

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

2

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 1993		3. REPORT TYPE AND DATES COVERED ADODCAS 1993	
4. TITLE AND SUBTITLE ANALYZING THE IMPACT OF PREFUNDING POSTRETIREMENT BENEFITS OTHER THAN PENSIONS (PRB) ON DOD CONTRACTING				5. FUNDING NUMBERS	
6. AUTHOR(S) Richard Marshall				7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) HQ AMCCOM Rock Island, IL 61299-6000	
8. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				9. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES Annual Department of Defense Cost Analysis Symposium Paper					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Statement A: Approved for Public Release; Distribution is Unlimited				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) See Over DTIC QUALITY INSPECTED 2 6586 94-04875 94 2 10 1993					
14. SUBJECT TERMS BENEFITS PENSIONS				15. NUMBER OF PAGES	
17. SECURITY CLASSIFICATION OF REPORT U				18. SECURITY CLASSIFICATION OF THIS PAGE U	
19. SECURITY CLASSIFICATION OF ABSTRACT U				20. LIMITATION OF ABSTRACT UL	
16. PRICE CODE				17. SECURITY CLASSIFICATION OF ABSTRACT U	

DTIC
ELECTE
FEB 14 1994
S E D

AD-A275 658



**Best
Available
Copy**

**ANALYZING THE IMPACT OF PREFUNDING POSTRETIREMENT BENEFITS
OTHER THAN PENSIONS (PRB) ON DOD CONTRACTING**

Recent changes to the Federal Acquisition Regulation (FAR) allow contractors the option of prefunding retiree medical and life insurance benefits (known as PRB) on an actuarially determined accrual basis, rather than continuing with the traditional pay-as-you-go funding method. The net result of this change for government contracts is a potential four to ten-fold increase in these costs for the near term, as contractor's who elect to prefund are allowed to amortize the accumulated unfunded liability over a period of 20 years or less. This paper will focus on the practical experience of the Headquarters, U.S. Army Armament, Munitions and Chemical Command (HQ, AMCCOM) Cost Analysis Directorate with the government-owned, contractor-operated (GOCO) ammunition industrial base during the current era of sharply declining defense spending. The paper's scope will span the treatment of prefunding at all stages of the acquisition process, including planning, budgeting, technical evaluation of contractor proposals, preparation of independent government positions, pricing, contract negotiations, and adoption of source selection evaluation criteria. Particular emphasis will be placed on PRB-related policy, actuarial principles (including valuation techniques), as well as key issues and problems related to this sometimes controversial, but generally little understood, component of contractor overhead.

Richard Marshall
HQ, AMCCOM
AMSMC-CAS
Rock Island IL 61299-6000
DSN 793-2683
Comm (309) 782-2683

**Understanding and Analyzing the Impact
of Prefunding Postretirement Benefits Other than Pensions (PRB)
on Department of Defense Contracting**

for Presentation at the
27th Annual DoD Cost Analysis Symposium

June 1993

Prepared by:

Mr. Richard Marshall

**Cost and Systems Analysis Directorate
Headquarters, U.S. Army Armament Munitions
and Chemical Command
Rock Island, IL 61299-6000**

Accession For	
NTIS CRA&I	☒
DTIC TAB	☒
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

DTIC QUALITY INSPECTION

TABLE OF CONTENTS

Section I	Introduction	1
	Ammunition Industrial Base Overview	2
	GOCO Organization	3
Section II	A PRB Primer for Beginners	5
	Scope of PRB Benefits	5
	Medical Benefit Plans (General)	5
	Integration with Medicare	6
	PRB Eligibility Requirements	7
Section III	New PRB Financial and Funding Policies	8
	Problems with the Status Quo	8
	Questions of Liability for GOCO Contracts	8
	Statement of Financial Accounting Standard No. 106	9
	Government Cost Accounting Policy and PRB	12
Section IV	PRB Actuarial Concepts and Relationships	17
	Participant Timelines	17
	Estimating Future Benefits	20
	Calculating PRB Obligations and Service Costs	30
	Survival Factors for Males and Females	35
	Calculating the Prefunded Contribution	38
Section V	Discussion of Assumptions and Input Data	40
	Census Data	40
	Per Capita Cost Development	42
	Medical Cost Trend (Inflation)	44
	Discount Rate	46
	Mortality	46
	Other Assumptions	48
Section VI	PRB Case Study – Ravenna AAP Prefunding Agreement	50
	Prefunding Projections	50
	Comparison with Other Prefunding Agreements	52
	Prefunding Reality Check	52
	Plant Shutdown Liability	54
Section VII	Other PRB Topics	56
	Negotiating Process	56
	PRB Cost Model	56
	Contractor Pricing/Competitiveness Issues	56
	Contract Terminations	57
	Potential Policy Conflicts	58
	Contractor Funding/Tax Implications	59
Section VIII	Conclusion	60
Appendix	Selected Bibliography	61

Section I

Introduction

The advent of new private-sector accounting standards, with accompanying modifications to the Federal Acquisition Regulation (FAR), has created a sea-change in the accounting and associated costs of medical and life insurance benefits for contractor retirees. These benefits, which are known as Postretirement Benefits Other than Pensions (or PRBs for short), generally include all post-retirement fringe benefits other than pension annuities. In practical terms, over 90 percent of the PRB cost is associated with medical and prescription drug benefits, with the remaining cost attributable to life insurance premiums. The new concept inherent in these accounting standards and regulations is the application of accrual-based accounting to PRBs.

In the past the vast majority of businesses have accounted and paid for PRBs on a pay-as-you-go basis, rather than using accrual accounting. Pay-as-you-go accounting simply meant the costs associated with providing retiree benefits were expensed as actual claims were submitted during an employee's retirement years. In other words, the pay-as-you-go accounting cost was completely divorced in time from the corporate liability as measured during retirees' working lifetimes. Now, with accrual accounting required for contractor financial statements, financial counting will explicitly link corporate balance and income statements with the associated obligation measured as of the current accounting period in a cost-beneficial relationship. These accrued PRB costs represent future benefits to be paid to both current retirees and active employees after retirement. The private sector accounting standard does not require corporations to actually fund these PRB accruals; however, the FAR does recognize accrual cost accounting (hereafter interchangeably referred to as prefunding) as an allowable cost, provided certain conditions are met.

The major cost impact of prefunding will come as a result of the initial transition from pay-as-you-go to accrual basis accounting. The FAR allows contractors to recognize the unfunded liability for benefits previously earned, but not yet expensed, by amortizing this liability over a fixed period, generally twenty years. For a business in its' mature lifecycle, with many current retirees and an older workforce, the transition obligation could result in accrual costs to be anywhere from three to ten-times higher than the historical expenditures for pay-as-you-go benefits.

The actual experience for the Army ammunition industrial base to date indicates the prefunded contribution will be about three

to four times higher than the pay-as-you-go cost would have been, with the majority of this increase due to the amortization of the transition obligation. Eventually, after the transition obligation has been fully amortized, the annual PRB contribution will only include costs for the current accounting period's accrual of benefits earned during that year. As of this time, the current period's accrual cost will be less than the current pay-as-you-go benefit cost, with the lower costs long-term offsetting the higher costs in the near term. Therefore, from a long-term perspective which considers the time value of money, the cash flow streams associated with prefunding and pay-as-you-go accounting must be equal. In the short- and intermediate-term, however, there is no escaping sharply higher costs if the contractor elects to prefund.

This paper will discuss in detail how a U.S. Army Material Command (AMC) Major Subordinate Command (MSC) is planning for and actually implementing this "new way of doing business". The perspective will be primarily from a cost and pricing analysis viewpoint, but by necessity legal and accounting policy viewpoints must also be addressed. The contents of this paper are not intended to represent authoritative policy or direction on the treatment of PRB in DoD contracting. Instead, this paper is intended to provide practical information on how PRB costs can be analyzed and interpreted, using the experience of one Army command as a case study.

Ammunition Industrial Base Overview

General Background

The new acquisition regulation on PRB, which considers accrual-based cost accounting an allowable cost, is having a major impact on the Headquarters, U.S. Army Armament, Munitions and Chemical Command (HQ, AMCCOM) ammunition industrial base. To fully understand this impact, it is necessary to understand the nature of the this industrial base. The ammunition industrial base is made up of 25 government-owned, contractor-operated (GOCO) Army Ammunition plants located nation-wide in generally rural locations. These plants are in various status-categories: active, inactive and Modified Caretaker. Active plants are engaged in the manufacture, final assembly, and storage of ammunition items. These plants have production orders directly assigned by the AMCCOM Production Directorate. Inactive plants have no production contracts directly workloaded by the AMCCOM production directorate, but may have third-party contracts with other DoD buying agencies. Active plants may also have third party workload. Modified Caretaker plants have been removed from the mobilization base, and only minimal maintenance is required.

GOCO Organization

GOCO ammunition plants are operated by contractor personnel, with small government Administrative Contracting Officer (ACO) staffs for on-site oversight. Historically, the GOCO contracts have been cost plus incentive fees type contracts. The procurement contracting officer (PCO) for these contracts is located at HQ, AMCCOM. The contract period is generally one year in length, with options for four annual contract extensions. Generally, contracts are awarded on a noncompetitive basis. This policy has resulted in long-term relationship between AMCCOM and the GOCO contractors, often measured in decades. This has allowed plant contractors to build up substantial retiree populations (refer to Exhibit 1). At some inactive plants the retirees out number the current employees.

Each plant is considered a separate segment for cost accounting purposes, with its' own accounting disclosure statement. Contractor benefits are reviewed and approved by the AMCCOM Industrial Relations Office, which ensures the benefit package is in line with the company's non-GOCO corporate benefit structure, as well as the benefits paid by the overall industry (e.g. the chemical industry or armament manufacturers). Not all contractors offer PRB to retirees. Whether a contractor offers PRB or not is determined by competitive pressures within industries, as well as by general corporate policy and philosophy. At AMCCOM six contractors, operating ten plants, offer PRBs. Postretirement benefit plans differ substantially between contractors, and even between different employee groups. Salaried and hourly employees generally have different plans. PRB is a fringe benefit and an element of contractor overhead. PRB is generally allocated either as a fringe benefit rate applied to labor costs, or using the value-added concept (e.g. apportioned on a total cost basis less direct material less subcontracts). PRB must be fairly allocated to all customer orders on a consistent basis. This would include allocating costs to all AMCCOM direct workload, third-party workload, commercial workload (if any) and any plant tenants/subcontractors who receive services from the prime contractor.

EXHIBIT 1

PRB Populations and Costs
for AMCCOM GOCO Contractors

<u>Plant</u>	<u>Current Status</u>	<u>Future Status</u>	- Contractor Populations -		Pay-as-you- go PRB Cost CY91
			Active 31 Jan 93	Retirees CY 91	
Louisiana	Active	Inactive	1,112	210	\$328,737
Longhorn	Active	Inactive	757	382	539,767
Sunflower	Inactive	Inactive	321	98	510,808
Holston	Active	Active	885	756	2,957,477
Lake City	Active	Active	1,762	152	420,960
Milan	Active	Active	1,495	52	371,992
Radford	Active	Active	2,691	2,012	4,461,121
Badger	Inactive	Inactive	231	43	68,124
Joliet	Inactive	Mod. Caretaker	160	594	1,474,511
Ravenna	Inactive	Mod. Caretaker	149	196	498,022
Totals			9,563	4,495	11,631,519

Source: Active populations from GOCO Plant Personnel Forecast, 19 Feb 93.
Retiree populations and actual PRB costs from CY91 plant data call,
26 May 92; Sunflower cost is CY90 actual.

Section II

A PRB Primer for Beginners

Scope of PRB Benefits

PRB is a broad classification of benefits and is self-descriptive -- it includes all benefits received by retirees except pension annuities. As stated earlier, PRB is primarily limited to health and life insurance benefits, but other benefits, such as tuition assistance, can also be included. For AMCCOM GOCO contractors, the primary cost driver are medical benefits, which make up 90 to 95 percent of the total cost, with life insurance benefits representing the remainder. Medical benefits include basic medical, prescription drug plans, dental, and reimbursement of Medicare premiums. Sometimes PRB is referred to as retiree health and life insurance benefits (HLIB). It is important to keep two concepts in mind. First, not all contractors offer PRB of any kind, and some contractors may only offer medical benefits, and not life insurance. Secondly, PRB deals strictly with retiree benefits, and does not address or alter the way active benefits are accounted for or funded. Costs associated with active employees in the PRB context are for accrual or prefunding of benefits to be received after the active employee retires, not while actively employed. PRB also includes costs associated with disabled individuals who retire after Long Term Disability (LTD) payments end, though these costs are so minor they have been excluded from the scope of this analysis. This paper will deal almost exclusively with retiree medical benefits, as this represents the majority of PRB costs.

This paper deals strictly with the PRB factual situation prior to the introduction of President Clinton's health care reform bill; it is very possible the Clinton Administration's proposal could significantly alter the PRB costs and obligations contractors will encounter in the future.

Medical Benefit Plans (General)

Before we discuss retiree medical benefits per se, we should cover some concepts and terminology common to all types of medical benefits. The government has encouraged contractors to be self-insured and assume the risk of reimbursing medical claims directly, rather than purchasing medical insurance through third-party insurance companies (e.g Blue Cross or similar organizations). The advantage to the government is lower administrative costs, by cutting out a layer of bureaucracy. All of AMCCOM's GOCO contractors are self-insured. Contractors do rely on third party claim administrators to handle processing and billing of claims, which results in an administrative fee of approximately 5 percent of claims.

There are two basic types of plans: defined benefit and defined contribution. A defined benefit plan, the most common type, is one most of us are familiar with. This type of plan specifies a certain reimbursement for each type of claim (e.g. 80% coverage for outpatient surgery, 70% coverage for hospitalization). The employer's final cost is a function of the benefit provided, within the framework of participant contributions, deductibles, and co-insurance. A defined benefit plan does not give employers total control over costs, as costs are a function of the patient's utilization of services and prevailing medical practices. Of course, many cost containment measures may be adopted with a defined contribution plan (e.g. use of preferred provider organizations, mandatory use of generic prescription drugs, increases to participant contributions and deductible levels) in order to control costs.

The second overall type of plan is called a defined contribution plan. A pension annuity is an example of a defined contribution benefit, where the benefit is determined by a mathematical formula with employee salary and years of service inputted into a formula to determine the retiree's annuity. For medical benefits, a defined contribution plan would be where an employer sets aside a predetermined amount per person to pay for medical insurance, with the employee responsible for any remaining cost. An employer could opt to recalculate the contribution annually to maintain a desired mix of employer and retiree contributions, in order to adjust for such factors as medical inflation. The advantage of the defined contribution plan over defined benefits plans is that the employer has more control over future costs. One would expect more and more employers to move to this type of plan in the future, especially as a cost containment measure taken in conjunction with the accrual and/or prefunding of PRB.

Integration with Medicare

The key concept which is specific to the retiree population is the impact of Medicare eligibility on plan costs. Medicare (technically known as Health Insurance for the Aged and Disabled under Title XVIII of the Social Security Act) is comprised of two basic programs: Hospital Insurance (HI), which pays for inpatient hospital care and other related care of those aged 65 and over and of the long-term disabled, and Supplementary Medical Insurance (SMI), which pays for physician services, outpatient hospital services, and other medical expenses of those aged 65 and over and the long-term disabled. Medicare coverage for retirees does not begin until age 65. Retirees under age 65 are covered solely by their employer's private coverage; retirees over 65 are covered by a mixture of Medicare and the employer sponsored plan. There are several ways to handle the interaction between Medicare and the employers plan, most typically being a simple "carve out" approach where the employer pays the

differential between what the company plan would pay and the Medicare reimbursement. This results in employer per capita (i.e. per person) medical costs for the pre-Medicare population being typically three times higher than the post-Medicare per person cost.

PRB Eligibility Requirements

Perhaps the most important aspect of PRB, at least from the retiree's viewpoint, is the criteria which an employee must meet in order to qualify for benefits. Although the specifics vary for each contractor, generally an employee must meet an age and years of service (YOS) criteria which qualifies the individual for an immediate annuity. An example of retirement/PRB eligibility would be having at least 10 years of creditable service and be age 55 or older. Generally, each company will have several retirement options; e.g. early, normal, under conditions of plant closure. It is important to distinguish between pension vesting requirements and PRB eligibility. Employees may be vested in pension benefits with as little as two years of service at any age, but would only be eligible for a delayed pension annuity, not an immediate one. Employees pension vesting insures most employees will receive some form of pension benefit, however small. PRB eligibility, however, is an all or nothing affair. If an employee is terminated (for whatever reason) before PRB eligibility is reached no benefit is received. In addition, unlike pensions, most employer plans do not link retiree medical benefits to years of service. A retiree with 10 YOS will generally receive the same benefit as a retiree with 35 YOS. Some employers are beginning to rethink this approach and adopt an approach related to pension annuities by basing PRB on creditable service years. This rewards employees depending on the relative service given to the corporation.

Retiree medical plans can include either family or single coverage. The spouse is generally referred to as a dependent. A deceased dependent who continues to receive medical benefits is known as a surviving spouse (or sometimes as a beneficiary). A certain percentage of retirees will have dependent coverage; surviving spouses will have no dependent coverage (because they are the dependent). Dependent children of retirees are generally eligible up to age 18 (or through completion of college). In rare circumstances, some children may have a medical condition which qualifies them for continuing coverage (e.g. some types of mental disorders). Keep in mind eligibility requirements and benefits offered vary from contractor to contractor. A description of the particular plan can be found in actuarial reports (if the contractor is prefunding) or in summary plan descriptions (SPD) which the employer provides to employees. Another source of information on plans and benefits are union agreements.

Section III

New PRB Financial and Funding Policies

Problems with the Status Quo

The impetus for the change in PRB accounting and funding policy was the uncontrolled explosion in health care spending which has occurred in our country over the last two decades. Retiree benefits, which were once taken for granted by both business and their employees, were now beginning to rival pensions in dollar magnitude. What was worse, the vast majority of American businesses were not required to account for or fund PRB benefits on an accrual basis. A survey in 1991 by the consulting firm of William M. Mercer found only 7 percent of firms surveyed were prefunding (New York Times, 24 Dec 91). Instead, the practice was to fund these benefits on a cash-basis, in the accounting period in which the claims were incurred by current retirees. This combination - rising medical costs coupled with cash-basis accounting - has resulted in huge unfunded liabilities for American business. The Big 3 auto makers have been particularly hard-hit: General Motors alone took a one-time non-cash charge against earnings of \$22 billion in 1992.

Closer to home, the Armament, Munitions and Chemical Command's (AMCCOM) ten GOCO plants have a combined liability of approximately \$250 - \$300M dollars, which represents almost a third of the ammunition revolving fund's hardware value for FY 93. The FY 91 annual pay-as-you-go actual costs for AMCCOM's GOCO contractors is at Exhibit 1. Of particular note are the relatively high costs and retiree populations at inactive plants such as Joliet and Ravenna. The high retiree-to-active population ratios at these plants are a result of liabilities accrued while the plant was in an active status. As of 23 Jun 93, the two AMCCOM contractors who are prefunding are Joliet and Ravenna. Holston has requested prefunding and negotiations are proceeding. Other GOCO contractors, for the time being at least, are remaining with pay-as-you-go accounting. It is anticipated the contractor's liability at AMCCOM will be paid off over 10 to 20 years as contractors gradually transition from pay-as-you-go accounting to prefunding of PRB. The additional cost of prefunding is anticipated to increase ammunition unit costs by approximately 5 percent.

Questions of PRB Liability for GOCO Contracts

The huge unfunded liabilities engendered by pay-as-you-go accounting have brought issues of legal liability to the fore. At various time in the past, most, if not all, AMCCOM GOCO

contractors have taken the position that the unfunded PRB liability is a government responsibility. Contractors hold the view that they have an "entitlement" to full reimbursement of all future obligations, including those incurred after contract termination, arising from operations under government cost plus GOCO contracts. The Army has a quite different view on this issue. The Army recognizes its responsibility to reimburse costs which are allowable, allocable, and reasonable for either pay-as-you-go or prefunding accounting during the performance period of the contract. Costs which are incurred during an accounting period are reimbursed on a cost plus basis under the concept of a "cost-beneficial" relationship. However, after contract termination for any reason (e.g. expiration of the contract, termination for cause or convenience) there is no further way to allocate costs against the contract. Any unfunded liability at this point would be solely the responsibility of the contractor. The contractor's "hobson's choice" then is to either continue to fund PRB on a pay-as-you-go basis with its attendant unfunded liability, or elect to reduce the liability via a prefunding agreement with the Army and cause a substantial increase in the contractor's overhead rate.

Statement of Financial Accounting Standard No. 106 (SFAS 106)

SFAS 106 was promulgated by the Financial Accounting Standards Board (FASB) as a response to this growing PRB problem. It is this statement which has compelled corporations to recognize their PRB liabilities as a non-cash charge against earnings, and opened the way for companies to more readily begin prefunding of PRBs. While this statement only applies to private industry and does not cover government contracts, federal acquisition regulations have been updated to be consistent with the statement. All contractors will have to follow SFAS 106 when preparing corporate financial statements. SFAS requires employers with 500 or more employees to disclose their PRB liabilities beginning in the first corporate fiscal year (CFY) after December 15, 1992. The SFAS 106 only requires that a non-cash charge be taken against earnings to reflect the company's liability for future retiree benefits; it does not require that corporations actually set aside cash to prefund PRB.

The purpose of SFAS 106 is to provide mandatory instructions to companies on switching over from pay-as-you-go to accrual accounting for PRB. Instead of accounting for PRB as a cash-expense during employees' retirement years, SFAS 106 requires companies to accrue the cost of these benefits over employees' working lifetimes. The present value (PV) of postretirement benefits must be fully accrued by the date the employee is eligible to receive the benefits. The period over which benefits are accrued is called the attribution period, and begins when an employee is hired and ends when the retiree is eligible to retire. As stated earlier, retirement eligibility is determined

based on employees satisfying employer-specific age and years of service criteria. The scope of SFAS 106 includes three specific classes of individuals:

Current Retirees - Those employees who retired prior to the actuarial valuation date.

Active Employees - All current employees who will be eligible to receive retirement benefits. Includes the subgroup "retirement eligibles".

Retirement Eligibles - Current employees who are immediately eligible to retire as of the actuarial valuation date. This is a subgroup of active employees (e.g. retirement eligibles plus non-eligibles equals total active employees)

Several key concepts provide the foundation for SFAS 106 PRB accrual costs:

Expected Postretirement Benefits Obligation (EPBO) - This is the actuarially determined present value of benefits earned by the population (including both retirees and dependents) as of the actuarial measurement date. This actuarial present value includes both the past service liability of all plan participants (see definition for APBO below) and the PV of future accruals for current active employees not yet eligible to retire.

Accumulated Postretirement Benefits Obligation (APBO) - This is the most important concept contained in SFAS 106. The APBO is often referred to as the past service liability or as the transition obligation. The APBO is the portion of the total actuarial present value (PV) of benefits (technically referred to as the EPBO, see above) earned by employees and retirees (including dependents) as of the actuarial measurement date. Current retirees and retirement eligibles have earned all of the EPBO, so the APBO and EPBO for these groups are equal. Actives not fully eligible to retire have earned a portion of the EPBO in proportion to the current years of service rendered to the total years of service expected to be rendered as of the retirement eligibility date.

Service (or Normal) Cost - The service cost is the value of PRB accruals earned by active employees during an accounting period. It represents only current period accruals, and excludes past service accruals and accruals charged against future accounting periods. Conceptually, the APBO is the PV of all prior service costs for an employee. Also, the APBO plus the PV of all future service costs will equal an employee's EPBO. Please note that no service cost is associated with current retirees and

retirement eligibles because all accruals must be recognized on financial statements before the employee's retirement eligibility date.

The APBO is an important concept because its' magnitude at the transition date from pay-as-you-go to accrual accounting determines how much of the past service liability is recognized on the company's financial statements. Corporations have two choices for recognizing this liability, either immediate or delayed recognition. Under the immediate recognition approach, the company takes a one-time charge against earnings for the entire past service liability. Delayed recognition gives companies the option of amortizing the total APBO over a fixed period of time. The amortization period is generally set at 20 years, if the average remaining working lives of active employees is less than 20 years, the contractor may elect to amortize for this shorter period of time. The amortization technique is based on a level payout of principle (defined as the APBO as of the transition date) and unequal interest payments (interest costs will be reduced as more of the principle is recognized over time.

Based on an understanding of two of the concepts described above (APBO and the Service Cost), the total PRB accrual cost can be determined. The accrual cost is formally known as the "Recognition of the Components of the Net Periodic Postretirement Cost", and is comprised of four distinct components:

- 1/ Amortization of the Accumulated Postretirement Benefit Obligation (ABPO)
- 2/ Interest on the APBO
- 3/ Service Cost
- 4/ Return on Plan Assets (credit)

The first and second components assume the APBO is recognized on a delayed recognition basis, as is required for government contracts. The amortization of the APBO is calculated as the APBO as of the transition date divided by the amortization period in years. Interest on the APBO is interest (using the agreed upon discount rate assumption) paid out to adjust the liability for the time value of money between one accounting period and the next. The third component, service cost, has been defined above. Finally, return on plan assets reflects a credit to the contribution due to trust fund earnings. The interest paid in the second component represents an increase to the accrual cost; interest earned by the trust fund in the fourth component represents a net reduction to the total contribution required.

An important requirement of SFAS 106 is that companies base SFAS 106 disclosures on the company's substantiative plan. The substantiative plan is the benefits and guidelines contained in formal, written promises to employees (generally found in the summary plan description booklets). This requirement precludes

companies from arbitrarily changing assumptions to reduce their SFAS 106 liabilities, without making any corresponding adjustment to the promises given employees and retirees. When negotiating with contractors, government personnel should be careful not to pressure contractors to make changes in assumptions which are not consistent with the current retiree medical plan. This would interfere with the government from encouraging the corporation to adopt cost containment measures, which after proper communication to employees, could result in lowered PRB liabilities and costs.

Government Cost Accounting Policy and PRB

The implementation of SFAS 106 in the private-sector created a need for the U.S. Government to take a position on PRB funding on government contracts. The governments response was a new Federal Acquisition Regulation (FAR) clause, FAR 31.205-6(o), which addresses both prefunding and pay-as-you-go PRB accounting. Refer to Exhibit 2-1, for a complete extract of FAR 31.205-6(o), and the SFAS 106 paragraphs the clause specifically cites. This clause allows contractors the option of choosing two types of accounting methods: 1) "PRB costs ...paid to ... an insurer, provider, or other recipient as current year benefits or premiums" (i.e. the pay-as-you-go approach) or 2) "paid to ...an insurer or trustee to establish and maintain a fund or reserve for the sole purpose of providing PRB to retirees" (emphasis added) (e.g. prefunding). The decision on which option to select lies entirely with the contractor.

The timeframe for changing from pay-as-you-go to prefunding also lies entirely with the contractor. Some contractors may choose to begin prefunding concurrently with SFAS 106 adoption, others may opt to delay the transition for several years. This decision can be influenced by several factors, the most important of which is the relative size of the unfunded liability in comparison to such yardsticks as a contractor's corporate-wide liability or revenue. When a GOCO segment is looked at in isolation, it is possible that the unfunded PRB liability would exceed the present value of future profits the contractor may expect to earn at the segment. Other criteria a contractor may consider when deciding to prefund are at Exhibit 2-2.

FAR 31.205-6(o) imposes several important conditions on the contractor. Most importantly, the costs must actually be funded by the time set for filing of Federal Income tax. "Funded" means an actual contribution must be made to an acceptable funding vehicle established to provide PRB for retirees (e.g. contractors cannot not use the money for some other purpose). Other important requirement of FAR 31.205-6(o) are that costs must be calculated in accordance with generally accepted actuarial principles, and that "...the government shall receive an equitable share in any amount of previously funded PRB costs which revert or inure to the contractor." This last principle,

EXHIBIT 2-1

FAR 31.205-6

(o) Postretirement benefits other than pensions (PRB). (1) PRB covers all benefits, other than cash benefits and life insurance benefits paid by pension plans, provided to employees, their beneficiaries, and covered dependents during the period following the employees' retirement. Benefits encompassed include, but are not limited to, postretirement health care; life insurance provided outside a pension plan; and other welfare benefits such as tuition assistance, day care, legal services, and housing subsidies after retirement.

(2) To be allowable, PRB costs must be reasonable and incurred pursuant to law, employer-employee agreement, or an established policy of the contractor. In addition, to be allowable in the current year, PRB costs be paid either to (i) an insurer, provider, or other recipient as current year benefits or premiums, or (ii) an insurer or trustee to establish and maintain a fund or reserve for the sole purpose of providing PRB to retirees. The costs in paragraph (o)(2)(ii) must also be calculated in accordance with generally accepted actuarial principles as promulgated by the Actuarial Standards Board, and be funded by the time set for filing the Federal income tax return or any extension thereof. PRB costs assigned to the current year. but not funded or otherwise liquidated by the tax return time, shall not be allowable in any subsequent year.

(3) Increased PRB costs caused by delay in funding beyond 30 days after each quarter of the year to which they are assignable are unallowable.

(4) Costs of postretirement benefits attributable to past service ("transition obligation") as defined in Financial Accounting Standards Board Statement 106, paragraph 110, are allowable subject to the following limitation: The allowable amount of such costs cannot exceed the amount of such costs which would be to that contractor fiscal year under the delayed recognition methodology described in paragraphs 112 and 113 of Statement 106.

(5) The Government shall receive an equitable share of any amount of previously funded PRB costs which revert or inure to the contractor. Such equitable share shall reflect the Government's previous participation in PRB costs through those contracts for which certified cost or pricing data were required or which were to subject to Subpart 31.2.

EXHIBIT 2-2

THE CONTRACTOR'S PREFUNDING
DECISION

LESS LIKELY TO
PREFUND PRB

SMALL PERCENT OF
BUSINESS IS GOV'T

HIGHLY COMPETITIVE
MARKET

FOR-PROFIT
ORGANIZATION

HIGH RELATIVE
COST STRUCTURE
(HIGH OVERHEAD/
LABOR RATES)

LOW RISK OF PROGRAM
DISCONTINUANCE

MORE LIKELY TO
PREFUND PRB

LARGE PERCENT OF
BUSINESS IS GOV'T

LIMITED OR SOLE
SOURCE PROCURMENTS

NOT-FOR-PROFIT
ORGANIZATION

LOW RELATIVE
COST STRUCTURE
(LOW OVERHEAD/
LABOR RATES)

HIGH PROBABILITY
OF PROGRAM
DISCONTINUANCE

(ADAPTED FROM MCQUADE INCORPORATED NEWSLETTER, WINTER 1991/92)

sometimes referred to as a "reversionary trust" ensures any excess assets at the time of plan termination will not enrich the contractor, but instead be returned to the U.S. government.

The most important cost principle within FAR 31.205-6(o) requires that any cost of past service (the transition obligation) be funded on a delayed recognition basis, as defined by paragraphs 112 and 113 of SFAS 106. Paragraph 112 allows for several amortization periods, depending on the specific situation:

Standard - The past service liability will be amortized on a straight line basis (equal principle payments each year, with unequal interest accruals) over 20 years.

Optional (Remaining Service Lives) - If the average remaining service life of active plan participants is less than 20 years, then the contractor has the option of amortizing over this shorter period.

Specific Situation (Average Remaining Life Expectancy)
- If all or almost all of the plan participants are retired (inactive), the contractor must amortize over the average remaining life expectancy of plan participants. An example of this type of situation would be a plant placed in a minimal upkeep status with very few active employees, but having a large retiree population as the result of prior year production contracts.

It is vital that government contract personnel realize that the immediate recognition approach described in SFAS 106 paragraph 110 and 111 is explicitly disallowed for government contracting purposes. Immediate recognition allows the total APBO to be recognized immediately against income in the period of the transition as the effect of the change in accounting principle. No immediate recognition (also known as lump-sum, buy out, one-time cost) of the unfunded PRB liability is allowed on government contracts, even though the contractor may elect to take a one-time charge on corporate financial statements. Exhibit 2-3 compares the requirements of FAR 31.205-6(o) with those of SFAS 106.

EXHIBIT 2-3

COMPARISON OF PRIVATE AND GOVERNMENT PRB POLICY

<u>ISSUE</u>	<u>SFAS 106</u>	<u>FAR 31.205-6(o)</u>
DISCLOSURE REQUIRED?	YES, CONTRACTOR MUST INCL. PRB LIABILITY ON BALANCE SHEET	NO REQUIREMENT FOR DISCLOSURE
PREFUNDING REQUIRED?	OPTIONAL. ONLY A NON-CASH CHARGE REQ'D.	YES, IF USE ACCRUAL METHOD. A CONTRACTOR MAY ELECT EITHER PAY-AS-YOU-GO OR ACCRUAL ACCOUNTING. IF USE ACCRUAL METHOD THEN MUST FUND AN APPROVED TRUST VEHICLE WITHIN CERTAIN TIME LIMITATIONS.
WHEN IMPLEMENT ACCRUAL/ PREFUNDING?	FIRST FISCAL YEAR STARTING AFTER 15 DEC 1992	CONTRACTOR'S DECISION.
TIME PERIOD ALLOWED FOR DISCLOSING PAST SERVICE LIABILITY?	TWO CHOICES: IMMEDIATE OR DELAYED RECOG- NITION.	DELAED RECOGNITION ONLY; MUST FOLLOW PARA 112/113 OF FASB 106.

Section IV

PRB Actuarial Concepts and Relationships

This section is intended to provide the reader with non-technical, step-by-step quantitative examples of how the various definitions and concepts described in SFAS 106 relate to one another, and how they are combined to calculate the annual prefunding contribution. The three individuals described in the timelines section will be continued forward into the cost estimation sections to maintain consistency. The cost data used in this section is not based on any specific real-world PRB agreement; however, the cost data and assumptions are generally in line with those contained in actual prefunding agreements. This section is not intended to provide detailed explanations of the various PRB-related assumptions used, but rather an overview of how the assumptions interact to result in a completed valuation. The next section of this paper will discuss specific assumptions in more detail.

The actuarial concepts described below are consistent with the Projected Unit Credit Actuarial technique, which SFAS 106 mandates be used to estimate PRB obligations. This technique is used by actuaries to estimate the PRB liabilities and costs faced by their clients; the completed analysis is called an actuarial valuation. The results of the valuation are included in a valuation report, which also contains the actuarial assumptions and summary census data used in the analysis.

The terms "obligation", "liability", and "contribution" are based on the contractor's viewpoint; from the standpoint of the government, the costs associated with a contractor's obligations, liabilities and PRB trust plan contributions may be allowable cost items for reimbursement on a contract.

The equations included in the following exhibits employ the following symbols for mathematical notation: "+" is the addition symbol, "-" is subtraction, "*" is multiplication, "/" is division, and "^" represents an exponent.

Participant Timelines

The easiest way to understand PRB prefunding concepts and relationships is to look at the personal timelines of the plan participants. There are three distinct classes of individuals from a conceptual viewpoint: 1) actives not retirement eligible, 2) actives who are retirement eligible and 3) current retirees. All groups include dependents of employees and/or retirees. The current retiree group also includes survivors of deceased retirees. For our evaluation, let's look at three individuals

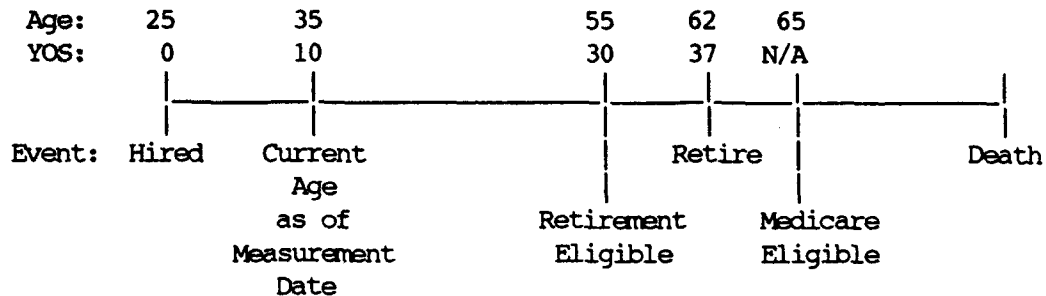
who each fall into one of these distinct groupings. We will assume the retirement eligibility criteria is age 55 with at least 10 years of creditable service, and that the average retirement age is 62. To simplify the number of calculations, the two active individuals are assumed to die at age 78, with the current retiree dying at age 78. The company these employees work(ed) for accounted for PRB on a pay-as-you-go basis up to the beginning of FY 94, when the company plans to transition to prefunding. Therefore the measurement date for the APBO and EPBO concepts is as of 1 Oct 93; the APBO as of the day of the transition from pay-as-you-go to prefunding is the amount that will be amortized over a fixed period of time (20 years is the default time span). The following three individuals -- an active employee not eligible to retire, an active employee who is eligible to retire, and a current retiree-- were selected to best illustrate the manner in which PRB concepts are applied to individual members of the workforce:

Individual A (Active not eligible to retire/refer to Exhibit 3-A) - Under the old method of accounting for PRB, called pay-as-you-go, the costs associated with payment of PRB for this person would have been expensed from age 62 until the individual died. Under the prefunding or accrual method, an actuarially determined present value (PV) of future PRB obligations calculated as of the employee's age as of the measurement date. A portion of this PV obligation, known as the EPBO, is expensed over the employee's attribution period for each accounting period after the transition to prefunding. The past service liability associated with this person as of the transition date from pay-as-you-go to prefunding will be amortized over a fixed period of time which is not related to this particular individual's attribution period. This past service liability, technically known as the APBO or transition obligation, can be conceptualized as the present value of prior service costs from the date of hire to prefunding transition date which would have been incurred if the PRB plan had been prefunded. Remember, an employee's attribution period generally begins when the employee is hired, and ends when the retiree is eligible to retire with an immediate annuity. In this case, the attribution period is between ages 25 and 55, or 30 years. Because the current years of service for this employee is 10, we know that 10 divided by 30, or one-third of the EPBO for this person at the present time is attributable to past service, with two-thirds of the EPBO allocated to future service. For each year between age 35 and age 55, 1/30th of the PRB liability at retirement will be accrued each year as a service or normal cost. If this individual is laid off in FY 94, the resulting PRB liability would be zeroed out because eligibility requirements for PRB were not met.

EXHIBIT 3-A

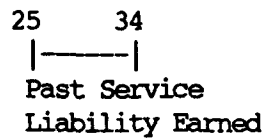
TIMELINE FOR INDIVIDUAL A

-----< Participant Information >-----
 Individual A (Active not eligible to retire)
 (AGE: 35 Sex: M Current Years of Service (YOS): 10)

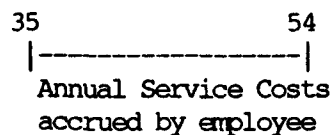


SFAS 106 Concepts:

(Age timelines)



35
 | :::> APBO (past service liability
 as of transition
 date; is amortized
 over fixed period)



35
 | :::> EPBO (total
 PRB liability as of
 measurement date; is
 used to calculate
 APBO and service cost;
 NOT an explicit cost
 element.

Present Value as of measurment date equals EPBO	{	62	-----
	{	FRB Benefits paid out of PRB trust (NOT a contractual cost)	

Individual B (Active eligible to retire/ refer to Exhibit 3-B) - The attribution period for this person was between the ages of 33 and 55. Because this individual's current age is 58, all accruals for PRB should already have been made. This means that 100 percent of this individual's PRB liability is attributable to past service, and none is attributable to future service. The APBO and EPBO for this individual will therefore be equal. The EPBO for this individual is the PV of future benefits at age 58. If this individual is laid off, the APBO would not go to zero as with Individual A, but would actually increase. This would be as a result of this person taking early retirement - at age 58 rather than at age 62 as previously planned - upon being laid off. The PRB liability associated with retirement at age 58 versus age 62 will increase because of an additional 4 years of retirement benefits and because shifting retirement up 4 years will result in a higher present value due to the time value of money. It is important to note that the additional costs incurred because of early retirement (age 58 to 62) are in the high-cost pre-Medicare years.

Individual C - (Current Retiree/ refer to Exhibit 3-C) - This individual, unlike the prior two, is a current retiree. All of this individual's earned benefits are attributable to past service. Like individual B who was retirement eligible, the APBO and EPBO for a current retiree are equal. The EPBO represents the present value of future PRB benefits at the retiree's current age. No service costs are associated with current retirees. A current retiree's liability (i.e. cost or obligation) will not be impacted by reductions-in-force. This particular retiree's EPBO present value includes two years (age 64 and 64) benefits before he becomes Medicare eligible.

General Note: The time value of money must always be considered when the APBO and EPBO are calculated. Both concepts are tied to a specific measurement date, and will change from year to year based on the time value of money concept. For example, the obligations for Individual A at age 35 will be different than the obligations at age 36, because the present value of retirement benefits will be discounted one period less at age 36.

Estimating Future Benefits

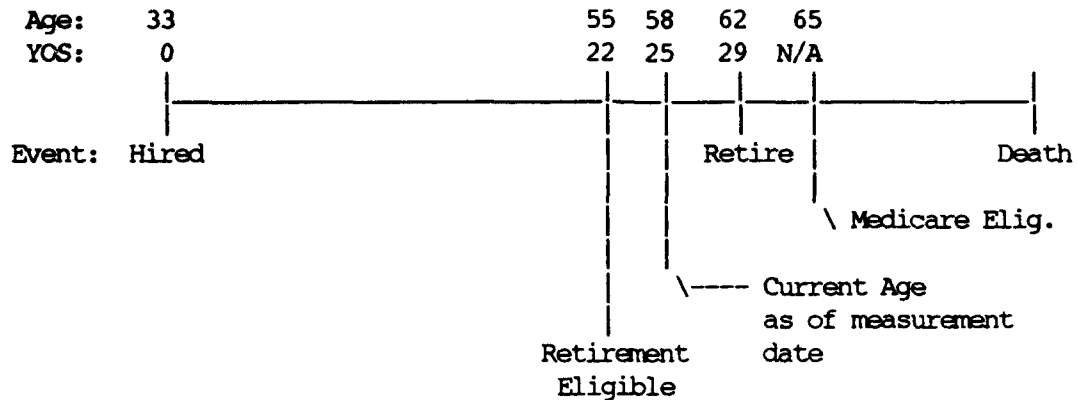
The first step in estimating PRB obligations and costs is to estimate the future cash flow of benefits. This benefit estimate is important for several reasons. First, the present value of the benefit cash stream is equal to the PRB obligations (e.g. the APBO and EPBO). Secondly, while benefit outlays are no longer a

EXHIBIT 3-B

TIMELINE FOR INDIVIDUAL B

-----< Participant Information >-----

Individual B (Active, eligible to retire)
(Age: 58 Sex: F Current Years of Service (YOS): 25)



SFAS 106 Concepts:

(Age Timelines)



58
| :::> APBO (past service liability as of transition date; amortized over-time

58
| :::> EPBO (total PRB liability as of measurement date; is used to calculate APBO and service cost; NOT an explicit cost element.

Present Value as of retirement date equals EPBO { 62
|-----|
PRB Benefits paid out of PRB trust (NOT a contractual cost)

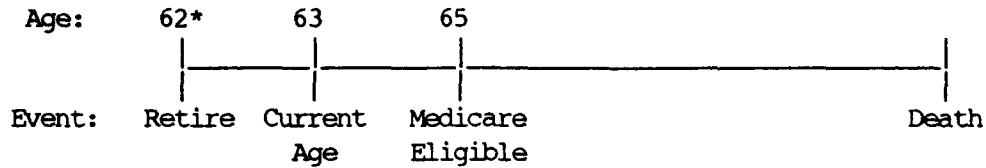
EXHIBIT 3-C

TIMELINE FOR
INDIVIDUAL C

-----< Participant Information >-----

Individual C (Current Retiree)

Age: 63 Sex: M Years of Service: N/A)



SFAS 106 Concepts:

(Age Timelines)

63

| :::> APBO (past service liability as of transition date; amortized over-time.

63

| :::> EPBO (total PRB liability as of measurement date; is used to calculate APBO and service cost; NOT an explicit cost element.

Present Value { 63
equals EPBO { |-----|
Benefit Payouts (not a contractual cost)

* past service liability earned before retirement at age 62.

contractual expense under the prefunding concept, estimated benefits are still needed to calculate other components of the prefunding contribution.

To recap the major assumptions used in these examples, the contractor will transition from pay-as-you-go accounting to prefunding as of 1 Oct 93. Prefunding costs are calculated for FY 94. An 8.0 percent discount rate is assumed. The retirement age is assumed to be age 62. Employees are qualified to receive PRB at age 55 with at least 10 years of creditable service.

Future benefit costs are generally estimated on a per person basis. A census of the population provides the actuary with the numbers of individuals at each age, their sex, and the number of years of service (YOS) for active employees. The census is further divided into active employees and current retirees. Sometimes participant information is available for dependents of retirees; other times it is not. If detailed census information is not available for dependents, some broad-based assumptions must be used; for example, 60 percent of males are assumed to be married at retirement, and their spouses are 4 years younger than the retiree. Based on this assumption, if 10 males retire in FY 94 at age 62, we have to include 6 female dependents at age 58 in our valuation. To simplify the following examples, no dependents have been included for the three individuals under consideration.

The actuary takes this participant information and combines it with economic and actuarial assumptions to project the future benefit stream for each individual. Exhibits 4-A, 4-B, and 4-C describe how the various assumptions are combined to arrive at the "Expected PRB Benefit". The "Expected PRB Benefit" assumes the individual remains working for the contractor, and does not die or be terminated between the individual's age in FY 94 and the anticipated retirement age. The probability that the employee will die or be terminated between his current age (as of the valuation measurement date) and the retirement date is known as the "Survival Factor" (refer to Exhibits 6-M and 6-F for details), and is calculated separately from the "Expected PRB Benefit".

The key assumptions used to estimate future benefits are per capita PRB cost, medical inflation, the impact of aging on the population, and mortality. Each of these assumptions will be covered in more detail in the next section of this paper. Please note that the cumulative survival column (7) in Exhibit 4-A/B/C begins at one (1.0000) for the first year of the projection because we are assuming at this stage of the analysis that all current employees survive in service until retirement. After the first year, cumulative survival is calculated as the previous year's survival times the probability the retiree died in the intervening year ("Prob. Survive to Next Age" - see column 6). The cumulative survival column is simply the cumulative product of all previous mortality factors from column 6. Column 6 is based

EXHIBIT 4-A

Example of How
Future Benefit Outlays are Estimated.
for Individual A

Derivation of Estimate:

Per Capita PRB Cost Factor FY94 \$

(1) a. Pre-Medicare 3834
b. Post-Medicare 1234

FY AGE	(2) Cost Trend Annual Esc	(3) Cost Trend Compound	(4) Aging Factor Calculation	(5) Aging Factor	(6) Prob. Survive to next age	(7) Cumulative Survival	(8) Expected PRB Benefit
21 62	1.06	6.7137	$1/(1.025^{64-62})$	0.9518	0.98763	1.00000	24,500
22 63	1.06	7.1165	$1/(1.025^{64-63})$	0.9756	0.98623	0.98763	26,290
23 64	1.06	7.5435	$1/(1.025^{64-64})$	1.0000	0.98459	0.97403	28,171
24 65	1.06	7.9961	$1/(1.035^{73-65})$	0.7594	0.98268	0.95902	7,186
25 66	1.06	8.4759	$1/(1.035^{73-66})$	0.7860	0.98047	0.94241	7,747
26 67	1.06	8.9845	$1/(1.035^{73-67})$	0.8135	0.97800	0.92400	8,334
27 68	1.06	9.5235	$1/(1.035^{73-68})$	0.8420	0.97530	0.90367	8,942
28 69	1.06	10.0949	$1/(1.035^{73-69})$	0.8714	0.97243	0.88135	9,568
29 70	1.06	10.7006	$1/(1.035^{73-70})$	0.9019	0.96941	0.85705	10,207
30 71	1.06	11.3427	$1/(1.035^{73-71})$	0.9335	0.96627	0.83083	10,856
31 72	1.06	12.0232	$1/(1.035^{73-72})$	0.9662	0.96292	0.80281	11,508
32 73	1.06	12.7446	$1/(1.035^{73-73})$	1.0000	0.95924	0.77304	12,158
33 74	1.06	13.5093	$1/(1.035^{73-74})$	1.0350	0.95512	0.74154	12,794
34 75	1.06	14.3199	$1/(1.035^{73-75})$	1.0712	0.95045	0.70826	13,407
35 76	1.06	15.1790	$1/(1.035^{73-76})$	1.1087	0.00000	0.67316	13,980
36 77	1.06	16.0898	$1/(1.035^{73-77})$	1.1475	0.00000	0.00000	0

EXHIBIT 4-A (Continued)

Assumptions and Calculations Used to Estimate
PRB Benefits for Individual A

Assumptions:

<u>Participant Information (census as of 1 Oct 93)</u>	<u>Cost Trend</u>
Male active employee, aged 35 in FY94. For simplification, assumes dies at age 77. Assume retires at age 62.	Assumed to begin at 14 percent in FY 94, trending down to 6 percent annually in one percent increments.
<u>Aging Factors</u>	<u>Mortality Table</u>
Average age of pre-Medicare group is 64. Average age of post-Medicare group is 73. Medical costs increase 2.5% per year for people under age 65 and 3.5% per year for individuals over age 65.	1983 Group Annuity Mortality Table. <u>Per Capita Costs</u> See outlined box on previous page.

Notes on Calculations:

Column 1 - Per Capita Cost Factors. Are based on historical data.
Column 2 - Annual escalation rates as described in the assumption section.
Column 3 - Product of annual escalation rates from the base year (FY 94)
Column 4 - Calculated as 1 divided by annual aging factor raised to the power equal to average age of group less participant's age in current fiscal year)
Column 5 - Results of column 4 calculations.
Column 6 - Taken directly from mortality table.
Column 7 - Begins at probability of survival equals one, because we assume here that individual lives to retire at age 62. Annual probability are products of previous year's probability of survival times the probability individual dies at the current year; for example, Probability survive to age 70 equals probability survive to age 69 times the prob. the individual dies between age 69 and 70, which is equal to 0.88135 x 0.97243 or 0.85705
Column 8 - Product of Cost Factor (1) x Column (3) x Column (5) x Column (7)

EXHIBIT 4-B

Example of How
Future Benefit Outlays are Estimated.
for Individual B

Derivation of Estimate:

Per Capita PRB Cost Factor	FY94	\$
(1) a. Pre-Medicare	3834	
b. Post-Medicare	1234	

FY AGE	(2) Cost Trend Annual Esc	(3) Cost Trend Compound	(4) Aging Factor Calculation	(5) Aging Factor	(6) Prob. Survive to next age	(7) Cumulative Survival	(8) Expected PRB Benefit
98 62	1.10	1.6015	1/(1.025^64-62)	0.9518	0.99421	1.00000	5,844
99 63	1.09	1.7616	1/(1.025^64-63)	0.9756	0.99359	0.99421	6,551
00 64	1.08	1.9202	1/(1.025^64-64)	1.0000	0.99291	0.98784	7,272
01 65	1.07	2.0738	1/(1.035^73-65)	0.7594	0.99215	0.98083	1,906
02 66	1.06	2.2190	1/(1.035^73-66)	0.7860	0.99131	0.97313	2,094
03 67	1.06	2.3521	1/(1.035^73-67)	0.8135	0.99035	0.96468	2,278
04 68	1.06	2.4932	1/(1.035^73-68)	0.8420	0.98922	0.95537	2,475
05 69	1.06	2.6428	1/(1.035^73-69)	0.8714	0.98787	0.94507	2,686
06 70	1.06	2.8014	1/(1.035^73-70)	0.9019	0.98624	0.93361	2,911
07 71	1.06	2.9695	1/(1.035^73-71)	0.9335	0.98430	0.92076	3,150
08 72	1.06	3.1476	1/(1.035^73-72)	0.9662	0.98205	0.90630	3,401
09 73	1.06	3.3365	1/(1.035^73-73)	1.0000	0.97947	0.89003	3,664
10 74	1.06	3.5367	1/(1.035^73-74)	1.0350	0.97657	0.87176	3,938
11 75	1.06	3.7489	1/(1.035^73-75)	1.0712	0.97334	0.85133	4,219
12 76	1.06	3.9738	1/(1.035^73-76)	1.1087	0.00000	0.82863	4,505
13 77	1.06	4.2123	1/(1.035^73-77)	1.1475	0.00000	0.00000	0

EXHIBIT 4-B (Continued)
Assumptions and Calculations Used to Estimate
PRB Benefits for Exhibit 4-B

Assumptions:

<u>Participant Information (census as of 1 Oct 93)</u>	<u>Cost Trend</u>
Female active employee, age 58 in FY94. For simplification, assumes dies at age 77. Assume retires at age 62. Currently retirement eligible.	Assumed to begin at 14 percent in FY 94, trending down to 6 percent annually in one percent increments.
<u>Aging Factors</u>	<u>Mortality Table</u>
Average age of pre-Medicare group is 64. Average age of post-Medicare group is 73. Medical costs increase 2.5% per year for people under age 65 and 3.5% per year for individuals over age 65.	1983 Group Annuity Mortality Table. <u>Per Capita Costs</u> See outlined box on previous page.

Notes on Calculations:

- Column 1 - Per Capita Cost Factors. Are based on historical data.
- Column 2 - Annual escalation rates as described in the assumption section.
- Column 3 - Product of annual escalation rates from the base year (FY 94)
- Column 4 - Calculated as 1 divided by annual ageing factor raised to the power equal to average age of group less participant's age in current fiscal year)
- Column 5 - Results of column 4 calculations.
- Column 6 - Taken directly from mortality table.
- Column 7 - Begins at probability of survival equals one, because we assume here that individual lives until retire at age 62. Annual probability are products of previous year's probability of survival times the probability individual dies at the current year; for example,
 Probability survive to age 70 equals probability survive to age 69 times the prob.
 the individual dies between age 69 and 70, which is equal to 0.94507×0.98787 or 0.93361
- Column 8 - Product of Cost Factor (1) x Column (3) x Column (5) x Column (7)

EXHIBIT 4-C

Example of How
Future Benefit Outlays are Estimated
for Individual C

Derivation of Estimate:

Per Capita PRB Cost Factor	FY94	\$
(1) a. Pre-Medicare	3834	
b. Post-Medicare	1234	

FY AGE	(2) Cost Trend Annual Esc	(3) Cost Trend Compound	(4) Aging Factor Calculation	(5) Aging Factor	(6) Prob. Survive to next age	(7) Cumulative Survival	(8) Expected PRB Benefit
94 63	1.1400	1.0000	1/(1.025^64-63)	0.9756	0.98623	1.00000	3,740
95 64	1.1300	1.1400	1/(1.025^64-64)	1.0000	0.98459	0.98623	4,311
96 65	1.1200	1.2882	1/(1.025^64-65)	1.0250	0.98268	0.97104	1,582
97 66	1.1100	1.4428	1/(1.035^73-66)	0.7860	0.98047	0.95421	1,335
98 67	1.1000	1.6015	1/(1.035^73-67)	0.8135	0.97800	0.93558	1,504
99 68	1.0900	1.7616	1/(1.035^73-68)	0.8420	0.97530	0.91499	1,675
00 69	1.0800	1.9202	1/(1.035^73-69)	0.8714	0.97243	0.89239	1,843
01 70	1.0700	2.0738	1/(1.035^73-70)	0.9019	0.96941	0.86778	2,003
02 71	1.0600	2.2190	1/(1.035^73-71)	0.9335	0.96627	0.84124	2,150
03 72	1.0600	2.3521	1/(1.035^73-72)	0.9662	0.96292	0.81287	2,280
04 73	1.0600	2.4932	1/(1.035^73-73)	1.0000	0.95924	0.78273	2,408
05 74	1.0600	2.6428	1/(1.035^73-74)	1.0350	0.95512	0.75083	2,534
06 75	1.0600	2.8014	1/(1.035^73-75)	1.0712	0.95045	0.71713	2,656
07 76	1.0600	2.9695	1/(1.035^73-76)	1.1087	0.94512	0.68160	2,769
08 77	1.0600	3.1476	1/(1.035^73-77)	1.1475	0.00000	0.64419	2,871
09 78	1.0600	3.3365	1/(1.035^73-78)	1.1877	0.00000	0.00000	0

EXHIBIT 4-C (Continued)
Assumptions and Calculations Used to Estimate
PRB Benefits for Individual C

Assumptions:

<u>Participant Information (census as of 1 Oct 93)</u>	<u>Cost Trend</u>
Male current retiree, aged 63 in FY94. For simplification, assumes dies at age 78.	Assumed to begin at 14 percent in FY 94, trending down to 6 percent annually in one percent increments.
<u>Aging Factors</u>	<u>Mortality Table</u>
Average age of pre-Medicare group is 64. Average age of post-Medicare group is 73. Medical costs increase 2.5% per year for people under age 65 and 3.5% per year for individuals over age 65.	1983 Group Annuity Mortality Table. <u>Per Capita Costs</u> See outlined box on previous page.

Notes on Calculations:

Column 1 - Per Capita Cost Factors. Are based on historical data.
Column 2 - Annual escalation rates as described in the assumption section.
Column 3 - Product of annual escalation rates from the base year (FY 94)
Column 4 - Calculated as 1 divided by annual aging factor raised to the power equal to average age of group less participant's age in current fiscal year)
Column 5 - Results of column 4 calculations.
Column 6 - Taken directly from mortality table.
Column 7 - Begins at probability of survival equals one, because census as of 1 Oct 93 has identified individual is living at age 63. Annual probability are products of previous year's probability of survival times the probability individual dies at the current year; for example, Probability survive to age 70 equals probability survive to age 69 times the prob. the individual dies between age 69 and 70, which is equal to 0.89239 x 0.97243 or 0.86778
Column 8 - Product of Cost Factor (1) x Column (3) x Column (5) x Column (7)

on a specific mortality table used in the valuation; the probability of survival is one minus the probability of death at a given age. Special note should also be made of the aging assumption. Ideally, this assumption would not be required because there would be sufficient cost data to break historical benefit costs into various age bands (e.g. age 51 to 55, age 56 to 60). However, sometimes the retiree population is too small, or the contractor's claim administrator does not keep records by age. In this case an escalation factor like the one here is used, which assumes the aging factor is set to 1.000 at the average age of the population, and is adjusted up and down from this point based on ages of individual members of the population.

Calculating PRB Obligations and Service Costs

Once future benefit outlays have been estimated, the cash streams can be discounted to find the total PRB obligation at a particular point in time, generally the year of the valuation (e.g. the measurement date). To review, the EPBO (Expected Postretirement Benefit Obligation) is the actuarial present value of benefits the contractor faces for a employee (including dependents) as of a given measurement date, while the APBO (Accumulated Postretirement Benefit Obligation) is that portion of the EPBO which is attributable to past service as of the valuation date. Service costs are that portion of the EPBO which is attributed to the current accounting period, e.g. that portion of future benefits which are earned by the employee in the current period.

Exhibits 5-A, 5-B and 5-C illustrate how the PRB obligations are estimated for 3 individuals. It is important to remember that the EPBO and the APBO are identical for Individuals B and C because all of their obligations are attributable to past service. Individual B is retirement eligible, so the attribution period would have ended at age 55. No service costs would be associated with B after age 55. The same is true of Individual C, who is a current retiree. Individual A, however, is an active employee who is not retirement eligible. This individual's APBO will be less than the EPBO, because the employee has only earned a portion of his future benefits.

The first step towards estimating a PRB obligation for an individual is to find the present value of "Expected PRB Benefits". For individual A, this total present value amount is \$14,596. However, this can not be directly used as the EPBO because we have not considered the impact of mortality and terminated employment between the current age of 35 in FY 94, and the time the employee retires at age 62. To account for the time span from age 35 to age 62, we apply a Survival Factor (see below for details) for a current employee at age 35, which is taken from the last column of Exhibit 6-M. The total present value of benefits multiplied by the survival factor yield the EPBO for this employee, which is calculated as $\$14,596 \times .27 = \$3,883$.

EXHIBIT 5-A

EXAMPLE OF HOW PRB OBLIGATIONS AND SERVICE COSTS ARE ESTIMATED for INDIVIDUAL A

VITAL STATISTICS - Given

94 :FY of Valuation (e.g. Measurement Date)	
35 :Individual Age at Measurement Date (e.g. FY94)	
M:Sex	
25 :Age Individual Hired	
55 :Age Individual is Retirement Eligible	
62 :Retirement Age Assumption	

VITAL STATISTICS - Calculated

10 :Years of Service (YOS) in FY94 (= 35-25)	
30 :YOS when Retirement Eligible (= 55-25)	
0.2660 :Survival Factor (for M aged 35)	
0.33 :Past Service Factor (= 10/30)	

FIND PRB Obligation

Total Discounted Cost-FY94	16,569
MULTIPLY by Survival Factor	* 0.27
EPBO as of FY 94	4,407
MULT by Past Service Factor	* 0.33
APBO as of FY 94	1,469

FIND Service Cost

EPBO as of FY 94	4407
Divide by YOS credited year are Retirement Eligible	30
Service Cost as of FY 94	147

— Present Value at Measurement FY —

FY	AGE	Expected PRB Benefit	Discount Factor	Discounted Benefit	NOTES:
21	62	24,500	1/1.08 ⁶² (62+.5-35)	2,951	Must discount between age at measurement date, and retirement age; e.g 62-35 = 27 yrs. to find PV of PRB at age 35
22	63	26,290	1/1.08 ⁶³ (63+.5-35)	2,932	
23	64	28,171	1/1.08 ⁶⁴ (64+.5-35)	2,909	
24	65	7,186	1/1.08 ⁶⁵ (65+.5-35)	687	Discount Rate is 8.0%, using midyear factors.
25	66	7,747	1/1.08 ⁶⁶ (66+.5-35)	686	
26	67	8,334	1/1.08 ⁶⁷ (67+.5-35)	683	
27	68	8,942	1/1.08 ⁶⁸ (68+.5-35)	679	This individual is a current active employee, so a portion of the EPBO is due to past service, and the rest is due to future service. The service cost is the current period's PRB accrual. The survival factor is from a table for male actives; see separate exhibit.
28	69	9,568	1/1.08 ⁶⁹ (69+.5-35)	672	
29	70	10,207	1/1.08 ⁷⁰ (70+.5-35)	664	
30	71	10,856	1/1.08 ⁷¹ (71+.5-35)	654	
31	72	11,508	1/1.08 ⁷² (72+.5-35)	642	
32	73	12,158	1/1.08 ⁷³ (73+.5-35)	628	
33	74	12,794	1/1.08 ⁷⁴ (74+.5-35)	612	
34	75	13,407	1/1.08 ⁷⁵ (75+.5-35)	594	
35	76	13,980	1/1.08 ⁷⁶ (76+.5-35)	573	
36	77	0	1/1.08 ⁷⁷ (77+.5-35)	0	
TOTAL DISCOUNTED COSTS AS OF FY94				16,569	

EXHIBIT 5-B

EXAMPLE OF HOW PRB OBLIGATIONS
AND SERVICE COSTS ARE ESTIMATED
for INDIVIDUAL B

VITAL STATISTICS - Given

94 :FY of Valuation (e.g. Measurement Date)
58 :Individual Age at Measurement Date (e.g. FY94)
F:Sex
25 :Age Individual Hired
55 :Age Individual is Retirement Eligible
62 :Retirement Age Assumption

VITAL STATISTICS - Calculated

33 :Years of Service (YOS) in FY94 (= 58-25)
30 :YOS when Retirement Eligible (= 55-25)
0.8064 :Survival Factor (for F aged 58)
1.00 :Past Service Factor (= 33/30)

FIND PRB Obligation

Total Discounted Cost-FY94 26,041
MULTIPLY by Survival Factor * 0.81
EPBO as of FY 94 21,000
MULT by Past Service Factor * 1.00
APBO as of FY 94 21,000

FIND Service Cost

EPBO as of FY 94 N/A
Divide by YOS credited year N/A
are Retirement Eligible N/A
Service Cost as of FY 94 N/A

-- Present Value at Measurement FY --

FY	AGE	Expected PRB Benefit	Discount		Benefit Discounted
			Factor	Equation	
98	62	5,844	0.7073	1/1.08^(62+.5-58)	4,134
99	63	6,551	0.6549	1/1.08^(63+.5-58)	4,290
00	64	7,272	0.6064	1/1.08^(64+.5-58)	4,410
01	65	1,906	0.5615	1/1.08^(65+.5-58)	1,070
02	66	2,094	0.5199	1/1.08^(66+.5-58)	1,089
03	67	2,278	0.4814	1/1.08^(67+.5-58)	1,096
04	68	2,475	0.4457	1/1.08^(68+.5-58)	1,103
05	69	2,686	0.4127	1/1.08^(69+.5-58)	1,108
06	70	2,911	0.3821	1/1.08^(70+.5-58)	1,112
07	71	3,150	0.3538	1/1.08^(71+.5-58)	1,114
08	72	3,401	0.3276	1/1.08^(72+.5-58)	1,114
09	73	3,664	0.3033	1/1.08^(73+.5-58)	1,112
10	74	3,938	0.2809	1/1.08^(74+.5-58)	1,106
11	75	4,219	0.2601	1/1.08^(75+.5-58)	1,097
12	76	4,505	0.2408	1/1.08^(76+.5-58)	1,085
13	77	0	0.2230	1/1.08^(77+.5-58)	0
TOTAL DISCOUNTED COSTS AS OF FY94					26,041

NOTES:

Must discount between age at measurement date, and retirement age; e.g 62-58 = 4 yrs. to find PV of PRB at age 58

Discount Rate is 8.0%, using midyear factors.

This individual is a current active employee eligible to retire as of the measurement date, so all PRB obligations are due to past service; e.g. service cost accrual end if eligibility criteria are met. Survival factors based on calculation made in a separate exhibit.

EXHIBIT 5-BS

**EXAMPLE OF HOW PRB OBLIGATIONS
AND SERVICE COSTS ARE ESTIMATED
for INDIVIDUAL B (Plant Closing)**

VITAL STATISTICS - Given

94 :FY of Valuation (e.g. Measurement Date)
 58 :Individual Age at Measurement Date (e.g. FY94)
 F:Sex
 25 :Age Individual Hired
 55 :Age Individual is Retirement Eligible
 58 :Retire at Plant Shutdown in FY 94

FIND PRB Obligation

Total Discounted Cost-FY94 39,009
 MULTIPY by Survival Factor 1.00
 EPBO as of FY 94 39,009
 MULT by Past Service Factor 1.00
 APBO as of FY 94 39,009

-- Present Value at Measurement FY --

FY	AGE	Expected PRB Benefit	Discount		Discounted Benefit
			Factor	Equation	
94	58	3,119	0.9623	1/1.08^(58+.5-58)	3,001
95	59	3,666	0.8910	1/1.08^(59+.5-58)	3,266
96	60	4,269	0.8250	1/1.08^(60+.5-58)	3,522
97	61	4,926	0.7639	1/1.08^(61+.5-58)	3,763
98	62	5,629	0.7073	1/1.08^(62+.5-58)	3,982
99	63	6,372	0.6549	1/1.08^(63+.5-58)	4,173
00	64	7,142	0.6064	1/1.08^(64+.5-58)	4,331
01	65	1,872	0.5615	1/1.08^(65+.5-58)	1,051
02	66	2,057	0.5199	1/1.08^(66+.5-58)	1,069
03	67	2,237	0.4814	1/1.08^(67+.5-58)	1,077
04	68	2,431	0.4457	1/1.08^(68+.5-58)	1,083
05	69	2,638	0.4127	1/1.08^(69+.5-58)	1,089
06	70	2,859	0.3821	1/1.08^(70+.5-58)	1,092
07	71	3,093	0.3538	1/1.08^(71+.5-58)	1,094
08	72	3,340	0.3276	1/1.08^(72+.5-58)	1,094
09	73	3,599	0.3033	1/1.08^(73+.5-58)	1,092
10	74	3,867	0.2809	1/1.08^(74+.5-58)	1,086
11	75	4,143	0.2601	1/1.08^(75+.5-58)	1,078
12	76	4,425	0.2408	1/1.08^(76+.5-58)	1,065
13	77	0	0.2230	1/1.08^(77+.5-58)	0
TOTAL DISCOUNTED COST AS OF FY94					39,009

NOTES:

Must discount between age at measurement date, and retirement age; e.g 58-58 = 0 yrs. to find PV of PRB at age 58

Discount Rate is 8.0%, using midyear factors.

This individual is a current active employee eligible to retire as of the measurement date, so all PRB obligations are due to past service; if plant shuts down in FY 94, individual will retire immediately. This results in a higher obligation than if assume plant remains open. Survival Factor equals one because individual is living in FY94, which is the year person retires if RIFed.

EXHIBIT 5-C

EXAMPLE OF HOW PRB OBLIGATIONS
AND SERVICE COSTS ARE ESTIMATED
for INDIVIDUAL C

VITAL STATISTICS - Given

94 :FY of Valuation (e.g. Measurement Date)
63 :Individual Age at Measurement Date (e.g. FY94)
MALE:Sex
N/A:Age Individual Hired
N/A:Age Individual is Retirement Eligible
N/A:Retirement Age Assumption

FIND PRB OBLIGATION

Total Discounted Cost-FY94 21,437
MULTIPLY by Survival Factor * 1.00
EPBO as of FY 94 21,437
MULT by Past Service Factor * 1.00
APBO as of FY 94 21,437

VITAL STATISTICS - Calculated

N/A:Years of Service (YOS) in FY94
N/A:YOS when Retirement Eligible
1.0000 :Survival Factor
1.00 :Past Service Factor

FIND SERVICE COST

EPBO as of FY 94 N/A
Divide by YOS credited year N/A
are Retirement Eligible N/A
Service Cost as of FY 94 N/A

-- Present Value at Measurement FY --

FY	AGE	Expected PRB Benefit	Discount Factor	Discounted Benefit
94	63	3,740	1/1.08 ⁶³ (63+.5-63)	3,599
95	64	4,311	1/1.08 ⁶⁴ (64+.5-63)	3,841
96	65	1,582	1/1.08 ⁶⁵ (65+.5-63)	1,305
97	66	1,335	1/1.08 ⁶⁶ (66+.5-63)	1,020
98	67	1,504	1/1.08 ⁶⁷ (67+.5-63)	1,064
99	68	1,675	1/1.08 ⁶⁸ (68+.5-63)	1,097
00	69	1,843	1/1.08 ⁶⁹ (69+.5-63)	1,117
01	70	2,003	1/1.08 ⁷⁰ (70+.5-63)	1,125
02	71	2,150	1/1.08 ⁷¹ (71+.5-63)	1,118
03	72	2,280	1/1.08 ⁷² (72+.5-63)	1,097
04	73	2,408	1/1.08 ⁷³ (73+.5-63)	1,073
05	74	2,534	1/1.08 ⁷⁴ (74+.5-63)	1,046
06	75	2,656	1/1.08 ⁷⁵ (75+.5-63)	1,015
07	76	2,769	1/1.08 ⁷⁶ (76+.5-63)	980
08	77	2,871	1/1.08 ⁷⁷ (77+.5-63)	941
09	78	0	1/1.08 ⁷⁸ (78+.5-63)	0
TOTAL DISCOUNTED COSTS AS OF FY94				21,437

Discount Rate is 8.0%,
using midyear factors.

NOTE:

This individual is a current retiree, so all of the PRB obligation is due to past service (e.g. the APBO = EPBO). We know all current retirees survive til retirement. Costs are discounted back to the age of the retiree as of the prefunding measurement date (age 63)

Once we have calculated the EPBO, we are ready to break-out this value into components representing past service (e.g. APBO) and current service (e.g. the Service or Normal Cost). A Past Service Factor is used to find the APBO. The past service factor is simply the ratio of the years of service (YOS) as of the measurement date to the YOS at the retirement eligibility date. For Individual A this ratio is 10/30 or .33. The APBO is calculated as $\$3,883 * .33 = \$1,294$. The service costs are spread out evenly over the attribution period, which stretches for thirty years from age 25 when the employee was hired to age 55 when the individual is retirement eligible. The FY 94 service cost is the EPBO divided by 30 years, or $\$3,883 / 30$ or \$129.

The PRB obligations for Individuals B and C are calculated in much the same manner. The Past Service Factor for both of these individuals is set to one (1.000), because we know that the EPBO equals the APBO for current retirees and retirement eligibles. No service cost is associated with either of these two individuals. The Survival Factor for Individual C is equal to one, because since he is a current retiree who is on the contractor's census as of 1 Oct 93, we know for certain he has survived to age 63. Individual B, on the other hand, is 58 years old in FY 94, and there is a definite possibility she will die or be terminate between age 58 and retirement at age 62, therefore the survival factor is less than one. The survival factor is based on Exhibit 6-F, and factor is based on the right-side column for a 58 year old.

Exhibit 5-BS recalculates the past service liability for Individual B if a plant shutdown occurs. The APBO would rise from \$21,000 if continued plant operation is assumed to \$39,009 under a shutdown, an almost two-fold increase. This demonstrates the importance individual timelines and actuarial assumptions such as the retirement age have in determining costs.

Survival Factors for Males and Females

Survival factors calculate the probability a current employee dies, is terminated or resigns between the employee's current age and the assumed retirement age. It is composed of two distinct assumptions: 1) a termination assumption and 2) a mortality assumption. The annual survival factor is the product of the probability an individual will survive to the next age and the probability an individual will be terminated before reaching the next age. The cumulative survival factor is set to one (1.000) at the individuals assumed retirement age, and each preceding year is the product of the cumulative survival factor for the next higher age times the next higher age's annual survival factor. Exhibits 6-M and 6-F explain the calculation of the survival factors used in the above examples in some detail.

How Survival Factor is Calculated

for a
Male Active Employee

AGE	(a) (Mortality) Probability of Living for MALES	(b) Termination Probability BOTH SEXES	(c) = 1 - (b) Chance NOT Terminated BOTH SEXES	(a) * (c) Annual Survival Factor	Probability Survive to Retirement
35	0.999045	0.0606	0.9394	0.9385	0.2660
36	0.998992	0.0582	0.9418	0.9409	0.2827
37	0.998927	0.0557	0.9443	0.9433	0.2997
38	0.998846	0.0533	0.9467	0.9456	0.3170
39	0.998747	0.0508	0.9492	0.9480	0.3344
40	0.998625	0.0484	0.9516	0.9503	0.3519
41	0.998478	0.0467	0.9533	0.9518	0.3697
42	0.998303	0.0450	0.9550	0.9533	0.3878
43	0.998095	0.0434	0.9566	0.9548	0.4061
44	0.997853	0.0417	0.9583	0.9563	0.4247
45	0.997574	0.0400	0.9600	0.9577	0.4434
46	0.997255	0.0389	0.9611	0.9585	0.4627
47	0.996900	0.0378	0.9622	0.9593	0.4823
48	0.996513	0.0366	0.9634	0.9600	0.5024
49	0.996097	0.0355	0.9645	0.9607	0.5229
50	0.995657	0.0344	0.9656	0.9614	0.5439
51	0.995196	0.0348	0.9652	0.9606	0.5662
52	0.994717	0.0351	0.9649	0.9598	0.5900
53	0.994222	0.0355	0.9645	0.9589	0.6152
54	0.993711	0.0358	0.9642	0.9581	0.6421
55	0.993188	0.0362	0.9638	0.9572	0.6708
56	0.992647	0.0404	0.9596	0.9525	0.7042
57	0.992068	0.0446	0.9554	0.9478	0.7430
58	0.991423	0.0488	0.9512	0.9430	0.7879
59	0.990685	0.0530	0.9470	0.9382	0.8398
60	0.989825	0.0572	0.9428	0.9332	0.8999
61	0.988818	0.0458	0.9542	0.9436	0.9537
62	0.987630	0.0343	0.9657	0.9537	1.0000

A Note on Derivation

Probability of surviving till retirement begins at 1.00 in retirement year and is the cumulative product of annual survival factors.

For example,

$$\begin{aligned}
 &= 0.4823 * 0.9593 \\
 &= 0.5024 * 0.9600 \\
 &= 0.5229 * 0.9607 \\
 &= 0.5439 * 0.9614 \\
 &= 0.5662 * 0.9606
 \end{aligned}$$

Assumptions Used

Mortality is based on 1983 Group Annuity. Retirement age is 62. Termination rates are as given.

EXHIBIT 6-F

How Survival Factor is Calculated

for a
Female Active Employee

AGE	(a) (Mortality) Probability of Living for FEMALES	(b) Termination Probability BOTH SEXES	(c) = 1 - (b) Chance NOT Terminated BOTH SEXES	(a) * (c) Annual Survival Factor	Probability Survive to Retirement
35	0.999471	0.0606	0.9394	0.9389	0.2857
36	0.999442	0.0582	0.9418	0.9413	0.3036
37	0.999405	0.0557	0.9443	0.9437	0.3217
38	0.999363	0.0533	0.9467	0.9461	0.3400
39	0.999314	0.0508	0.9492	0.9485	0.3584
40	0.999261	0.0484	0.9516	0.9509	0.3769
41	0.999204	0.0467	0.9533	0.9525	0.3957
42	0.999139	0.0450	0.9550	0.9541	0.4147
43	0.999065	0.0434	0.9566	0.9557	0.4340
44	0.998979	0.0417	0.9583	0.9573	0.4533
45	0.998878	0.0400	0.9600	0.9589	0.4727
46	0.998759	0.0389	0.9611	0.9599	0.4924
47	0.998626	0.0378	0.9622	0.9609	0.5125
48	0.998482	0.0366	0.9634	0.9619	0.5328
49	0.998328	0.0355	0.9645	0.9629	0.5533
50	0.998170	0.0344	0.9656	0.9638	0.5741
51	0.998008	0.0348	0.9652	0.9633	0.5959
52	0.997835	0.0351	0.9649	0.9628	0.6190
53	0.997645	0.0355	0.9645	0.9622	0.6433
54	0.997428	0.0358	0.9642	0.9617	0.6689
55	0.997177	0.0362	0.9638	0.9611	0.6960
56	0.996886	0.0404	0.9596	0.9566	0.7275
57	0.996552	0.0446	0.9554	0.9521	0.7641
58	0.996175	0.0488	0.9512	0.9476	0.8064
59	0.995754	0.0530	0.9470	0.9430	0.8552
60	0.995288	0.0572	0.9428	0.9384	0.9114
61	0.994775	0.0458	0.9542	0.9493	0.9691
62	0.994211	0.0343	0.9657	0.9601	1.0000

A Note on Derivation

Probability of surviving till retirement begins at 1.00 in retirement year and is the cumulative product of annual survival factors.

For example,

$$\begin{aligned}
 &= 0.5125 * 0.9609 \\
 &= 0.5328 * 0.9619 \\
 &= 0.5533 * 0.9629 \\
 &= 0.5741 * 0.9638 \\
 &= 0.5959 * 0.9633
 \end{aligned}$$

Assumptions Used

Mortality is based on 1983 Group Annuity. Retirement age is 62. Termination rates are as given.

Calculating the Prefunded Contribution

Exhibit 7 demonstrates how the individual PRB obligations, service costs, and benefit outlays are combined to arrive at a prefunding cost for FY 94. The total contribution has four distinct components. Do not confuse the two interest components. Interest on the APBO is necessary because the FAR 31.205-6(o) requires the transition obligation be paid out over time. Interest payments adjust the ABPO (transition obligation) for the passage of time. The interest on the APBO is reduced by the value of benefit payments during the this annual period because these payouts will reduce the contractor's total obligation; benefit payments are assumed to made at a constant rate throughout the fiscal year, so the benefit outlays are factored by 50 percent.

The other interest-related cost component, return on plan assets, is the earnings on the PRB trust plan assets. These earnings reduce the cost of prefunding; it is a credit from the standpoint of the government. Because FY 94 is the first year of prefunding in this example, there are no trust assets at the beginning of the period, so the return on plan assets for the first year is equal to zero. Also, note that the EPBO and benefit outlays are not an explicit cost item. Benefit outlays are payments from the trust plan, and are identical to pay-as-you-go cost before prefunding was adopted. The EPBO is an intermediate concept used to calculate the APBO and the service cost, it is not explicitly included in the final prefunded cost. For these three individuals the amount that would go on contract for PRB prefunding would be \$5,463. This would represent represent a \$1,723 increase over the cost under the pay-as-you-go accounting method.

Exhibit 7

Combining PRB Obligations to find Prefunding Contribution

Prefund Component

APBO - As of Transition Date

Individual A	1,469
Individual B	21,000
Individual C	21,437
TOTAL	43,907

① FIND Amortization of APBO 2,195 (= 43907 / 20)

BENEFIT OUTLAYS - As of Measurement Date

Individual A	0
Individual B	0
Individual C	3,740
TOTAL	3,740

SERVICE COST - As of Measurement Period

Individual A	147
Individual B	N/A
Individual C	N/A
TOTAL	147

FIND Prefunding Contribution

Amortization of APBO ①	2,195
Service Cost ②	147
Interest on APBO ③	3,363
Return on Assets ④	(0)
Total	5,705

② FIND Service Cost 147 (Sum of individual service costs)

③ FIND Interest on APBO 3,363 = (43907 - 3740 * .5) * 0.08

RETURN ON ASSETS - As of Measurement Period

Assets - Begin Period 0

④ FIND Interest on Assets 0 (= 0 * 0.08)

NOTES:

Benefit outlays are not a contractual cost under prefunding, but rather are used to calculate the interest expense.

Return on assets is zero, because FY 93 is first prefunding year. Return on assets reduces the total contribution.

KEY ASSUMPTIONS

Transition Date	1 Oct 93
Measurement Date	Fiscal Year 94
Discount Rate/Return on Plan Assets	0.08 annual
Amortization Period	20 years

Section V

Discussion of Assumptions and Input Data

The magnitude of PRB prefunding costs and obligations depend entirely on the assumptions and census data used in the valuation. During the negotiating process, the government should insure all assumptions used by the contractor are disclosed and their implications understood. Most assumptions can be accepted at face-value by the government, but several key assumptions (primarily the per capita cost development, medical cost trend, and the discount rate) require detailed examination and analysis. Exhibit 8 lists the range of possible assumptions. Not all assumptions will be applicable to a particular valuation. The following sections includes a discussion of the major assumptions used in a typical PRB valuation.

Census Data

Census data is used in actuarial valuations so estimates of liabilities and future costs can be based on specific characteristics of the population. Census information must include the age, sex of all plan participants, as well as creditable years of service of active employees. Information may be provided by individual, or sorted and combined by age. When evaluating census information provided by the contractor it is important to be able to distinctly identify a least three subgroups: active employees (and dependents), current retirees (and dependents), and surviving spouses of current retirees. In addition, it may be necessary to track other distinguishing information about the population, such as union affiliation (benefits may vary by union affiliation) or date of retirement (benefit packages may be scaled back for retirees after a certain date). Census data should be relatively current, and reflect the current population makeup (e.g. no major reduction-in-force actions taking place after the census). If the contractor has used a pension database for PRB purposes, the government analyst should make sure all pensioners are eligible for PRB.

Certain terminology which describes participant's status should be kept in mind when evaluating a contractor proposal or census listing. Retiree medical plans can include either family or single coverage. The spouse is generally referred to as a dependent. A deceased dependent who continues to receive medical benefits is known as a surviving spouse (or sometimes as a beneficiary). A certain percentage of retirees will have dependent coverage; surviving spouses will have no dependent coverage (because they are the dependent). Sometimes, contractors will lump-together dependents and survivors along with current retirees in a category called simply "retirees".

EXHIBIT 8

PRB Acturial Assumptions

- a. Administrative expense
- b. Age- and Sex-specific morbidity
- c. Age- and Sex-Specific mortality
- d. Availablity of primary coverage from alternative sources.
- e. Benefit changes after, retirement, death or disability
- f. Disability retirement
- g. Employee, retiree, and survivor contributions
- h. Employment age
- i. Employment levels
- j. Family composition after retirement, death or disability
- k. General Economic Inflaton (e.g. Consumer Price Index)
- l. Health care cost trend
- m. Investment return and rate for discounting projected benefit costs, including income tax implications
- n. Involuntary terminaton of participant
- o. Leaves, layoffs, transfers, and reinstatements
- p. Marriage, remarriage, and divorce
- q. Medicare and other government-provided benefits
- r. New entrants
- s. Retiree and survivor withdrawl due to participant discontinuation of required contributions
- t. Retiree election of optional benefit plans
- u. Retiree election of optional health care delivery systems
- w. Salary changes
- x. Voluntary termination of participant

Source: Actuarial Standard of Practice No. 6, Measuring and Allocating Actuarial Present Values of Retiree Health Care and Death Benefits

Care should be taken to ensure there is no misunderstanding on which participants a contractor has included in a total population number.

Per Capita Cost Development

Per capita costs are used as baseline values to project future medical costs. This is perhaps one of the simplest concepts to understand in the PRB arena, but one of most difficult in practice to "get right". This difficulty is partially the result of a host of possible methodologies to use, and partially due to lack of reliable historical data. Per capita costs can be based on nation-wide averages, although use of actual cost experience is preferred. For example, the U.S. Chamber of Commerce publishes average medical costs annually, by industry type, for all participants (active and retired) (reference 1992 Employee Benefits Report, Table 8 - Employee Benefits as Dollars per Year per Employee, by type of Benefit and Industry Groups, 1991). Costs of pre- and post-Medicare coverage are not separately identified. This type of nation-wide average cost may have to be used if a contractor's retiree population is too small to be statistically valid. Generally, to use historical contractor-specific data, the retiree population should be 300 or higher.

The preferred data source for per capita costs is actual plan experience. Historical cost data should be based on government reimbursements by accounting period (data is generally kept on a calendar year (CY) basis) for retiree medical claims. Cost provided should be a net of employee contributions and include applicable administrative fees. Insure that cost data only includes reimbursements of actual claims, and does not include costs associated with plan reserves.

Total reimbursable costs are divided by the average number of participants during a period to arrive at a per capita (e.g. per person) cost. The average number of participants (sometimes referred to as the average covered population) is generally derived as the average of the beginning and end of period populations.

If the contractor (i.e. accounting segment) has a relatively small population, serious thought should be given to using a multi-year average of pay-as-you-go medical claims. Using one year's experience for a small population may skew total costs, because a few major illnesses could result for a significant portion of total costs.

In order to normalize current year historical claims to a specific base year, a cost trend must be applied. Generally, the cost trend would be applied to escalate costs from the midpoint of the historical cost period (sometimes referred to as the experience period) to the midpoint of the base year, which is

the year of the actuarial valuation. If a multi-year experience period has been used, it is suggested trending be done for from the midpoint of each annual period, rather than from the midpoint the total experience period. Use of an experience period longer than three years may create difficulties because medical plan benefits may change periodically, or reductions in force have distorted costs for certain periods. This will reduce the chances of distortions due to different trends during the period. See the "medical trend section" for a specific discussion of medical inflation and trends.

Generally, per capita costs are developed on a per person basis, but some actuaries may prefer to develop costs on a per retiree unit basis instead. In this case, a retiree unit is defined as a family which is headed by a retiree or spouse, and may have a dependent. Per unit costs will reflect a family or unit size of greater than one person (e.g. if there are half as many dependents as retirees and survivors, then the retiree unit will include 1.5 people on average. This approach should provide a reasonable estimate of PRB costs, as long as the projected population characteristics are consistent with the manner in which per unit costs were developed. However, it is suggested per capita medical costs be developed on a per person basis, which is easier to conceptualize and less open to misinterpretation.

Based on AMCCOM experience, medical plan administrators generally do not keep records by age of retirees (or perhaps records are kept by retiree age, but dependent records are not separately grouped by age), so breakouts between pre- and post-Medicare populations are difficult. If no detailed historical data exists on pre- and post-65 experience, the following equation can be used (it assumes that post-65 costs are 30 percent of pre-65 costs):

Assumptions

Pre-M% = Percentage of retiree population that is pre-Medicare
Pos-M% = Percentage of retiree population that is post-Medicare
Assume know overall per capita average cost is known.

Equation

Pre-M% * Pre-Medicare Cost +
+ Pos-M% * 30% * Pre-Medicare Per Capita = Overall per capita average (for all ages)

Solve for Pre-Medicare cost; post-Medicare cost is 30% of the pre-medicare cost.

Another potential issue is segmentation of costs for

contractors who have more than one GOCO segment. The contractor may propose that a PRB valuation be done for all segments together, and the total cost be allocated to individual segments on a head count basis. In this case, the actual cost experience at an individual plant will be averaged with other segments. Because the cost-beneficial relationship is undermined by this approach, the Defense Contract Audit Agency (DCAA) and the Defense Logistics Agency (DLA) prefer that costs be fully segmented, with valuations performed for each GOCO segment separately.

Medical Cost Trend (Inflation)

The medical cost trend assumption is one of the most important assumptions, and may be a point of controversy during negotiations. The trend has a tremendous cost impact because medical inflation in the United States has been dramatically higher than the general inflation rate. Often the broader term "cost trend" is used instead of inflation. Other factors besides medical inflation which are included in the cost trend are increased utilization of medical services and cost increases arising from new technologies.

There is no ready-made DoD guidance on the preferred medical cost trend to use in a PRB valuation. In the past, HQ, AMCCOM, has negotiated medical trends which start trending at levels equal to recent historical experience for the economy as a whole. This historical data can be obtained from U. S. Chamber of Commerce Employee Benefits Report by calculating the rate of increase between subsequent year reports; for instance:

	Per Capita Basis (Current \$s)		
	<u>1990</u>	<u>1991</u>	<u>Trend</u>
Medical and Medically Related Benefit Payments (Employer's Share Only) (Total, All Industries)	\$3,179	\$3,465	8.9%

Care should be taken when using this data, particularly for a specific industry, because it was compiled by use of surveys, and all data may not be homogeneous.

Another source for obtaining historical medical trends is the Foster Higgins annual survey, which receives wide coverage in business periodicals. The cost trends from the 1992 report are:

	<u>Annual Trend</u>
Traditional fee-for-service plans	14.2%
Health Maintenance Organizations	8.8
Other Preferred Provider Plans	10.5

We can see that attempts to control medical cost growth through HMOs and other preferred provider plans appears to significantly moderate medical cost growth. The approximate annual increases for this survey from 1989 to 1991 for traditional medical plans and HMOs were:

--- Traditional ---			----- HMOs -----		
1989	1990	1991	1989	1990	1991
20.5%	21.5%	13.0%	16.0%	15.5%	13.5%

Clearly, medical cost trends are moderating throughout this period, especially for traditional fee-for-service plans.

Other sources of medical inflation are available, such as the DRI/McGraw Hill Cost and Price Review, can be used. However, these medical forecasts in these tables apparently do not include cost growth due to increased utilization and new technology, so the DRI tables are consistently lower than actual historical survey data collected by the Chamber of Commerce or Foster Higgins. For this reason, contractors would most probably object to using unadjusted DRI tables to forecast medical trends.

While historical data can be used as a starting point to project future medical costs trends, projections will still have to be made for future years. Medical cost models should assume that cost increases will moderate in the out-years, with trends eventually coming in line with overall price increases in the U. S. economy. The medical sector of the national economy currently represents about 15 percent of Gross National Product (GNP), and will continue to increase its share as long as medical cost trends outpace general inflation as measured by such indicators as the Consumer Price Index. Assuming the long-term annual CPI is 4.5%, and the real GNP increases 1.5 percent annually, then the product of these two factors ($1.045 * 1.015 = 1.0607$ or 6.1 percent annually) represents the level at which medical inflation can increase while maintaining a constant share of GNP. The cost trend in any PRB agreement should eventually ramp down to the negotiated long-term assumption in order to demonstrate medical costs will eventually come "under control". If the PRB cost growth is not assumed eventually to be brought under control, an unrealistic situation will develop in that there would not be enough income in the non-medical sector of the American economy to support an ever expanding medical segment.

If the contractor and government are not able to come to agreement on a medical cost trend, one approach to resolve the issue may be to look at the individual components of the cost trend. For example, here are the four components of an medical trend model used by William Mercer, a leading employee benefits consulting firm:

Consumer Price Index
Real GNP

Medicare Cost Shifting
Health Services (Inflation)

The product of the four components are combined into a composite cost trend. This breakout would allow negotiators to understand underlying nature of the trend, and perhaps come to easier agreement on specific components.

Discount Rate

For discount rate is the most important assumption contained in a PRB agreement, and may be the most difficult to reach consensus with the contractor. Unlike internal DoD capital budgeting decisions, the discount rate used in a PRB agreement is subject to a negotiated agreement with the contractor. The SFAS 106 states that the discount rate should be selected "to measure the single amount that, if invested at the measurement date in a portfolio of high quality debt instruments, would provide the necessary future cash flows to pay the accumulated benefits when due." AMCCOM has taken the position that a long term average yield of U.S. Treasury Bonds is the appropriate index to use for selecting a discount rate assumption. In addition, the discount rate should be determined based on the long-term relationship between inflation (as measured by the CPI) and bond yields. By examining bond yields and the CPI together, we can derive the long-term real rate of return on investment. To illustrate using economic data from 1961 to 1992:

Average for Period (up to CY 92)	Bond Yields *	CPI-U Escalation #	Percent Difference
30 year average	7.67	5.30	2.37
25 year average	8.33	5.95	2.38
20 year average	8.95	6.29	2.66
15 year average	9.66	5.81	3.85
10 year average	9.23	3.82	5.41
5 year average	8.40	4.32	4.08

* U.S. Treasury Bond yields, taxable, with maturities of 10 years or more.

Consumer Price Index (CPI) for urban consumers.

(Data from Business Statistics, 1961-91 and Survey of Current Business, Feb 93.)

Based on the 15 year average, the spread between bond yields and the CPI is about 4.0 percent. Therefore, the spread between the long-term CPI assumption used in the medical cost trend and the discount rate should also be about 4 percent. A reasonable projection for the long-term CPI would be 4.0 to 4.5 percent, resulting in an acceptable discount rate of between 8.0 and 8.5 percent. Based on AMCCOM's experience with negotiated discount rates in the FY92/93 timeframe, discount rates of between 8.0 percent and 9.0 percent are reasonable. The recent (early 1993) drop in Treasury Bond yields may result in lower discount rate assumptions for agreements signed in late FY93 or FY 94.

The choice of a discount rate may be influenced by the type of investment vehicle the contractor selects for the PRB trust plan, and by the tax deductibility of plan contributions and earnings. At the outset, PRB prefunding agreements generally assume the long-term return on plan assets is equal to the discount rate. The discount rate should be reevaluated based on changed circumstances at the time of the annual PRB plan valuation.

Contractor's may propose an after-tax discount rate be employed in the PRB valuation. An after-tax discount rate is consistent with private-sector guidance contained in SFAS 106, but conflicts with FAR 31.205-41(b)(1) "Taxes", which disallows most federal income and excise taxes. While use of an after-tax discount rate would not represent an explicit reimbursement of federal income taxes, it certainly would represent an implicit recognition that these costs should be borne by the government, not the contractor. Federal PRB policy has not matured to the point where this issue has been resolved. Very probably AMCCOM would not allow an after-tax discount rate to be employed, unless explicitly required by regulation or directed by higher headquarters. A possible solution would be to explicitly develop taxes as a distinct expense item, so the tax-related costs could be separately identified, and if necessary, disallowed.

Mortality

Mortality tables used by contractors are based on standard industry-wide tables used by the actuarial profession. Mortality tables are organized by sex and age; for instance:

----- Males -----		
Age	qx Yrly Prob. of Dying	px Yrly Prob. of Living
67	.02200	.97800
68	.02470	.97530

The yearly probability of living is simply one minus the yearly probability of dying. The column "px" is the probability of surviving until the next age. For instance a 67 year old man has a 97.8% change of living to age 68. The mortality factors can be multiplied together to obtain probabilities of living for more than one year's time span; for instance the probability a 67 year old man will survive to age 69 is .97800 times .97530 or .95384 (95.4 percent). Tables generally include ages up to 100 or 110. The factors above are taken from the 1983 Group Annuity Mortality Table for Males. Some actuarial tables are called "life" tables, and are used to calculate life insurance premiums. A "life" table is conservative in that it assumes people die early. A "group mortality" table is used for pension valuations and is conservative in that it assumes people will tend to live longer.

Typically contractors will use the pension plan's group mortality table as the basis for the PRB valuation. AMCCOM in the past has accepted the contractor's proposed mortality tables, because there was no valid reason to challenge the mortality assumption.

Other Assumptions

Employee Terminations - This assumption is used to calculate the survival factor for active employees. Terminations are generally given in 5 year age bands, either as percentage of employees terminated, or as terminations per 10,000 employees. The probability of not being terminated is one minus the probability of being terminated. Terminations are for any other reason besides retirement or death, and can be either voluntary or involuntary. Terminations are higher for younger employees, and will decrease for older employees. Contractors may use the same termination assumption as used in the pension valuation. AMCCOM has found no reason to challenge a contractor's proposal on this issue.

Retirement Rates - Generally contractors will assume employees retire over a range of ages, for instance 55 to 70. The percent retiring at each age is calculated based on historical personnel data. For example,

Retirement Age	Rate
55	8.2 %
56	6.6
57	6.4
.	.
.	.
.	.
70	1.4

	100.0 %

PRB obligations are calculated as the weighted average of the present values for each retirement age assumption. The retirement rate assumption used in the previous section of this paper is a simplification.

Generic Dependent Assumptions - Because detailed census information is oftentimes unavailable for the dependents of retirees and active employees, general assumptions are made about this group. For instance, one may assume 60% of current retirees have spouse coverage, while 65 percent of future retirees will have dependent coverage. In addition, it is generally assumed males are on average four years older than their spouse, and visa versa. These types of generalized assumptions are acceptable so long as they approximately mirror the actual population of dependents.

Plant Shutdown - Most actuarial prefunding valuations assume the plant will continue to operate, and exclude the cost impact on PRB obligations of future layoffs. A separate valuation would be generally be performed to determine a contractor's liability after a plant shutdown.

Medicare Cost Shifting- This refers to the tendency of hospitals and other medical care providers to shift loss of revenue, caused by Congressional limitations on Medicare-approved reimbursement schedules, onto the shoulders of private corporations and insurance carriers. While this is a valid element of the total cost trend, it is somewhat speculative in that it is impossible to predict the future actions of Congress. AMCCOM has been very skeptical in accepting any Medicare cost shifting assumption. However, AMCCOM has negotiated a PRB agreement with one contractor which contains cost shifting as a component of the overall cost trend; the trend begins at 3.5 percent in CY 90, and trends down to zero in CY 17.

Leveraging - Leveraging is defined as the cost impact of fixed dollar deductibles and participant contributions having a lower constant dollar value in future accounting periods due to the impact of medical inflation. It is usually included in an actuarial valuation as an increase in the cost trend. This is a somewhat difficult assumption to get a handle on, and any contractor proposal in this regard should be examined very closely. If deductibles and participant contributions are linked to medical inflation, no leveraging assumptions would be necessary. An example of leveraging if a contractor has a \$200 fixed deductible and an average claim of \$1000 in FY 94 dollars:

	(1)	(2)	(3)	(4)	(4) - (1)
FY	Medical Trend	\$1000 claim	Contractor Cost after \$200 Ded.	Cost Trend	Leveraging Factor
94	15.0%	\$1000	\$800	18.8%	3.8%
95	14.0%	1150	950	16.9%	2.9%

The impact of leveraging has increased the contractor's cost trend by 3.8 percent in FY 94, and 2.9 percent in FY 95.

Section VI

PRB Case Study Ravenna AAP Prefunding Agreement

This section will discuss a negotiated prefunding agreement AMCCOM has entered into with Ravenna Arsenal Inc. (RAI, an Olin subsidiary), the Ravenna AAP operating contractor. Ravenna is an inactive plant located in Ohio. The contractor requested an accounting change from pay-as-you-go to prefunding as of 1 Oct 92, with FY 93 being the first fiscal year under prefunding. Due to DoD downsizing initiatives, Ravenna has been removed from the mobilization base, and its mission will change from an inactive operating and maintenance (O&M) contract to a Modified Caretaker contract as of 1 Oct 93. A solicitation is currently being conducted for the new contract. In addition, the AMCCOM legal office issued an opinion that the PRB liability accrued while Ravenna was an O&M contract would not be an allowable cost on the Modified Caretaker contract. This leaves RAI with a substantial unfunded and unreimbursable PRB liability at the time its current contract expires, as we shall see below.

Prefunding Projections

Exhibit 9-1 illustrates the inter-relationship between PRB costs and liabilities over time. The FY 94 costs assumes Ravenna does not transition to Modified Caretaker status, and is included so the reader will understand how the APBO changes from year to year. The Accumulated Postretirement Obligation (APBO) as of the beginning of FY 93 is referred to as the transition obligation, and is amortized in equal payments over 20 years. The end of FY 93 APBO is calculated by adding the year's service and APBO-related interest costs to the beginning period's APBO, and then subtracting out benefit payments made in FY 93. The net result is rolled over to become the APBO for the beginning of FY 94. This process is repeated for all years the PRB trust agreement remains in force. Any deviations from the valuation's projections and assumptions will result in either lower or higher contractor obligations, which would be recognized as actuarial gains or losses. Actuarial gains and losses are generally recognized over a fixed period of time, and are amortized in a manner similar to the transition obligation.

The cost associated with return on trust plan assets is a reduction to the overall contribution required, and of course also reduces the amount the government is required to reimburse. Line 5 is the total contribution required to fully fund the PRB trust plan; please note that benefit payouts are necessary to calculate the interest on the APBO and the return on trust assets, but is not itself a contractual cost. If the planned projection equals the actual PRB prefunding costs incurred, after

EXHIBIT 9-1

PRB Funding Projection Ravenna AAP Contractor Proposal (Current Dollars)

PRB Concepts

	(a) <u>FY93</u>	(b) <u>FY94</u>	<u>Calculations for FY 94:</u>
1. ABPO Begin of Period	\$13,813,954	\$14,426,688	(=6.a)
2. PRB Trust Assets	0	1,303,431	(=2.a + 4.a - 5. - 3.4a)
3. Components:			
3.1 Service Cost	179,102	190,909	(from valuation results)
3.2 Interest Cost	1,208,392	1,260,156	(.09 * [1.b - 5.b * 50%])
3.3 APBO Amortization	690,698	690,698	(=1.a/20 years)
3.4 Return on Assets	(0)	(96,245)	(= -.09 * [2. - 5.b * 50% + 3.1b])
4. Total Contribution	<u>2,078,191</u>	<u>2,045,518</u>	(=3.1 + 3.2 + 3.3 + 3.4)
5. Benefit Payouts	774,760	849,898	(from valuation results)
6. APBO End of Period	14,426,688	15,027,855	(=1.b + 3.1b + 3.2b - 5.b)

Major Assumptions

Discount rate is 9.0 percent.
Amortization period is 20 years.

Source: FY 93 revised contractor proposal, dated 21 Jan 93 (excluding 76 hourly employees)

20 years the only PRB contribution required will be the annual service costs for active employees. This is because the return on plan assets will exactly offset the interest on the APBO, and no more amortization costs would be required after 20 years.

Comparison with Other Prefunding Agreements

As stated before, the contractor's benefit package, actuarial assumptions, and population characteristics have huge impacts on the size of the PRB obligations a contractor will face. Exhibit 9-2 compares the two prefunding agreements which are currently in force at AMCCOM. Joliet AAP is an inactive ammunition plant located close to Chicago; it will also transition to Modified Caretaker status in FY 94. Even though the populations are roughly comparable, Ravenna's liabilities are 30 to 70 percent lower than Joliet's on a per capita basis. The Joliet agreement's actuarial assumptions are generally more conservative (e.g. resulting in higher costs) than Ravenna's. In addition, RAI has implemented substantial cost containment measures for future retirees. Current retirees maintain the old plan. These cost containment measures include capping Medicare per capita costs at a fixed dollar amount, and eliminating the prescription drug benefit. We can see the impact of these measures when we examine the variances with the Joliet plan: Ravenna's per capita obligations are 30 percent less than Joliet's for current retirees, but 70 percent lower for active employees not yet retired. This demonstrates just how successful cost containment measures can be in limiting future contractor liabilities and government cost reimbursements.

Prefunding Reality Check

The most useful technique government analysts have at their disposal to verify that the contractor's proposed costs are reasonable is a reality check comparing recent historical claim experience with the first few years of the valuation's projected benefit outlays. For example, the initial contractor proposal for Ravenna included:

CY 91 Actual Claims	Projection from 11/1/91	Annual Increase
\$536,860	\$830,789	54.7%

This huge increase in benefit outlays was not explained by the medical cost trend, or any other assumption used in the valuation. AMCCOM challenged the contractor, who admitted an error had been made. The contractor had incorrectly included individuals receiving deferred pension benefits with the PRB population. The contractor's revised FY 92 benefit projection of \$701,614 was in line with the assumptions used. This revision reduced the past service liability (i.e. APBO) by about \$2.2 million, and reduced the FY 93 prefunding cost by \$300,000.

EXHIBIT 9-2

COMPARISON OF PREFUNDING PRB AGREEMENTS AT JOLIET AND RAVENNA AAPs

(Current FY 92 Dollars)

o KEY COST COMPONENTS	<u>JOLIET</u>	<u>RAVENNA</u>	<u>VARIANCE</u>
oo TRANSITION OBLIGATION PER CURRENT RETIREE	\$80,366	\$55,730	-30.7%
AVERAGE AGE RETIREES	68.0	73.3	---
- - -			
oo TRANSITION OBLIGATION PER ACTIVE EMPLOYEE	\$48,216	\$15,021	-68.8%
AVERAGE AGE ACTIVES	48.5	44.8	---
AVERAGE SERVICE YEARS	16.8	10.3	---
- - -			
oo SERVICE COST PER ACTIVE EMPLOYEE	\$3,792	\$1,113	-70.7%

o DISCOUNT RATE	8.5%	9.0%	---

o SOURCE			
oo JOLIET COSTS BASED ON FY 92 PRB AGREEMENT WITH UNIROYAL CHEMI COMPANY, INC. AGE AND SERVICE LIFE DATA FOR ACTIVES IS BASED AMSMC-CAS DATA ANALYSIS.			
oo RAVENNA COSTS ARE BASED ON THE RAVENNA ARSENAL, INC. FY 93 RE PROPOSAL, DATED 21 JAN 93 (EXCLUDING 76 HOURLY EMPLOYEES). C DATA CITED IS FOR YEAR BEGINNING NOV 91 (APPROXIMATELY FY 92)			

Plant Shutdown Liability

The PRB obligations a contractor faces do not end at contract termination. The contractor's promise to offer PRB to retirees will remain in force. At contract termination, the contractor's liability will remain unchanged for current retirees. As for current employees, those who are not retirement eligible would be laid off without receiving PRB. Employees who are eligible to retire will be forced to retire early, resulting in a higher than anticipated PRB cost for these individuals. For these two reasons, the contractor's PRB liability after contract termination will decrease only slightly from the liability if continued plant operation is assumed. Exhibit 9-3 indicates that the contractor's liability will only decrease from \$13.5 million to \$11.5 million after the current contract expires on 30 Sep 93. This is the present value of future benefit obligations, and under DoD's interpretation of cost accounting principles, is unreimbursable after the performance period of the contract ends.

EXHIBIT 9-3

PRB Costs
Shutdown vs Continued Operation
Ravenna AAP Prefunding Agreement
as of 1 Oct 93

(Current Dollars)

<u>Contractor Liability</u>	<u>Continued Operation</u>	<u>Shutdown</u>
Current Retirees	\$9,970,176	\$9,970,176
All Active Employees	3,564,025	N/A
Retirement Eligible Employees	N/A	1,550,828
	13,534,201	11,521,004
Less: Projected Trust Assets		1,182,192
Contractor Net Liability (1 Oct 93)		10,338,812

Source: Independent Government Estimate, AMSMC-CAS, Jan 93

Section VII

Other PRB Topics

Negotiating Process

Transitioning from pay-as-you-go accounting to prefunding requires a negotiated agreement between the contractor and the buying agency. Based on AMCCOM's experience, these negotiations generally take 6 to 9 months to complete. The process is somewhat cumbersome as it involves several parties (e.g. corporate headquarters, corporate plant personnel, corporate actuary (generally a consultant), PCO and contract specialist, government cost/pricing analysts, government lawyers, Defense Logistics Agency Insurance and Pension Branch, Defense Contract Audit Agency). Generally, the contractor's initial proposal does not contain detailed information on the assumptions and census data used to arrive at the final cost. AMCCOM's has had to request detailed information from contractors, and used this information to perform an independent cost estimate (IGE) of prefunding. AMCCOM's goal has been to obtain a revised proposal from the contractor, using negotiated assumptions, which closely matches the government IGE. The process of obtaining information, clarifying any remaining questions, and having contractor's make corrections/changes to the initial proposal can drag negotiations on for many months. Negotiations are also hampered because most contractor and government personnel are unfamiliar with the concept of prefunding.

PRB Cost Model

Cost Analysis has developed a PRB valuation model based on a customized Lotus 1-2-3 v. 3.4 spreadsheet. The model is partially automated using the Lotus marco programming language. The model is based on a modular design, with key assumptions such as medical inflation and mortality included in separate, linked files to allow sensitivity analyses to be performed rapidly. In addition, the internal consistency of the model is verified by confirming that the present values of pay-as-you-go cash flows equal the present value of prefunding contributions. The model's results are formatted in a funding projection which verifies the B trust fund balance will reach zero after the last plan participant is projected to die. The model's results have been within 5 percent of the contractor's revised proposal for the two prefunding agreements completed to date.

Contractor Pricing/Competitiveness Issues

The primary reason contractors have been reluctant to transition from pay-as-you-go accounting to prefunding has been a reluctance to increase the unit prices of ammunition, and face

becoming non-competitive in a period of defense downsizing. The net impact of the move to prefunding is defined as the total prefunding contribution required less the projected benefit outlays for that period. This net impact represents the incremental prefunding cost over and above costs which would have been incurred if pay-as-you-go accounting continued. In terms of the Ravenna example (refer to Exhibit 9-1), the net impact of prefunding for FY 93 is:

Total Prefunding Contribution	\$ 2.1M
Less: Benefit Payouts	0.8M
Net Impact of Prefunding	1.2M

The total cost of prefunding represents a 268 percent increase over the PRB cost under pay-as-you-go accounting, or a net impact of \$1.2 million. This type of negative cost impact will continue for many years as the transition obligation is amortized. After the transition obligation is fully paid off, however, prefunding will actually reduce costs. The only prefunding cost component remaining will be prefunding, as interest on the APBO and return on assets are expected to cancel each other out. For example, the service cost in FY 93 (\$179,102) is less than pay-as-you-go benefits cost (\$774,760) which would have resulted in a cost reduction of \$595,658 if the transition obligation did not have to be amortized as well.

Because Ravenna is an inactive plant, the cost impact of prefunding can not be measured in terms of the impact on the unit prices of ammunition. For active plants, AMCCOM anticipates the net impact of prefunding will increase unit prices by 4 or 5 percent.

Contract Terminations

One of the most difficult issues facing AMCCOM is how to address the issue of contractor PRB liabilities after a contract termination. As stated before, the Army's position is that the government's responsibility to reimburse PRB costs ends at the time of contract termination, with no contract termination settlement allowed. This policy is true of whether or not a contractor is prefunding as of the time the contract expires. The only recourse terminated contractors have to be reimbursed for these costs is a Public Law (PL) 85-804 request for extraordinary contractual relief. The Army Contract Adjustment Board (ACAB) has granted Remington Arms Inc. PL 85-804 relief for PRB liabilities it incurred while it was the operating contractor at Lake City Army Ammunition Plant in the amount of \$75 million. The Army is close to approving another lump-sum settlement equaling \$6 million with Uniroyal Chemical Co., Inc. for PRB liabilities arising out of its operation of Newport Army Ammunition Plant. The Newport claim is to be settled by the contracting officer, not through the PL 85-804 process, because promises made to the contractor at the time of contract

termination provided a legal basis for settlement within the framework of the Newport contract. It is anticipated the Army will face additional PL 85-804 claims in the near future as other contractors with substantial unfunded PRB liabilities face contract terminations.

Potential Policy Conflicts

The Financial Accounting Standards Board (FASB) issued SFAS 106 in December 1990, which prompted FAR rule 31.205-6(o) to be issued in June 1991, with a revision in August of 1991. However, the Cost Accounting Standards (CAS) were not updated to be consistent with FAR 31.205-6(o). This has led some in the government, primarily the Defense Logistics Agency (DLA), to contend that CAS 416, which predates FAR 31.205-6(o), has precedence over the FAR rule. CAS 416, which is concerned with the allowability of contractor insurance costs, states:

"The amount added to the reserve or fund in any cost accounting period must not be greater than an amount which would be required to apportion the cost of the insurance coverage fairly over the working lives of the active employees of the plan. If a contractor establishes a terminal-funded plan for retired persons or converts from a pay-as-you-go plan to a terminal-funded plan, the actuarial present value of benefits applicable to employees already retired shall be amortized over a period of 15 years."

DLA has interpreted the CAS 416 to be inconsistent with FAR 31.205-6(o), in that the generally accepted actuarial principles cited in the FAR rule would specifically conflict with CAS 416 in three areas: 1) an amortization period of less than 15 years, 2) amortization of interest on a unequal annual basis rather than straight-lined, and 3) apportionment of costs over a period other than the working lives of active participants (e.g. the attribution period ends at retirement eligibility). DLA's position is that due to the policy conflict, the CAS 416 should take precedence over FAR 31.205-6(o).

At the time DLA's objection to FAR 31.205-6(o) came to light, AMCCOM had already committed itself to negotiating the Joliet PRB agreement based on the SFAS 106 framework. This decision was tacitly approved by Headquarter, Army Material Command. To further buttress the AMCCOM position, the administrator of the Office of Federal Procurement Policy has written on the PRB accounting issue that, "...existing CAS pension or insurance coverage does not appear to offer a basis for treating PRB costs. In fact, the PRB nomenclature barely existed in the literature at the time of the earlier [CAS] Board." At this writing, AMCCOM's PRB agreements are being negotiated and implemented to be consistent with FAR 31.205-6(o) and generally accepted actuarial principles.

Contractor Funding/Tax Implications

No other issue is more intricate and confusing than the selection of funding vehicles for the PRB trust fund. This confusion is caused by intricate Internal Revenue Service (IRS) tax codes which limit the tax deductibility of PRB prefunding contributions. IRS policy is so incoherent that the IRS is itself unable to provide definitive guidance to contractors on this issue. Based on this state of affairs, it is clearly beyond the scope of this paper to provide definitive insight on this topic.

There are two main funding vehicles available to contractors, a VEBA Trust or a 401(h) Account. The Voluntary Employees' Beneficiary Association (VEBA) Trusts are established in accordance with IRS Code Section 501(c)(9). The 401(h) account is a distinct fund within a pension plan to fund PRB. The tax deductibility of trust contributions and income varies on the type of funding vehicle selected, and the contractors proposal may include assumptions which reflect these limitations. The government's role with regards to these funding vehicles is to insure the requirements of FAR 31.-205-6(o) are met. AMCCOM has relied in the past on the Defense Logistics Agency (DLA) Contractor Insurance and Pension Branch staff to provide guidance on which funding vehicles would be acceptable to the government. The bibliography contained at the end of this paper contains some useful journal articles on funding of PRBs.

Section VIII

--- Conclusion

Government policy with regards to PRB is still in its infancy. Undoubtedly, there will be further guidance and new developments relating to this issue in the near future, as the government gains more and more experience with contractors transitioning to prefunding. For near-term, however, prefunding of PRB will not be a routine contractual action, but will instead require special attention and careful analysis. This paper was intended to provide an overview of some of the concepts and issues AMCCOM is facing as its' GOCO contractors elect to begin prefunding, and not to provide definitive guidance of how PRB should be treated for government contracting purposes. It is hoped this survey will give cost analysis personnel some insight into the cost and policy implications of prefunding PRB, so if cost analysts are faced with this situation at other commands government personnel will have at least a partial understanding of the scope and magnitude of this important and urgent issue.

Appendix

Selected Bibliography

Actuarial Standard Board, Actuarial Standard of Practice No. 6, Measuring and Allocating Actuarial Present Values of Retiree Health Care and Death Benefits, October 1988

Actuarial Standards Board, Proposed Actuarial Standard of Practice, Selection of Economic Assumptions for Measuring Pension Obligations, July 1992

Amoroso, Vincent, Accounting for Retiree Medical Liabilities - Considerations for Selecting Financial Assumptions, Employee Benefits Journal, June 1990

Financial Accounting Standards Board, Statement of Financial Accounting for Postretirement Benefits Other than Pensions, reprinted in its entirety in the Journal of Accountancy, August 1991

Melbinger, Michael S. and Marianne W. Culver, The Maintenance, Funding and Modification of Retiree Medical Benefits, Employee Benefits Journal, September 1992

Rappaport, Anna M., Postemployment Benefits, Compensation and Benefits Management, Spring 1991 (includes useful discussion of PRB funding vehicles)

Steinberg, Richard M. et al, Auditing Postretirement Benefits: How to Deal with FASB 106, Journal of Accountancy, August 1992 (provides useful checklist of cost and pricing data government may want to obtain from the contractor in order to evaluate the contractor's PRB proposal)

Wilbert, James R. and Kenneth E. Dakdduk, The New FASB 106: How to Account for Postretirement Benefits, Journal of Accountancy, August 1991