe magnitude may occur depending on the world economic situation... You need to have people at the Secretarial and Congressional levels understand what the implications of fixed rates are... you have to be able to justify why a gain or loss has occurred, but the mere fact of a great gain or loss is not of concern as long as there is sufficient justification for it." [Ref. 37]

IV. ANALYSIS

A. INTRODUCTION

Chapter IV addresses the questions of causal factors leading to stabilized rates in the Naval R&D laboratories and the logical consequences of such a policy on management. This chapter first examines the linkage of casual factors behind the thrust of fixed rates. Secondly it looks at the consequences of the policy in terms of (1) impact upon the laboratory management process, (2) impact upon the accounting process and (3) impact upon the external, i.e., the customer structure. The forward-looking portion of Chapter IV is based upon assumptions concerning unresolved details in the application of stabilized rates and what constitutes rational responses by key actors in the organizational systems. Both technical accounting analyses and organizational theory are generally avoided. The focus of this chapter is the interface and the reciprocal impact between accounting systems and the management process.

B. CASUAL FACTORS LEADING TO STABILIZED RATES

From a short-term, practical standpoint, a discussion of casual factors is academic. The Navy Laboratories have been directed to proceed forthwith in instituting stabilized rates. To the extent adoption of the policy is a settled issue, coping strategies become more important than policy evaluation, at least at the level of laboratory management.

From the standpoint of this thesis, however, the reasons behind the policy change become important.

Stabilized rates were not imposed on Navy Laboratories because of factors peculiar to the laboratories themselves. It appears rather that the policy was justified as a more "macro" level, treating all NIF activities as a single class. Through the invocation of procedural uniformity, adoption of stabilized rates was required of all NIF activities including Navy Laboratories. The two stage effect -- justifying fixed rates for all NIF activities and then forcing fixed rates to fit the R&D situation -- is the overview best explaining the presence of fixed rates at the laboratories today.

Among the interviewees, there was a high degree of consensus as to the casual factors perceived to underlie stabilized rates at industrially funded activities. The respondents also believed that the policy was an outgrowth of interaction between DOD, OMB, and Congress. The two reasons most frequently cited in the laboratory interviews for the impetus to stabilize rates were:

1. To make it possible for operational users of industrially-funded activities to execute plans in the face of spiraling inflation.
2. To encourage better management at industrially-funded activities.

Comments transmitted under the signature of Mr. G. D. Penisten, Assistant Secretary of the Navy (Financial Management) tend to confirm this assessment. The following are excerpts from these comments:

1. What is the main purpose of rate stabilization?
The main purpose of rate stabilization is to execute the budgeted program and to eliminate perturbations in the budgeted program. ... A concomitant objective of rate stabilization is to improve customer planning which, in turn, should improve work scheduling at NIF activities. The resultant stability in workload and workforce should permit increased economies and efficiencies to be realized at NIF activities. [Ref. 25]

The two purposes are not mutually exclusive. It is possible that a policy change could be beneficial to the customer and also contribute to better internal management. All evidence indicates that stabilized rates were instituted mainly for the industrial fund user.

Navy customers of industrially-funded activities are, in fact, living with a budgetary crisis. Navy operational commands have had to live with the problem of acute budget shortfalls because of sharper than expected price increases. This has been particularly true in O&MN (Operations and Maintenance, Navy) Appropriations. These operational commands are major customers at NIF activities in a user-producer relationship. Classes of NIF activities which are used include shipyards, public works center, air rework activities, and research and development centers. Inflationary pressures, particularly during the years 1971, 1972, and 1973 resulted in frequent steep rate increases in prices NIF activities charged their customers. The users had the painful choice of seeking budget augmentation or settling for reductions in work accomplished. All too often it was the latter. Intervals between overhauls were lengthened. Repair work was cut back.

Minimum standards were temporarily abandoned. An alarming "bow wave" of unmet maintenance needs was created. The following example illustrates the Navy's problem:

Example: In the past, the Operation and Maintenance, Navy appropriation could budget for 95 ship overhauls based on a planned number of man-days for each individual ship at a specific shipyard, using that yard's current man-day rate. This would generate a total budget of say \$900 million. No cost escalation was allowed to be added to the O&M,N budget. Therefore, when the ships actually came into the yards (about 1 to 1-1/2 years after the budget formulation), the O&M,N customer found the yards charging higher man-day rates because of actual experience for costs of labor, material, utilities, etc., and instead of getting 95 overhauls for the \$900M, the Fleet could only overhaul 85 ships. This tended to push an increasingly large bow-wave of required overhauls into the future and degrade the readiness of the Fleet. [Ref. 25]

An obvious approach to the problem would be to add contingency or "Fudge" factors to the various operational budgets based upon forecasted inflation rates. Budgets would be more realistic in terms of resources available. Budget execution would more closely track budget planning. Indeed provisions for inflation are currently included in some budget line items. Most procurement appropriation budgets contain provisions for general civil service increases of 5% since the Federal Pay Bill of 1972 prescribed the timing and basis for general schedule wage increases. Shipbuilding contracts, which are multiyear, incorporate provisions to allow some relief from inflation. Generally, however, the portion of O&M,N budgets for work to be performed by NIF commands has been inadequate in anticipating price increases since pay raises and inflation

were not permitted to be included prior to the FY 78 budget submission.

The Office of Management and Budget has been reluctant to allow operational commands to budget for forecasted rate increases in the part of the budget earmarked for industrial type work. Potential reasons for this reluctance include the following:

1. It is politically awkward for an administration to acknowledge expectations of high inflation in its planning at the same time it is supposedly pursuing policies to reduce the inflation rate.
2. Allowing a factor for inflation opens another potential for padding. This could work at cross-purposes to the present climate for tightening-down on budget abuses.
3. Allowing a factor for inflation, if not properly controlled, could result in double budgeting. This would happen when planners at two or more echelons each add an inflation factor.

Out of reluctance to give more ground in the direction of adding inflation contingencies to O&M,N budgets, other alternatives were sought.

One emergent alternative was therefore to implement a pricing policy of fixed rates by government industrial type activities. DOD operational users could then draw up a plan based upon known rates. A high rate of inflation will still reduce what can be accomplished. However this scale-down

would be reflected in the plan. Once the plan was approved, performance should track very closely. Stabilized rates would help operational units plan and, at the same time, deprive them of one excuse for bad planning.

With stabilized rates the problem of uncertainty in inflation rates is still present but now the location has shifted. The problem is transferred to industrially funded activities. Errors in estimation become profits or losses to the industrial fund. In a worst-case situation, one of the service industrial funds would be exhausted. The worst case has potential legal implications and, it should be emphasized, need not happen.

It can be argued that the problem of inflation rate uncertainty is better placed at industrially-funded activities. Industrially funded activities have two inherent restraining devices missing in other government environments. First, errors in estimation will reflect themselves as profits or losses to the fund. This is not infallible inasmuch as a profit or loss is the net of all factors. Other factors could mask error in inflation forecasting. Profit due to overestimating inflation could offset some other operating result so that a large plus and a large minus net out to a small change. Nonetheless, profits and losses are still variances susceptible to analysis. The second restraining factor is that industrial type activities are susceptible to price analysis. Published prices can be compared, in many cases, to prices quoted by counterparts within the private sector. There may be elements of non-comparability but again

comparison of prices offers a ready-made variance. Changes to the fund and price analysis both offer (1) a source of visibility facilitating oversight and (2) a potential market place discipline tending to promote cost-consciousness. It may be questionable how effectively these mechanisms do the job but they are at least present in contrast to facilities funded by allotment.

Assuming that a policy of stabilized rates is desirable for most classes of industrial activities, should it be uniformly applied to all activities? As chronicled in Chapter III, the Navy Laboratories responded rigorously in the negative. Nevertheless, the policy was uniformly required of all NIF activities including R&D.

Navy Laboratories are, because of the nature of research, basically different from most industrially-funded government activities. The output of a public works center, for example, is a tangible product or service. Typically the processes are highly standardized. Production costs can be accurately determined by individual engineers and cost accountants. Often the product is commercially available providing yet another indication of a proper price. In contrast, the product of a research and development center is unpredictable and non-standard.

Federal laboratory programs differ not only in their particular distribution of activities -- ranging from basic research to specific product development -- but also in the disciplinary mixture of their scientific talent. This multiplicity of kinds of scientific efforts makes it difficult to define performance or output even for one particular organization.

Another aspect of Federal laboratory research that challenges adequate definition is the identity of either the immediate or long-term beneficiaries or users of an agency's R&D output. In contrast to industrial R&D which is performed for purposes of profit with readily identifiable users, Federal R&D is intentionally oriented toward tasks that the private sector cannot or will not undertake, as well as tasks appropriate to government undertaking in the national interest. [Ref. IO, pp. i, ii]

Navy laboratories do have users in the sense that their NIF sponsors, primarily the Naval Systems Commands, are end users. The general problems of measuring laboratory output are present in Navy laboratories.

In this situation, costs become surrogate measures for output. Customers pay laboratories for a "best effort" rather than a product. In this vein laboratories argued that fixing the price of inputs, i.e., labor, was a meaningless drill since the chief source of uncertainty was the quantity of input, not the price. The laboratories further argued that in actual practice, a customer would fund a laboratory to a certain level and the laboratory would continue effort on the customer's project until funds were exhausted. Therefore, stabilized rates merely represented another overhead increasing exercise.

Nevertheless, requests by the Navy Laboratories for waivers from the policy were rejected. In refusing to exempt the laboratories, DOD did not make a persuasive case for stabilized rates at Navy Laboratories in particular. The gist of the rejoinder was that stabilized rates were a general policy and the laboratories did not have a strong case for exemption. This attitude is in a passage of a memo on the

subject of rate stabilization from DOD to the Navy. The memo reads, "While the gains to R&D activities from this policy may not be as significant as with other activities, we have not discerned that there would be any disadvantages from their participation." [Ref. 20]

The entire stream of administrative correspondence stresses the need for uniform implementation of stabilized rates. There is a hint that if stabilized rates are not suitable for a class of activities, industrial fund accounting is not suitable either as indicated by DOD in the following comment: "As you know, the Senate Appropriations Committee has questioned the inclusion of some activities under the industrial fund umbrella. An exception to R&D activities may raise the question as to whether or not the R&D activities should be included in the industrial fund. Our conclusion at this time that they should and although we recognize that there may be some problems in implementation, they do not, in our opinion, warrant exclusion from this new policy." [Ref. 20] As stabilized rates evolved, the laboratories were impaled upon a neat dilemma. Stabilized rates and NIF accounting became a package deal.

More fundamentally, insistence upon uniform implementation coincides with a general trend to standardize and centralize. Concurrent with stabilized rates, for example, the Navy is actively pursuing a standardized, and more centralized, civilian payroll system. Property management has been centralized. Personnel administration has experienced increased centralization. Whatever arguments are used to

support changing to stabilized rates, the new policy is another manifestation of the trend to standardize and centralize.

C. IMPLEMENTATION CONSIDERATIONS

This section on implementation considerations deals with the short-term strategies and problems associated with putting stabilized rates into operation. Whatever the reasons or the effects, the new policy is now mandatory. The die has been cast. Laboratory personnel have to shift into an execution mode and make the required changes.

The eight NAVMAT laboratories officially began billing using stabilized rates on October 1, 1976, the beginning of fiscal year 1977. This thesis effort spans the start-up period and permits comparison between anticipatory fears and actual experience during the first three months. Initial feedback indicates that the conversion has been relatively smooth. The worst fears remain, to date, unrealized. This tends to bear out the responses of laboratory interviews which rated implementation problems to be of less concern than the long range impact which stabilized rates would have upon laboratory management. The apparent lack of difficulty should not lead one to unduly minimize the task of changing internal systems to a stabilized rate basis. Over the last few years the laboratories have become experienced in adapting their financial systems to externally-mandated changes. Experience in system-changing undoubtedly made this last change easier. Secondly, problems may have not yet surfaced.

The work of implementation can be logically segregated into two kinds of activity. The first is the budget or planning task of initially setting the rates. The second is the specialized task of changing computer programs and accounting procedures. The two areas require different skills and are oriented in different directions. However, close coordination is required between the budget activity of rate-setting and the systems analysis task of modifying an automated financial system. In recognition of this need all five laboratories interviewed had established ad hoc task groups possessing inter-disciplinary skills to oversee the change. Despite initial opposition to stabilized rates, each of the laboratories visited appeared to be mobilizing their financial skills to make stabilized rates work.

Discussions and preliminary analysis of rate-setting methodology had been going on since the Navy laboratories first received an inkling of the high probability that R&D activities would not receive a waiver from the stabilized rate requirement. Considerable uncertainty existed as to how many rates a laboratory could have, what the basis for different rates would be and what provision, if any, could be made for inflation. By mid-1975, many of the uncertainties had been resolved. Most of the methodology is contained in paragraph 3 of NAVMATNOTE 7600 [Ref. 27], which restates the basic NAVCOMPT Instruction for the NAVMAT laboratories.

3. Policy

a. Each activity operating under the provisions of reference (a) will establish rates which may be expressed as costs per manhour, manday, or unit of output. An activity may have as many rates as

approved in advance by the activity's group manager. Rates will be in consonance with the budgeting and accounting practices and procedures as presented in reference (a). Each approved composite rate will encompass all overhead costs, labor acceleration and direct labor. Rates will not cover direct material, direct travel, nor direct contractual services. In order to minimize profits or losses in the Navy Industrial Fund corpus, billing rates will be proposed in the annual NIF A-11 budgets submitted to OSD based on the premise that all anticipated costs in the budget year will be recovered by the proposed rates. Upon approval by OSD, rates established in compliance with this notice are expected to remain in effect throughout the budget fiscal year. Therefore, activities will change neither individual component nor composite rates without higher authority approval. Requests for rate changes shall be submitted via chain of command with appropriate justification. OSD has indicated that rate changes will be approved only when continuing losses threaten the viability of the Defense Industrial Fund as a whole.

b. Approved rates will be used in providing federal sponsors with budgetary estimates for work to be performed.

c. Approved rates will be used to bill all DOD customers (sponsors) for work performed and services rendered on the basis of accepted cost reimbursement orders with the exception of reimbursable orders citing programs that are not subject to normal overhead distributions, e.g., Family Housing. Exempted reimbursable orders will be billed in accordance with current procedures.

d. Approved fiscal year rates will be used to bill all DOD customers for work or services performed within that fiscal year regardless of when billed.

e. Work performed and services rendered on the basis of accepted fixed price orders will be billed the fixed price amount in accordance with procedures in reference (a). However, the amount of fixed price orders will be negotiated on the basis of the rates established in compliance with subparagraph 3.a. above.

f. Work performed and services rendered for non-DOD customers of industrially funded activities are not included under the subject program. These customers will, therefore, continue to be billed for actual costs incurred in accordance with current procedures.

g. Approved rates will be used to bill direct costs to all DOD customers (users) for work performed or services rendered by industrially-funded Test and

Evaluation activities operating under the DOD uniform funding policy for Major Ranges and Test Facilities. Non-DOD customers will be billed actual costs in accordance with current procedures. Indirect cost (overhead) will continue to be charged to institutional support, RDT&E category 6.5, and will be based on accrued costs incurred, not on approved rates.

Prior to mid-1976 two out of the three components of stabilized rates were in effect already set. The laboratories had been directed to freeze G&A and indirect overhead in mid-FY 1976 in response to headquarters guidance. Another component, acceleration for payroll benefits, was relatively stable. What remained to be done was to determine the number of direct labor rates each laboratory would use and the setting of each direct labor rate.

The laboratories interviewed all believed that it was highly important to set an appropriate rate initially. An appropriate rate would be defined, in this context, as one in which changes to the corpus are small, i.e., minimal profits or losses. This arises from the belief that the laboratories would not enjoy as much local discretion in future rate setting as was enjoyed the first time around. The basis for this concern is the concept of the group manager. The basic NAVCOMPT Instruction [Ref. 11], establishes group managers for clusters of NIF activities. The group manager administers the aggregate of the industrial funds under his cognizance. The effect of this aggregation will be to net out performance extremes within the manager's group of activities. A loss at one activity may offset a profit at another. The fear was expressed that rate-setting would

be increasingly driven by aggregate trends. Industrial activities would operate with partially-imposed rates not properly reflecting local costs. The laboratories wanted to make sure that rates were realistically set while the action was still largely in their hands.

The second major implementation task is that of modifying the financial systems - both the automated and manual portions - to accommodate the new policy. Since financial systems at the NAVMAT laboratories are highly computerized, much of the task involves computer systems analysts and computer programmers. The quality of the implementation is dependent upon how well the changes to be made are defined in advance. Specific details of the changes are wedded to the ongoing financial data processing systems operational at each of the laboratories.

At the time of the interviews, the inevitability of stabilized rates had been accepted. The laboratories were concentrating on systems definition. There was a high level of confidence that the change to stabilized rates would be smoothly accommodated.

D. IMPACT UPON LABORATORY MANAGEMENT

Some uncertainty surrounds the operation of the new policy, because some results of stabilized or fixed rates depend upon how the rates will be administered. Since the new policy has just become operative, there is no data regarding the administration of rates, especially by group managers. Nevertheless, it is considered that stabilized rates will have five major

effects upon the laboratory community:

1. Modification of the planning process by quantum increases in planning lead time and in the minimum degree of planning precision required.
2. Changes in funding practices by customers.
3. Increases in the degree of vulnerability to upheavals in the economy.
4. Transfer of some control from the laboratories to headquarters.
5. Increased conservatism by laboratory management.

1. Modification of Planning Process

Laboratories are finding that both lead time and precision required in formulating performing budgets are increased. The laboratories submit rates to the group manager via the A-11 budget just prior to the fiscal year. However, as a practical matter these rates will already have been the subject of a negotiation process several months in advance. It is also necessary to communicate the rates to customers in advance. To arrive at rates earlier, the base data used in calculating has to be estimated earlier. Respondents in the laboratory interviews felt that planning lead time would be extended by as much as one year. A corresponding increase in the precision of budgeting is required. Historically, laboratories have formulated rough, long-lead performing budgets. These budgets were refined in iterative stages as data firmed-up, resulting in the publication of a fairly accurate document just prior to the execution phase, i.e., just prior to the new fiscal year.

Longer lead time coupled with high precision requirements will have both positive and negative side effects. The laboratories will have to do more genuine planning to develop rates as accurately as possible. Better planning is certainly a positive spill-off. On the other hand, once made, there could be a tendency for rates to become self-fulfilling objectives. In the worst-case situation, gaming of the system could occur. There is a greater likelihood that management will transact its business with one eye on how the rates are working out. This syndrome need not be overt or conscious. To the extent that preoccupation with breaking-even detracts from pursuit of basic goals, this has to be considered a negative side-effect.

2. Changes in Funding Practices

Actual funding practices by principal laboratory sponsors may not be compatible with the long-lead fixed rates. This issue is raised in a position paper written at one of the large Naval Laboratories..

....In spite of our best planning efforts, the budgets for individual projects fluctuate throughout the budget and even the current fiscal years. Often we do not know the final funding picture until late in the fiscal year. [Ref. 43]

The paper then notes that laboratories tend to receive sponsor funding at the last minute and adds:

In many cases individual projects are working on a hand-to-mouth basis. Long range planning and rate stabilization become difficult under these circumstances.

RDT&E is a dynamic program, subject to shifting priorities at the Systems Command and CNO level. Projects are accelerated, slowed down, or cancelled on short notice. At times, we feel the laboratories

are used as surge tanks to accommodate excess fund availability on the part of our customers or even as a source of funds when contracts overrun. In many cases a Work Request is not treated as a contract with a laboratory. It is treated as a level of effort program subject to change at the whim of a program manager at headquarters. [Ref. 43]

The foregoing suggests that actual funding practices may vary from the official, classroom perception. To the extent this is true, informal agreements between sponsor and laboratory play a large roll in planning. Funding practices by laboratory customers is an interesting subject, perhaps a good thesis topic in itself. It is outside the scope of this thesis to evaluate funding practices except as they impinge on stabilized rates. However, with the addition of another laboratory management constraint in the form of stabilized rates, volatile funding patterns will be less acceptable.

3. Increase in Vulnerability to Economic Upheaval

All NIF activities, Navy laboratories included, are more vulnerable to upheavals in the economic environment under fixed rates. This vulnerability is illustrated by the experience of the Military Sealift Command (MSC) during the oil embargo of late 1973. MSC is an industrially funded Naval Activity which both leases and operates merchant ships on behalf of a wide variety of DOD customers. Operating results, i.e., the net changes to the corpus are shown in Appendix C. From 1950 through the early seventies, operating results hovered near the break-even point. In 1974 MSC experienced an unprecedented 78 million dollar loss. As a

consequence rates were raised for 1975 resulting in an 86 million dollar profit. [Ref. 44] The 1974 loss is associated with steep increases in fuel costs stemming from the oil embargo. While the MSC would have experienced a loss because of unprecedented changes in fuel costs in any case, the magnitude was much greater because rates were frozen. Otherwise, MSC could have initiated a series of rate increases throughout the fiscal year. In accordance with NAVCOMPT Instruction 7600.23 [Ref. 11], MSC raised its rates the following year to recoup the deficit. Oscillations of profits and losses are a logical outgrowth of severe changes in costs under fixed rates. In such a situation, rates remain constant within a year but fluctuate more between years. Given economic upheavals, the fluctuations shown by Appendix C are not necessarily the most undesirable of various possibilities. The fluctuations shown are, however, predictable at any NIF activity under similar circumstances.

4. Transfer of Some Control from Laboratories to Headquarters

Another result of the new policy will be the migration of responsibility and control to headquarters echelons. There is nothing innate in the concept of fixed rates which should diminish control at local NIF activities. However a collateral ingredient of the new policy is responsible for this result. This ingredient is the key role of the group activity corpus manager. The role of the group commander is established by paragraph 3 of the basic NAVCOMPT Instruction which reads in part as follows:

....The activity group commander will approve the number, and kind of rates to be established based on each activity's organizational structure, diversity of workload and other management considerations. Stabilized rates submitted by the activities will be reviewed and adjusted by the activity group manager, to provide the necessary changes to offset the total prior year gains or losses, thereby achieving zero profit and loss in the Accumulated Operating Result Accounts of the activity group. Gains and losses will normally be fully offset during the year following their occurrence and will be reflected uniformly in the rates of the activity group. [Ref. 11]

The designation of group manager conforms to existing organizational patterns. For the eight NAVMAT laboratories, the group manager is MAT 035 in the Office of the Chief of Navy Material. The wording of the basic instruction clearly says that it is MAT 035 which is a control point and not each of the component laboratories. By implication the setting of rates at a specific laboratory can be affected by factors that have nothing to do with the laboratory itself. A specific laboratory can be affected by the financial status of other laboratories. This is noted in a question and answer attachment to memorandum signed by Mr. G. D. Penisten, Assistant Secretary of the Navy (Financial Management) which says, "The current policy of distributing a pay back rate uniformly to all activities within an industrial group could very well result in an individual activity perpetuating an operating loss indefinitely." [Ref. 25] Mr. Penisten then adds that this feature is under review within the Navy. However, until and unless changed, the authority to set rates remains at headquarters.

An interesting aspect of centralizing pricing authority is that it potentially paves the way for a total change in price philosophy. Even though "group managers" control rates, each laboratory still has a set of rates based upon its own costs. Although profits at one laboratory may be used to offset losses at another to maintain the group corpus, rates remain dependent upon cost factors at individual laboratories. The mechanism of a group manager could permit the evolution of one standard rate for all Navy laboratories, nationwide. Differences in costs between laboratories would then reflect themselves as inter-laboratory variances which should net out to zero in the aggregate.

5. Increasingly Conservative Behavior by Management

The effect of fixed rates controlled at a higher organizational level will put pressure on laboratory management to behave conservatively. Operating under externally managed rates represents yet one more local constraint. Failure to achieve a break-even point creates unwanted visibility. The prevailing climate on this issue is revealed in the Question and Answer attachment to a memo by the Assistant Secretary of the Navy (Financial Management) which reads as follows:

Does not the implementation of this procedure represent an apparent departure from the long established principle that control of industrial fund operation is vested at the activity group level?

No. Management will be held accountable for losses resulting from operations. The local activity managers should be prepared to explain all losses in terms of pay raise cost variance,

material cost variance and other such specific terms. The term rate stabilization is a general term and will not be considered adequate to explain the specific variances that caused the gain or loss. OSD has directed that rate stabilization be implemented as a means to eliminate perturbations in the budgeted program. [Ref. 25]

Rates are developed on a long-lead time basis and the element of uncertainty is very high. If the rate is grossly in error, whether caused by events or calculation error -- permission for a mid-year change must be obtained from OSD. The administrative correspondence strongly advises that such petitions are not encouraged. The new policy as currently structured insures that the laboratory manager will be scrutinized and judged if his rates generate variances. The conclusion is that variances are not career enhancing. It logically follows that managers will be biased, perhaps unconsciously, in favor of courses of action which minimize the probability of large variances. This bias may not be undesirable in itself. It does not, however, relate to the basic missions of the laboratories.

E. ACCOUNTING ASPECTS

Accounting, under stabilized rates, becomes somewhat more complicated. Project costs can be expressed either on an actual basis or on a stabilized rate basis. By establishing two bases for expressing project costs, a new variance is created.

Technically, under stabilized rates, incurred labor costs are collected and recorded on an actual basis. It is the revenue flows which are priced on the basis of stabilized

rates. The difference becomes a variance. It is also one of the components of net changes in the corpus.

Some of the correspondence refers to stabilized rates as standard rates. They are not standard in the normal accounting sense. This is an important reservation to bear in mind. In accounting parlance "variance" is a word used in connection with standard cost systems. The essence of a standard cost system is the "should cost" concept.

The essential idea of a standard cost accounting system is that costs and inventory amounts are recorded at what costs should have been rather than what they actually were. At some point in the flow of costs through the system there is a shift from actual costs to standard costs. Wherever this shift occurs, a variance develops. [Ref. 13, p. 398]

A standard or "should-cost" system is based upon industrial engineering measurements of specific labor and machine operations. It is based upon physical quantities of input per unit of output. Laboratories possess no output accounting system. The basis of laboratory accounting is more accurately characterized as level of effort.

Under stabilized rates, the net change to the corpus, i.e., profit or loss, may be broken down as follows:

1. Variance for prior year profits or losses.
2. Variance for external considerations (activity manager).
3. Variance for fringe benefits acceleration, high or low.
4. Variance for direct labor price, i.e., errors in projection.
5. Variance for overhead, over or under absorption.

Items 1 and 2 are administratively set. A variance in items

3 or 4 is essentially forecasting error, but cannot be corrected during the year at the activity level. Local managers do not control fringe benefits for government employees. Salaries are set by law. Hiring and layoffs are tightly controlled. This leaves item 5 - overhead - as the only variance which may be subject to managerial control. The danger exists that management might attempt to work toward the stabilized rate through manipulation of overhead. The danger also exists that measurement of variances in the laboratories will be overemphasized as a surrogate gimmick for estimating laboratory productivity.

F. THE WEAPONS ACQUISITION PROCESS

The majority of work performed by Navy Laboratories is paid for out of Research, Development, Test and Evaluation (RDT&E) funds. Navy laboratories are part of the weapons procurement complex. In this respect Navy Laboratories contrast with most other NIF activities whose customers are primarily O&M,N funded.

Respondents in laboratory interviews believed that stabilized rates would have only a minimal effect upon their relations with sponsors. Weapons systems projects typically plan a certain level of effort at a laboratory. The end project is to achieve a specific rung on the development ladder or reach some go/no go decision point. Typically, funding changes result in increases or decreases in the level of effort. The factors in determining the level of effort are rate times man-hours worked. Fixing the rate attaches

certainty to only one of the two cost factors. The more uncertain factor, the quantity of inputs needed to attain an objective, remains relatively uncertain. This distinguishes R&D from other NIF activities where labor inputs per unit of output are predictable. This line of reasoning suggests that stabilized rates alone will not offer comfort to RDT&E users in the same measure as O&M,N users.

Another possibility to be examined is whether stabilized rates will result in some redistribution of program costs. For example, one program may utilize GS-6 technicians at a laboratory whereas another program utilizes GS-14 physicists. Formerly, the second program would have been more costly than the first to the extent that GS-14's are costlier than GS-6's. Under stabilized rates both projects would pay the same per hour of effort. The project utilizing GS-14's would be, in effect, subsidized.

A statistical analysis by the Naval Weapons Center indicates that this should not be a problem. A small, one or two man laboratory effort may show substantially different results between stabilized rates and actual costs, but with larger efforts, the statistical effect of large samples take effect. The mean labor rate for the project approaches the mean rate for the organization. Situations where stabilized rates cause distortions between programs will be rare.

If program managers were to bring undue pressure on laboratories to assign highly-paid personnel (since they cost the same as low-paid personnel) there are methods of counter-ing the problem. First, different rates could be used for

different salary brackets. One laboratory has structured rates on a grade level basis. Second, low cost support personnel could become overhead costs. It would be unfortunate if the issue of the grade level assigned to programs became the subject of gamesmanship. No evidence of this has been detected in the course of gathering material for this thesis.

It is suggested here that the probability of stabilized rates directly affecting the weapons acquisition process, positively or negatively, is minimal. To the extent that stabilized rates result in behavior changes in the laboratories, there is a significant indirect effect.

G. CONCLUSION OF ANALYSIS

The issue of stabilized rates becomes part of a larger issue as to how the Federal government is to be organized. What degree of decentralization is optimal? What role does divisionalization play in the Federal government?

Industrially funded activities are ambivalent organizations. On the one hand they are pseudo-commercial entities within the government. On the other hand they are subject to Federal statutory and administrative controls.

The Department of Defense outlines NIF objectives. The first three objectives listed read as follows:

1. Provide a more effective means for controlling the costs of goods and services required to be produced or furnished by industrial and commercial-type activities, and a more effective and flexible means for financing, budgeting and accounting for the costs thereof;
2. Create and recognize contractual relationships between industrial and commercial-type activities

and those activities which budget for and order the end-products or services, in order to provide management advantages and incentives for efficiency and economy;

3. Provide to managers of industrial and commercial-type activities the financial authority and flexibility required to procure and use manpower, materials and other resources effectively. [Ref. 3]

These objectives would seem to stress efficiency and cost control rather than homogeneity and conformity. NIF activities have always had to comply with all applicable regulations. However, NIF managers, in certain areas, have had local discretion in how to comply. Present events give the appearance of a trend toward centralization and standardization, a trend which comes at the expense of the discretion and flexibility left to the industrial manager.

In *Divisional Performance: Measurement and Control* [Ref. 14], Solomons indicates that many corporations are highly divisionalized. Divisional autonomy is encouraged up to a point, in order to maximize profit. The degree of autonomy varies. In some instances, divisions are free to engage in fierce market competition. In other cases, most divisional decisions are orchestrated at corporate headquarters.

When divisionalization does occur, some measure of divisional performance is needed. The yardstick may be return on investment, net profit, or a complex combination of factors. [Ref. 15, pp. 395-410] The choice of measuring device has some influence on behavior of divisional managers. A manager maximizing return on investment can lease assets in order to reduce the denominator of the ratio by which he

is evaluated, thus improving his report card. Some divisional performance considerations apply to the industrial fund manager.

Industrial fund activities are pseudo divisions. They buy resources and sell to customers in a producer-user relationship. However, industrial fund activities are not supposed to have extensive profits or losses and their customers are other government activities. The industrial fund manager finds surrogate measures of performance -- cost control, volume, service quality, etc. These should not be derogated. With good judgement, surrogate measures can be closely related to organizational mission.

Problems arise as new external constraints are added if compliance with constraints becomes a measure of divisional performance. When this happens, the basic purpose of the organization is subordinated in the decision-making process.

The NIF process appears to imply a degree of divisionalization. Additional constraints make it more difficult to pursue the industrial activity's basic purpose. Care must be taken that an excellent record in conforming to the constraints does not become more important than optimum performance in pursuit of the basic mission.

V. CONCLUSIONS

The major conclusions of this thesis are as follows:

1. Customers of non-R&D NIF activities using stabilized rates are benefited due to the improved budgeting capabilities.
2. Non-R&D NIF activities already using stabilized rates have made the transition to stabilized rates successfully.
3. The benefit to customers of R&D activities appears to be minimal since most R&D is funded on a level of effort basis.
4. NIF R&D activities can successfully manage under stabilized rates. This success depends greatly on how rate-setting is administered.
5. Rates should be carefully developed to reflect local costs at each activity, with minimum adjustment at higher levels.
6. An activity manager should not manipulate overhead to minimize profit or loss. Measurement and control of overhead expenditures is an appropriate end in itself.
7. A NIF manager's effectiveness should not be measured principally by the size of variances incurred.
8. Rate manipulation is the least desirable means of corpus management at the group manager's level. A management strategy which emphasizes managerial accountability within the activity and utilizes intra-corporate transfers is preferable.
9. The possibility of incurring legal problems at the activity level appears rather remote. The legal questions

which have been raised concerning possible R. S. 3678 and R. S. 3679 violations do not appear to be of a serious nature to the local activity managers.

Rate stabilization is a dynamic on-going process. The final answer as to its success or failure can be determined only after the policy has been fully implemented and the actual results of several years of use are available. Another study at a later date might provide an area for further research.

APPENDIX A

LIST OF LABORATORIES

Excerpted from Reference 12

<u>Name and Location</u>	<u>Mission</u>
Naval Air Development Center (NADC) Johnsville, Pennsylvania	RDT&E center for Naval Aircraft Systems.
Naval Coastal Systems Laboratory (NCSL) Panama City, Florida	RDT&E center for the application of science and technology associated with military operations carried out primarily in the coastal region and to perform investigations in related fields of science and technology.
Naval Electronics Laboratory Center (NELC) San Diego, California	Systems Engineering for Command Control Telecommunications.
Naval Ordnance Laboratory ¹ (NOL) White Oak, Maryland	RDT&E center for Ordnance Technology, concepts and systems. Capabilities for strategic systems, Naval mine systems, multimedia weapons systems, fuse development, inshore warfare ordnance, small craft armament, swimmer weapons systems, ordnance technology.
Naval Ship Research and Development Center (NSRDC) Washington, D. C.	RDT&E center for Naval vehicles and to provide RDT&E support to the U. S. Maritime administration and the maritime industry.
Naval Undersea Center (NUC) San Diego, California	RDT&E center for undersea surveillance, advanced surface and air launched undersea weapons systems, and deep ocean technology.
Naval Underwater Systems Center (NUSC) Newport, Rhode Island	RDT&E center for underwater combat systems.
Naval Weapons Center (NWC) China Lake, California	RDT&E center for air warfare and missile weapons systems.

APPENDIX A (Continued)

<u>Name and Location</u>	<u>Mission</u>
Naval Weapons Laboratory ¹ (NWL) Dahlgren, Virginia	RDT&E center for warfare analysis, systems integration, and fleet engineering support in Naval Weapons systems, principally for surface warfare.
Naval Research Laboratory (NRL) ² Washington, D. C.	To conduct a broadly based multidisciplinary program of scientific and advanced technological development directed toward new and improved materials, equipment, techniques, systems, and related operational procedures for the Navy.

¹NOL and NWL have been administratively combined and are now the Naval Surface Warfare Center (NSWC), White Oak, Maryland.

²All of the Laboratories listed report to Chief of Naval Material with the exception of NRL which reports to the Chief of Naval Research.

APPENDIX B

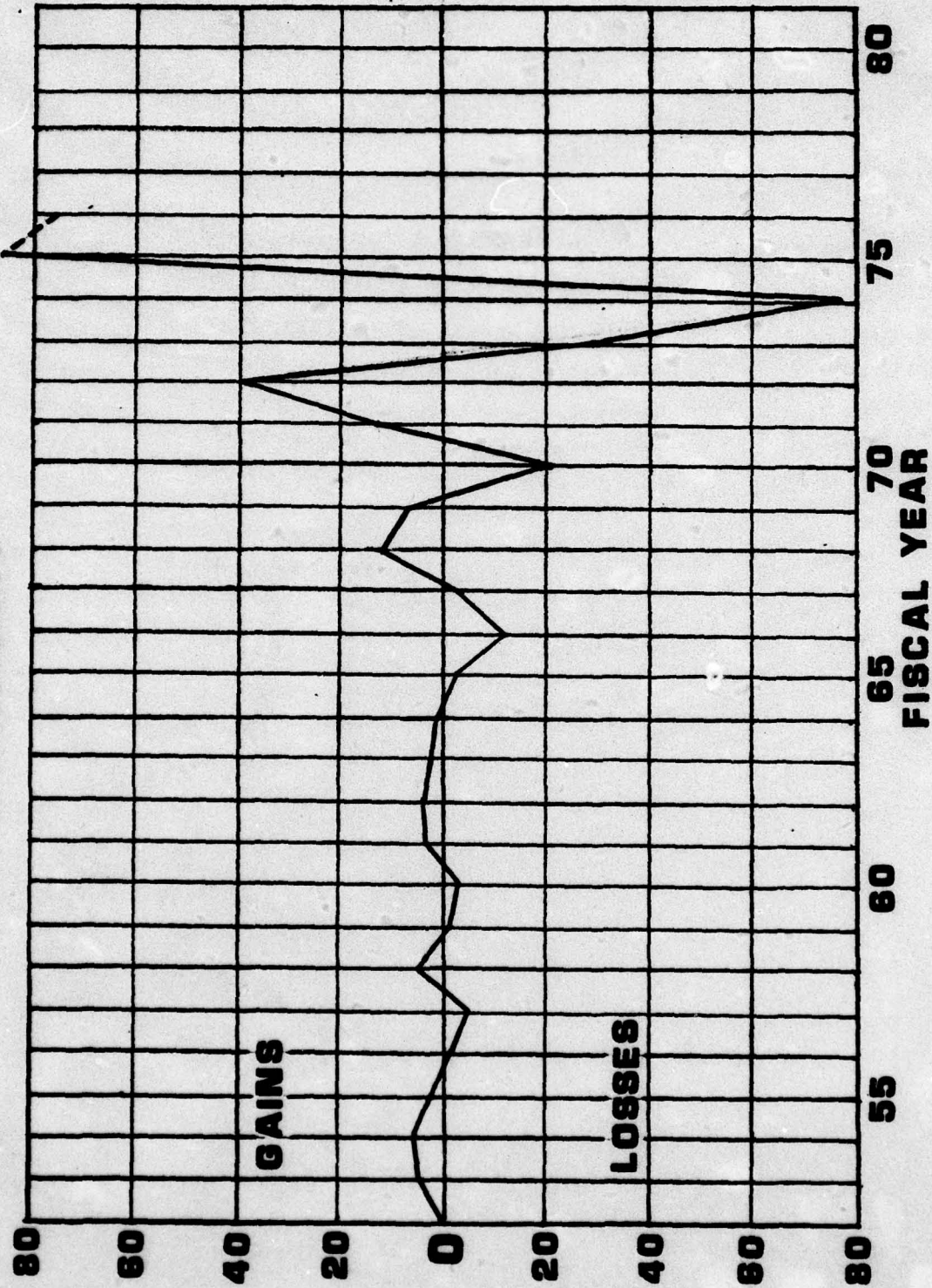
LABORATORIES - SIZE & BUDGET

Excerpted from Reference 12

NAME	CIVILIAN CEILING (END OF FY 73)	OPERATING BUGDET (MILLIONS, 1973)	CORPUS 1973 MILLIONS
NADC	2187	\$136.6	
NCSC	577	\$17.8	
NELC	1473	\$56.5 (\$70.0 for FY 76)	\$1.0
NOL	2700	\$98.8	
NWL NSWC	2916	\$96.5 (\$230 for FY 76)	
NSRDC	2895	\$119.6	\$2.0
NUC	1645	\$77.9 (\$90.0 for FY 76)	\$.75
NUSC	3325	\$109.1	
NWC	4412	\$180.7 (\$200.0 for FY 76)	\$2.0
NRL	4026	\$187.3	

APPENDIX C

MILITARY SEALIFT COMMAND OPERATING RESULTS (\$ MILLIONS)



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