

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

1046 SCOMM 28: JOINT GAS PIPELINE COMMITTEE, 1981-82

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UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Alaskan Northwest Natural Gas
Transportation Company

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Docket No. CP80-435

INITIAL COMMENTS OF ALASKAN NORTHWEST
NATURAL GAS TRANSPORTATION COMPANY
ON THE FINAL REPORT OF THE ALASKAN DELEGATE
AND DIRECTOR, AUDIT AND COST ANALYSIS,
OFFICE OF THE FEDERAL INSPECTOR

Pursuant to the Commission's August 21, 1981 order, Alaskan Northwest Natural Gas Transportation Company submits these initial comments on the Final Report to the Commission by the Alaskan Delegate and the Division Director, Audit and Cost Analysis, Office of the Federal Inspector (OFI) dated August 14, 1981 concerning the Certification Cost and Schedule Estimate (CCE) and Center Point requests of Alaskan Northwest. Alaskan Northwest's supplemental application for a final certificate of public convenience and necessity for the Alaskan pipeline segment of the ANGTS included a requested CCE of \$8.18 billion, excluding financing charges, and a Center Point of 1.28.¹

Alaskan Northwest's proposed CCE and Center Point were considered in a series of technical conferences conducted by the Alaskan Delegate and the OFI Director in the Fall of 1980. Also participating in this review were the OFI's consultants, Williams Brothers Engineering Company (WBEC), the Commission Staff and its consultants, Pervin & Gertz, and the State of Alaska. A Draft Report was issued in March 1981 by the Delegate and Director which contained tentative recommendations based primarily on an appended draft audit prepared by WBEC. Two further conferences preceded the Final Report which were followed by the filing of written comments on the issues addressed, one conference in March which considered the issues disputed in the Draft Report and a second brief conference in May on a limited issue.

I. STATEMENT OF POSITION

The Final Report (Report) recommends reduction of Alaskan Northwest's reconciled \$8.13 billion CCE by \$1.09 billion and deferral of any decision on certain

¹ The CCE was revised to \$8.13 billion in the Comments of Alaskan Northwest Natural Gas Transportation Company on the Draft Report of the Alaskan Delegate and the OFI Division Director (filed April 13, 1981).

specified CCE items totalling an additional \$620 million.¹ The Report also recommends that Alaskan Northwest's Center Point request of 1.28, representing an allowance of \$2.28 billion, be reduced to 1.20, or by \$448 million, and that an additional \$311 million be transferred from the Center Point value to the contingency portion of the CCE. The result is a recommended CCE of \$6.73 billion, or \$1.40 billion less than that requested by Alaskan Northwest, and a Center Point allowance of \$448 million less than that requested by Alaskan Northwest.

If adopted, the collective recommendations of the Report would eliminate any reasonable opportunity for Alaskan Northwest to earn the Commission approved center rate of return. This opportunity must be retained if the Alaskan Northwest partnership is to provide the equity necessary to complete this essential project.

Financing discussions are now in progress with major bank lenders who have been called upon to provide significant amounts of debt for the project and who must also assist in attracting other debt on a worldwide basis. The lenders are requesting the Alaskan Northwest partners to assume even greater financial risks during construction than envisioned at the time the Commission issued Orders 31 and 31-B. The willingness of the partners to consider assuming greater risks will be affected by many considerations, including the rate of return that can reasonably be expected to be earned on the risk capital. Additionally, the Alaskan Northwest partnership has been advised by the major bank lenders that its ability to attract debt from other countries will be significantly affected by foreign lenders' perceptions of whether the U.S. government continues to support completion of this project.

It is, therefore, obvious that in establishing a CCE and Center Point this Commission will play a principal role in determining the attractiveness of the investment necessary to raise the required equity and debt and thus the future course of the project. If the Commission endorses the Report's recommendations, thereby eliminating any reasonable chance for equity investors to earn the risk premiums which the Commission previously found necessary to attract capital, the likelihood of obtaining the necessary equity commitments will be greatly diminished. Furthermore, such action by the Commission may be perceived by foreign investors and others as an official downgrading of the national interest status of the project.

The Report's potentially crippling recommendations are based upon the authors' contention that the Incentive Rate of Return mechanism established in

¹ The Report recommends total adoption of WBEC's recommended reductions of \$1.09 billion to the CCE. WBEC's recommended reductions include a \$203 million reduction for State of Alaska socioeconomic and third party monitoring costs and a \$38 million reduction for project management costs with a \$26 million associated normal contingency for a total reduction of \$267 million. The Report recommends that this \$267 million be deferred, plus an additional \$620 million comprised of estimated costs for communications and supervisory systems (\$97 million), project management (\$447 million), Alaska Pipeline Coordinator (\$22 million), and an associated \$54 million contingency, for a total deferral of \$887 million.

Orders 31 and 31-B lends itself to submission of CCE and Center Point requests that are not risk neutral -- that is, the authors assert there is a greater than 50 percent chance that the project will cost less than the filed CCE, as adjusted for the Center Point request. The authors attempt to lend credence to their belief by alleging that: 1) the Alaskan Northwest estimators could not follow the Commission's IROR cost estimate definitions with precision and, therefore, could not have prepared a risk neutral estimate; and, 2) a comparison of this project with TAPS, the Alaskan oil pipeline project, indicates that Alaskan Northwest's actual cost growth will be much less than the expected costs projected in its filings. This reasoning then forms the foundation for the Report's recommended reductions to the CCE, which consist of the Report authors' arbitrary adoption of all of the numerous subjectively derived reductions to the CCE recommended in the WBEC audit, together with an even lower Center Point than was recommended in that audit.

The authors' contention is in fundamental error. First, in preparing the CCE and Center Point the estimators strictly adhered to the Commission's mandate in Orders 31 and 31-B that the CCE reflect only normal expected costs and that the Center Point cover cost impacts from abnormal events not be includable in the Change of Scope events. This task, which has the only record support in this proceeding, was not unusual or overly difficult, because the required cost segregation was not significantly different from standard estimating techniques for large projects. Additionally, a valid factual comparison of this project with TAPS or any other project will not support the Report's conclusions that the expected cost growth on this project will be less than that projected in the filing. If anything, such a comparison further supports the reasonableness of the CCE and Center Point requests. In essence, the authors' assertions amount to nothing more than a collateral attack on the cost categories established in Orders 31 and 31-B and the manner in which the Commission required such costs to be submitted to it for review.

In the final analysis the Report must stand or fall on the authors' ability to justify why the results of the WBEC audit, rather than the Alaskan Northwest estimate, more closely reflect the realistic estimate the Commission required be submitted for approval. Neither the controlling facts nor the Report provide such justification. The WBEC audit as admitted by the authors was "...performed with only a fraction of the resources required to develop an independent estimate."¹ Yet, the Report relies totally on and without variation from the WBEC audit for its recommended reductions to the CCE despite the authors' acknowledgement that the Alaskan Northwest CCE and the WBEC audit "...are close enough to corroborate each other..." and are within "...a range of estimated costs within which the Alaska Segment of the ANGTS can be expected to be built."² The credible opinions and persuasive explanations of those who prepared the Alaskan Northwest estimate, including the Project Management Contractor (PMC) and the execution contractors who participated in the construction of TAPS and many other multi-billion dollar construction projects are ignored, even where the WBEC audit has been demonstrated to be factually incorrect or premised upon faulty assumptions.

¹ Report at II-2.

² Id. at 6 and II-5.

The following table illustrates the dollar value differences between our CCE and Center Point and the Report and WBEC audit recommendations.

TABLE I
COMPARISON OF CERTIFICATION COST ESTIMATE
WITH WBEC'S EVALUATED ESTIMATES

Cost Element	Filed CCE ^{1/}	Recommended CCE ^{2/}	WBEC Evaluated Estimate ^{3/}	Adjustments to WBEC's Estimate	CCE As Adjusted	CCE Amounts To Be Deferred ^{4/}	CCE Requested To Be Approved	Reduction From Recommended CCE
Compressor & Metering Stations ^{5/}	\$ 693,073	\$ 667,739	\$ 642,141	\$ 15,922	\$ 658,063	\$ —	\$ 658,063	\$ 9,676
O & M Facilities	53,428	53,428	50,891	2,537	53,428	—	53,428	—
Temporary Facilities	926,881	909,148	867,538	32,841	900,379	—	900,379	8,769
Communications & Supervisory	96,622	96,622	96,622	—	96,622	(96,622)	—	96,622
Pipeline ^{6/}	4,289,077	4,273,787	3,662,670	557,406	4,220,076	—	4,220,076	53,711
Project Directorate	<u>1,246,461</u>	<u>1,261,095</u>	<u>966,981</u>	<u>283,556</u>	<u>1,248,537</u>	—	<u>1,248,537</u>	<u>12,558</u>
Subtotal	7,301,542	7,261,819	6,284,843	892,262	7,177,105	(96,622)	7,080,483	181,336
Contingency ^{7/}	<u>876,158</u>	<u>871,381</u>	<u>1,064,857</u>	<u>(203,562)</u>	<u>861,295</u>	<u>(11,578)</u>	<u>849,717</u>	<u>21,664</u>
TOTAL Certification Cost Estimate	8,177,700	8,133,200	7,349,700	688,700	8,038,400	(108,200)	7,930,200	203,000
Center Point Allowance	<u>2,304,000</u>	<u>2,278,900</u>	<u>1,514,500</u>	<u>764,400</u>	<u>2,278,900</u>	—	<u>2,278,900</u>	—
TOTAL (Excluding Finance Charge)	10,481,700	10,412,100	8,864,200	1,453,100	10,317,300	(108,200)	10,209,100	203,000
Finance Charge	<u>926,200</u>	<u>921,200</u>	<u>832,700</u>	<u>77,700</u>	<u>910,400</u>	<u>(12,200)</u>	<u>898,200</u>	<u>23,000</u>
TOTAL (Including Finance Charge)	<u>\$11,407,900</u>	<u>\$11,333,300</u>	<u>\$9,696,900</u>	<u>\$1,530,800</u>	<u>\$11,227,700</u>	<u>\$ (120,400)</u>	<u>\$11,107,300</u>	<u>226,000</u>
CENTER POINT RATIO ^{7/}	1.282	1.280	1.206		1.284		1.287	

- 1 CCE filed on July 1, 1980 as revised October 27, 1980 for the DOI reroute.
- 2 CCE as revised on April 13, 1981 pursuant to comments on the Draft Report.
- 3 WBEC Final Report issued by the Alaskan Delegate and OFI Director on August 14, 1981.
- 4 CCE amounts which Alaskan Northwest agrees are appropriate to be deferred.
- 5 Special studies have been restored to the appropriate WBS element.
- 6 Assigned contingency has been restored to the Center Point Allowance.
- 7 Center Point Ratio is derived by dividing the Center Point Allowance by the total CCE.

As shown in the preceding table and for the reasons set forth in these comments, Alaskan Northwest agrees with only \$95 million of the \$1.09 billion of the WBEC recommended reductions in the CCE and totally disagrees with any reduction in the requested Center Point value. Finally, Alaskan Northwest agrees with deferral of only \$108 million of the \$887 million for which the Report authors would defer CCE approval. For the reasons set forth more fully hereinafter, Alaskan Northwest respectfully requests Commission approval of a \$7.93 billion CCE and a 1.287 Center Point, subject to the revisions to the CCE resulting from the forthcoming filing on the referenced deferred items.

The major areas of disagreement between Alaskan Northwest's requests and the Report's recommendations can be summarized as follows:¹

A. CCE

1. Pipeline

A major contention of the Report and WBEC audit is that Alaskan Northwest failed to optimize resources when putting together the CCE.² More particularly, WBEC contends that a higher productivity than that estimated by Alaskan Northwest for laying the pipe can be achieved, that crews and equipment have not been optimized in the Alaskan Northwest estimate, that execution contractors and subcontractors will accept a reduced overhead and profit allowance, and that Alaskan Northwest's civil quantity estimates are overstated. Based on these erroneous contentions WBEC recommends reductions totalling \$612 million in the pipeline portion of the CCE.

First, WBEC premises its pipe lay rate productivity estimate on a study which, as Alaskan Northwest demonstrated in its April 13 comments on the Draft Report, totally ignores two work functions and underestimates another work function critical to avoidance of costly weld repairs. When the WBEC estimate is corrected to include factors which WBEC itself has ignored, its resulting lay rate estimate approximates that of Alaskan Northwest. Additionally, WBEC's lay rate estimate for this project is significantly higher than that projected by WBEC for essentially the same route five years ago in the very proceeding that led to the selection of Alaskan Northwest to construct and operate the Alaskan segment of the ANGTS. WBEC's estimate is also significantly higher than its recent estimate to Sohio for construction of flow lines at Prudhoe Bay over the next three years. The Report ignores these inconsistencies and deficiencies in adopting the WBEC lay rate reduction of \$172 million. Therefore, this arbitrary and unsupported reduction should be rejected.

Second, WBEC's other recommended reductions of \$195 million primarily in crew and equipment are based solely on an unsupported contention that certain

¹ This summary is solely for the purpose of identifying the major areas of disagreement among the many issues raised in this subproceeding. It is not intended to convey acquiescence in recommended reductions not summarized here. Alaskan Northwest's positions on such other reductions are explained in detail in the body of these comments and its April 13, 1981 Comments on the Draft Report, which incorporated by reference herein where noted.

² Report at III-15.

operations have been duplicated. No such duplication exists. In preparing its CCE Alaskan Northwest optimized crews and equipment for each of the six pipeline spreads. WBEC does not, and cannot, dispute this fact. Nor can WBEC demonstrate how crew and equipment reductions will permit accomplishment of the same amount of work in a shorter time frame. For these reasons WBEC's recommended \$195 million reduction should be rejected.

Third, in its draft audit released in March of this year WBEC recommended a reduction in the execution contractors' overhead and profit allowance from 18 percent to 15 percent, or \$105 million, and a reduction in certain subcontractors, overhead and profit for an additional \$15 million reduction. In its April 13 comments, Alaskan Northwest rebutted each reason advanced by WBEC in support of its recommended reduction in the execution contractors' overhead and profit allowance. In its final audit WBEC retracted two of the three reasons previously advanced in support of its position and relies now on only the assertion that the salvage value of the execution contractors' equipment, after adjustments for inflation, will be in excess of the Alaskan Northwest estimate. As the Commission is well aware, Orders 31 and 31-B prohibit the inflationary escalation of any costs in establishing a CCE.

With respect to the subcontractor overhead and profit allowance contained in the CCE, Alaskan Northwest noted in its April 13 comments that these amounts were obtained from subcontractors as the amount they currently realize for existing work. WBEC did not dispute this fact. Accordingly, its \$15 million recommended reduction should be rejected.

Finally, Alaskan Northwest's civil quantity estimates reflect what realistically can be expected to occur in the field. These estimates were prepared by contractors involved in the civil construction of TAPS and reflect their actual experience. WBEC's new "design" and resulting recommended reduction of \$125 million do not reflect actual arctic construction experience.

2. Project Directorate

The major areas of dispute in the area of project directorate are the Report's recommended deferral of CCE approval of a value for project management costs and the appropriate treatment of third party monitoring and socio-economic costs (government-related costs).

We requested approval of a CCE value of \$485 million for the estimated project management costs of the Project Management Contractor and Northwest Alaskan, as operator for the Alaskan Northwest partnership. The Report adopts the WBEC audited estimate for project management costs of \$446.8 million, but recommends that CCE approval of this amount be deferred until a detailed management plan has been submitted to and approved by the Federal Inspector. CCE approval of project management costs should not be deferred. There is no basis in either the President's Decision or the Commission's IROR orders for deferring approval of a CCE value for such costs. An overall management plan was submitted to the Federal Inspector on June 2, 1980 and has been approved in principle by OFI. Furthermore, as more fully explained hereinafter, there is no basis for \$33 million of the \$38 million WBEC recommended reduction in our project management costs.

Alaskan Northwest strongly objects to the Report's recommendation that it be required to estimate and be held accountable for government-related costs. As the Report itself concedes, Alaskan Northwest has no control over the preparation by various governmental agencies of estimates for monitoring and socioeconomic costs. Furthermore, it has no effective means for preventing governmental agencies from overrunning their estimates. Therefore, the Cost Performance Ratio should be adjusted to reflect actual governmental costs or, alternatively, such costs should be excluded altogether in calculating the IROR. Otherwise, Alaskan Northwest will be unfairly penalized for cost overruns by governmental agencies.

Finally, there is no basis for the recommended reductions of \$25 million and \$28 million in, respectively, the tax and insurance portions of our project directorate estimate.

B. Center Point

In Orders 31 and 31-B the Commission instructed Alaskan Northwest to prepare and submit an exhibit assessing the likelihood of abnormal events which could increase project costs and the resulting cost impacts, which exhibit would then be used to establish a Center Point.¹ The Report acknowledges that the Center Point exhibit filed by Alaskan Northwest conforms to this Commission mandate. However, the Report disagrees with the result reached and recommends a lower Center Point based upon extraneous considerations such as the ANGTS cost growth experienced to date, a comparison with TAPS, and the opportunities available to limit overruns.

These extraneous considerations do not support the Report's recommendation. Ironically, they instead buttress the reasonableness of Alaskan Northwest's Center Point request. For example, the Report's allegations that further cost growth will be accounted for in the design or scope change process ignore the fact that the cost increases may not qualify for such treatment, even assuming the Commission does not abolish the design change process as recommended by the Report. Moreover, the Report's attempts to compare this project at a 5 to 10 percent design stage with TAPS immediately prior to construction demonstrates the Report authors' willingness to go to extremes to justify arbitrary and unsupportable reductions. Finally, the Report's allegations that Alaskan Northwest can draw upon the TAPS owners and contractors with arctic construction experience to limit overruns is true. In fact, Alaskan Northwest drew upon this experience in preparing realistic CCE and Center Point requests, only to have the Report authors arbitrarily reject the views and opinions of this highly experienced group in each and every instance.

Alaskan Northwest submits that if the Center Point is to be reduced it can be done only on the basis of defects in the analysis submitted for Commission review. The Report can find no evidence of any such defects. In fact, the Report's largest single recommended reduction to the Center Point request -- an amount for unknown-unknown events -- is contradicted by WBEC's acceptance in principle that such events can and will occur and by the Report authors'

¹ Orders 31-B at 8.

statements that other experts could identify events which were not analyzed by Alaskan Northwest but which will increase project costs.

C. Design Change Policy

The President's Decision and Commission's IROR orders recognize that there will be two distinct cost estimate approvals at two different stages of design. In order to encourage the refinement in design that would take place between approval of the CCE and approval of the final design, the Commission in Condition 9 of Orders 31 and 31-B provided for a liberal design change policy prior to approval of the final design. The Report, however, attempts to restrict severely possible upward adjustments in the CCE for approved design changes. Contrary to the intent of the President's Decision and IROR orders, the effect of the Report's recommendations is to make the approved CCE, which is based on a 5 to 10 percent design, the final cost estimate, which was to be based on at least a 70 percent design. Basing the target costs on such an incomplete design will substantially increase the risk that the sponsors will not be able to earn the IROR. Therefore, the liberal design change policy prior to final design must be reaffirmed.

D. Other

With respect to other issues raised in the Report, we do not oppose deferral of establishment of a CCE value for communications and supervisory systems and affirmative action training programs. We also propose herein a labor inflation index for use in the IROR inflation adjustment mechanism. Finally, we will be submitting an estimate for the possible costs of damages to State of Alaska highways. We propose, however, that any such highway costs be treated similarly to our proposed treatment of other government-related costs.

E. Summary

For the reasons stated in these comments, Alaskan Northwest strongly opposes most of the Report's recommendations. The Report does not reflect a fair and even-handed evaluation of differing opinions, the reasons behind these opinions, and the relative experience of those rendering the opinions. We trust the Commission will make a thorough and balanced review of all the evidence concerning the matters in dispute and reach a realistic and reasonable decision resolving all of the remaining issues in a manner which will permit private sector financing and expeditious completion of the ANGTS.

II. BACKGROUND

A. Orders 31 and 31-B

In recognition of the potential for cost overruns on a project of the magnitude of the ANGTS, the President's 1977 Decision and Report¹ required the use

¹ Executive Office of the President, Energy Policy and Planning, Decision and Report to Congress on the Alaska Natural Gas Transportation System (September 1977) (hereinafter referenced as President's Decision).

of a variable rate of return mechanism to reward the sponsors for cost underruns and penalize them for cost overruns.¹ This mechanism was implemented by the Commission in its Orders 31 and 31-B where the Commission recognized at the outset that:

The final or ultimate cost of this project is now unknown; the best that can be done is to specify a probability distribution of possible final cost outcomes. The range of possible costs...for the Alaska segment, with its inherent uncertainties regarding system design and logistics of construction, is likely to be much broader.

Cost estimates for most large projects tend to increase as more is known about the detailed design of the system.² (Emphasis added).

Accordingly, the Commission established a four stage process for ascertaining the projected or target costs against which actual costs are to be measured in determining the incentive rate of return:

(1) Commission review and approval of a "Certification Estimate...based on the normal or likely conditions and parameter values that the sponsors expect to experience during construction (for example, weather conditions, field or soil conditions, prices, wage rates, and labor and equipment productivity)."³ This CCE is to consist of a base estimate and a normal contingency to reflect the normal uncertainty in assembling such estimate.⁴

(2) Commission review and approval of a Center Point, based upon the expected value of "...abnormal events that could increase costs which are not covered under the Change in Scope mechanism...."⁵

¹ The President offered the following guidance to the Commission in establishing an IROR mechanism:

Within certain maximum and minimum levels, return on equity would increase were the project to come in at or under budget but decrease were costs to exceed budget. Were the project under budget, consumers would pay a lower price for gas and sponsors would receive a higher return on equity. Were the project over budget, the higher total invested capital would be partially offset by a lower allowed rate of return on that capital, so that equity investors would assume part of the cost overrun.

President's Decision at 123.

² Order 31 at 15

³ Order 31-B at 7-8.

⁴ See the Commission's April 28, 1980 "Findings and Order Issuing Certificates of Public Convenience and Necessity and Authorizing the Importation of Natural Gas," Northwest Alaskan Pipeline Company, et. al., Docket Nos. CP78-123, et. al., at 95.

⁵ Order 31-B at 8.

(3) OFI Review and approval of the cost of design changes which occur between the time the CCE is approved and OFI approval of final design, pursuant to "...a liberal design change policy...."¹

(4) OFI review and approval of the cost of certain scope changes which occur after construction commences and which are beyond the control of the sponsors.²

The final target costs against which Alaskan Northwest's return will be measured will equal the CCE, as adjusted for the cost of design and scope changes, multiplied by the Center Point.

B. Alaskan Northwest's CCE and Center Point Requests

Alaskan Northwest has assembled a team of over 400 highly experienced cost estimators, cost engineers, design and pipeline engineers, and other experts representing every discipline necessary for estimating, designing, engineering, constructing, and controlling the cost of a project of the magnitude of the ANGTS. The companies working with Alaskan Northwest in this effort, and who assisted in the preparation of the CCE and Center Point values, include Fluor Engineers and Constructors, the Project Management Contractor, Gulf Interstate Engineering, Michael Baker, Jr., Inc., Northern Technical Services, Inc., and R&M Consultants, Inc. Also assisting in the preparation of the CCE were execution contractors who participated in the construction of TAPS, as well as many other multi-billion dollar construction projects in Alaska and Canada, including Morrison-Knudsen, Reading and Bates Construction Company, Peter Kiewit and Sons, Curran Houston Inc., a subsidiary of Sedco, and Green Construction Company. Collectively, Alaskan Northwest, Fluor, and these consultants spent over one year and more than 1,000,000 manhours preparing the CCE and Center Point analyses.

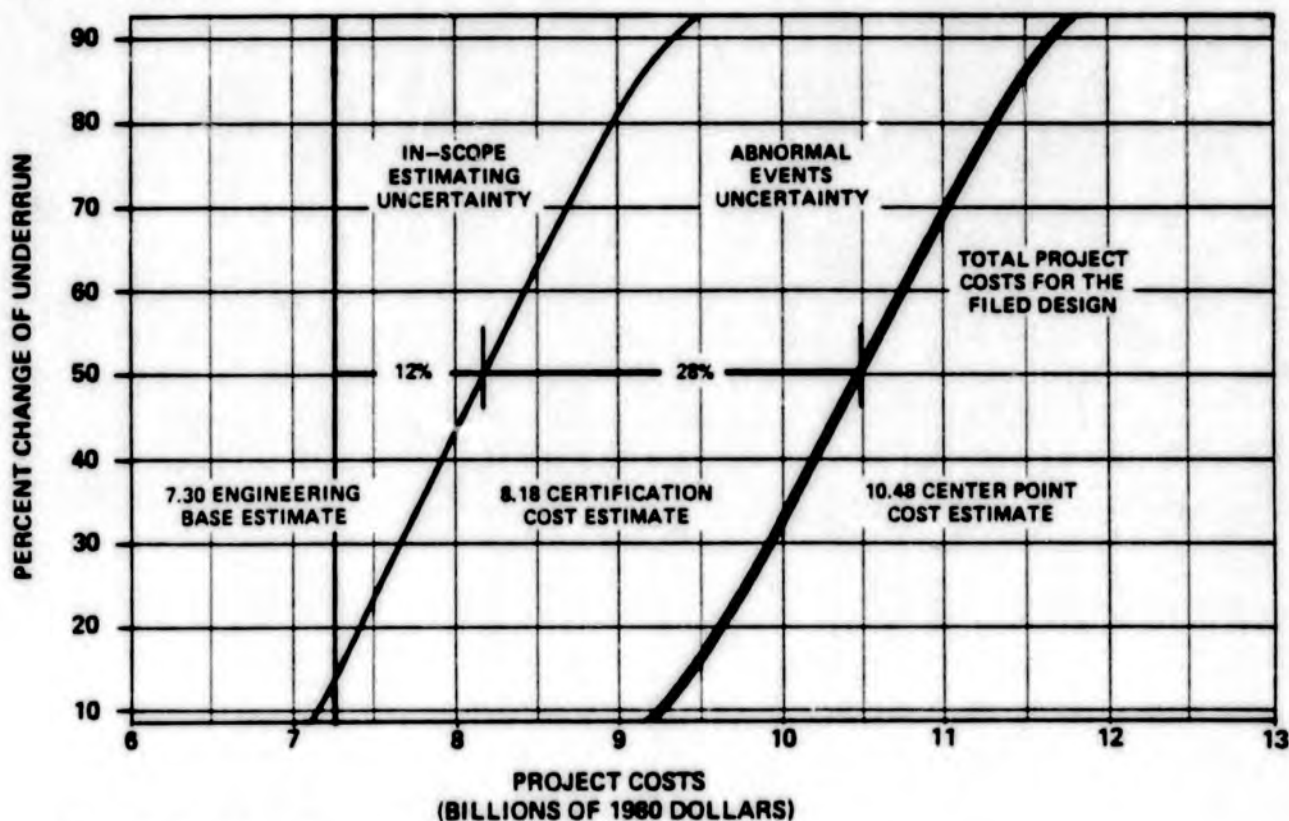
The approach utilized to prepare the CCE and Center Point has been referred to as the "four basket" approach. That is, costs have been assigned to the following categories, as required by Orders 31 and 31-B: 1) the base engineering estimate; 2) normal contingency; 3) abnormal events for the Center Point value; and, 4) design and scope changes.

The approach includes a risk analysis which quantified the "probability distribution of possible cost outcomes." The results of this risk analysis are shown

¹ Order 31 at 17. The Commission adopted this policy in recognition that the CCE would be approved at a time when project design was far from complete. Accordingly, the Commission concluded that the IROR mechanism must "...accommodate changes in cost estimates attributable to increasing knowledge of design requirements...." Id.

² Order 31-B at 73-75.

in the figure below. As the figure shows, the filed Center Point target cost of \$10.48 billion has an even chance of underrun or overrun, i.e. it is the risk neutral target cost.



1. The Base Engineering Estimate

In preparing the base engineering estimate, Alaskan Northwest obtained written bids from various suppliers of major materials and equipment such as the pipe itself, valves, compressors, turbines, power generation units, and refrigeration equipment. Quotes were obtained for corrosion coating, insulation, and major construction equipment. To ascertain the optimum levels of crew and equipment necessary to meet the project schedule, Alaskan Northwest, Fluor, and the execution contractors established the optimum level of crew and equipment productivity that must be maintained over the three year construction schedule. Alaskan Northwest and Fluor then proceeded to cost out these crews based upon existing craft labor rates in Alaska. Construction equipment costs were based upon new equipment prices depreciated in a traditional fashion. The resulting base estimate equaled \$7,302 million, broken down between work components as follows: 1) \$4,285 million for pipeline; 2) \$693 million for compressor and metering stations; 3) \$53 million for operation and maintenance facilities; 4) \$97 million for communications and supervisory systems; 5) \$927 million for temporary facilities and services; and, 6) \$1,247 million for project directorate, which includes project management costs such as salaries and related expenses, third party monitoring costs, insurance, and taxes.¹

¹ These were the CCE values requested in the July 1980 filing. The CCE values for which Alaskan Northwest is here requesting Commission approval are set forth in the table on page 4 of these comments.

2. Normal Contingency

A normal contingency was added to this base estimate to reflect the normal uncertainties in putting together such an estimate. In order to avoid any double counting between the base estimate, contingency, design and scope changes, and abnormal events, the contingency was carefully defined prior to establishing the base estimate to represent in-scope estimating uncertainty resulting from the following: accuracy of material quantity estimates; accuracy of material price estimates; human productivity assumptions; equipment reliability assumptions; engineering/design development; accuracy of scheduled durations; and, accuracy of bid specifications based on current project definitions. Utilizing a probabilistic analysis where both potential increases and decreases are weighed, the appropriate contingency was then determined to be \$876 million, or 12 percent of the base estimate.

3. Center Point

In Order 31-B the Commission requested Alaskan Northwest to prepare an exhibit assessing "...the likelihood of abnormal events that could increase costs..." which exhibit would then "...be used to set a Center Point..."¹ Accordingly, Alaskan Northwest identified 35 specific abnormal events that could increase project costs, plus an additional category of cost impacts recognized in major projects as "unknown-unknown" events, and prepared an analysis of the risks of cost overruns from these abnormal events.

Because the Commission wanted "...a clear separation and distinction between the basic cost estimate itself and allowances for abnormal or unexpected events that may or may not occur..."² the list of abnormal events was carefully screened to ensure that: 1) events could be quantified separately and, thus, there would be no double counting between events; 2) no event could be considered a design or scope change, since the CCE will be adjusted to reflect the cost consequences of design or scope changes approved by the Federal Inspector; and, 3) no similar event had been included in contingency, because Orders 31 and 31-B require that the Center Point cover only the cost impacts of abnormal events.

In the detailed risk analysis, each event was assigned a probability of occurrence and a range of cost impacts by experts of Alaskan Northwest and Fluor experienced in preparation of risk analyses. A probabilistic analysis was then performed to derive the expected value of each abnormal event. The expected values of the abnormal events were added to arrive at the total dollar impact of potential cost overruns from the CCE. The CCE of \$8.18 billion (base estimate plus normal contingency) plus the allowance of \$2.30 billion for abnormal events divided by the CCE yielded a Center Point Ratio of 1.28.³

¹ Order 31-B at 8.

² Order 31-B at 7.

³ Alternatively, the Center Point can be calculated with the formula:

$$\text{Center Point} = 1.0 + \frac{\text{expected value of abnormal events}}{\text{CCE}}$$

III. DISCUSSION

A. Alaskan Northwest's Methodology for Preparing the CCE and Center Point Values was Valid

A common theme throughout the Report is that the "four basket" approach "conflicts with the intent and/or letter of the IROR Orders," that the approach "...is not a familiar one to estimators," and that "its implementation by anyone would be difficult before the project is actually constructed."¹ From this, the Report presumes that certain costs have been overstated because estimators could not have possibly categorized costs properly between the "four baskets" to arrive at a risk neutral estimate and because "[n]either contractors nor engineering/design firms typically prepare risk-neutral bids or estimates."² Accordingly, the Report recommends adoption of certain reductions in the CCE itself based upon WBEC's belief that a higher productivity could be achieved with less labor and equipment and that civil materials are overstated.

The Report also recommends a reduction in the Center Point value, again because of an intuitive feeling that the values are overstated due to the estimators' inability to estimate costs under a "four basket" approach, because certain abnormal events allegedly were compensated for in the IROR Risk Premium, and because of a belief that cost overruns on other projects at a similar design stage were not as great as the Center Point request.

The Report's conclusory statements on the "four basket" approach and risk neutrality are not supported by Orders 31 and 31-B, traditional cost estimating procedures, the methodology utilized in preparation of the CCE and Center Point values, or a valid, factual comparison of this project with others at various design stages. Yet, the Report uses these statements as justification for recommending adoption of the WBEC audit and rejection of the filed CCE in each instance where the WBEC audit is lower. The Report also places great reliance on these statements in arriving at its Center Point recommendation. Because these statements are demonstrably invalid, the Report's recommendations must be judged by weighing the opinions of WBEC, based upon its construction and construction management experience, the facts and input available to WBEC in preparation of its audit, and the detailed support behind that audit, against the opinions of the Alaskan Northwest estimating team based upon their construction and construction management experience, the facts and input available to them in preparation of the CCE and Center Point values, and the detailed support behind the Alaskan Northwest filing.

1. The "Four Basket" Approach

Contrary to the Report's allegations, Orders 31 and 31-B required utilization of the "four basket" approach. Those orders required submission of a CCE, consisting of a base estimate and separate contingency allowance, and the separate submission of an exhibit dealing with abnormal or unexpected events which would be utilized to establish a Center Point value. Those orders also adopted design and scope change mechanisms which require that such changes be examined

¹ Report at II-8 and III-18

² Id. at II-6.

separately from the CCE and Center Point. Finally, the Commission in those orders did not find that the cost segregation requirement would be either difficult or impossible, or that the requirement would inherently result in cost duplication. The Report's allegations are nothing more than a collateral attack on the IROR process itself established in Orders 31 and 31-B.

Additionally, the allegation that the "four basket" approach is not familiar to estimators and cannot be implemented ignores normal estimating practices. Historically, major engineering and construction firms utilize a segregated estimating approach, albeit not in the regulatory context, for providing clients with the expected cost of a project. For example, contractors do not include in an estimate the cost of potential design changes because: 1) there normally is no basis for estimating such costs since there can be no scope of work on design changes until such changes are defined; and 2) inclusion of costs for possible design changes not yet known would render the estimate or bid uncompetitive. Contractors historically seek and receive compensation for all work performed outside of a very rigid and precise scope of work definition, a definition which excludes all potential design changes. Abnormal events are also segregated because such events are outside the control of the contractor, but instead represent a risk to the project owner for which the contractor will be reimbursed. The contractor is protected against these risks by various contractual provisions including force majeure clauses. While contractors exclude these costs from bids, they represent real costs to the project owners.

Finally, it is inexplicable for the Report to conclude that the Alaskan Northwest estimating team could not have properly categorized costs between the "four baskets" to arrive at a risk neutral estimate, but that the authors and their consultants could properly perform this task, even to the extent of creating a "fifth" basket entitled "assigned contingency."¹ The Report's conclusions are even more disturbing given WBEC's admitted unfamiliarity with the IROR mechanism and the limited time available to them to conduct their audit.

2. Risk Neutrality

The Delegate and Division Director's apparently intuitive, but unsupported belief that the CCE and Center Point values are too high is particularly evident in such statements as:

...ANNGTC's base estimate plus "contingency" reflects a degree of assurance well above the target envisioned by the IROR. While it is impossible to assess exactly how much the ANNGTC CCE is above the roughly 50% assurance level, we suspect it is somewhere in the mentioned 70-80% range.²

and

...one would expect a risk-neutral estimate to be below what would be estimated in a commercial setting. We have concluded that Alaskan Northwest's proposed CCE overstates risk-neutral construction costs."³

¹ See, e.g., Report at III-19.

² Draft Report at II-9 (emphasis added).

³ Report at II-6.

The authors' intuitive beliefs are contrary to the overwhelming historical evidence and experience that commercial cost estimates which underestimate actual costs are the rule rather than the exception.¹ The Commission itself recognized this in Order 31 at page 43 stating:

Common observation as well as historical and statistical studies of many different types of large projects have revealed a tendency for the estimates of total cost-to-completion to increase as a project moves over time from initial conception to completion. In the early stages of a project this growth often reflects the study required to turn an idea into a detailed set of plans and specifications. In the process of research, evaluation, planning, and budgeting, natural initial optimism is tempered by more realistic appraisals; and in the usual case, unperceived complexities are discovered and the difficulty of the required tasks becomes better understood. (footnote omitted).

Ignoring this historical evidence the Report attempts to bootstrap its risk neutral assertions by comparing TAPS at its April 1975 stage to this project, where the CCE and Center Point were prepared at a 5 to 10 percent design frozen as of the First Quarter 1980 in order to prepare the CCE filing, and concludes that further cost overruns for completion of the Alaskan segment should not be any more than the 23 percent experienced by TAPS from 1975 to completion. This conclusion has no basis in fact. The TAPS April 1975 estimate was made two years before project completion, when design engineering was 90 percent complete, the haul road was completed, all mainline pipe was purchased and delivered, all other major equipment and vessels were on order, construction camps were in place and in operation, the project labor agreement had been executed, labor rates had been established, mobilization was nearly complete, execution contractor manning schedules were established, field construction work for the pipeline, stations, and terminal had started, and major support contracts had been awarded and executed. Based on the above, it is beyond question that a comparison of where TAPS was in April 1975 with where this project was at the time the CCE was prepared is not valid. We would note that the TAPS 1973 estimate of \$4.09 billion, excluding contingency, was prepared when TAPS was at a comparable stage with Alaskan Northwest, and the final cost of TAPS was approximately \$8 billion,² or 95 percent over this 1973 estimate.

¹ The Rand Corporation, "A Review of Cost Estimation in New Technologies: Its Implications for Energy Process Plants," Report No. R-2481-DOE (July 1979); Walter J. Mead, et al., "Transporting Natural Gas from the Arctic, the Alternative Systems," American Enterprise Institute for Public Policy Research (AEI Studies 171), Washington, D.C. (1977); Department of Energy, United Kingdom of Great Britain and Northern Ireland, "North Sea Costs Evaluation Study," Energy Paper No. 7 (December 31, 1975); and United States General Accounting Office, "Report to Congress of the United States, Lessons Learned from Constructing the TransAlaska Oil Pipeline," Report No. EMD-78-52 (June 15, 1978).

² The difference between the 1973 TAPS estimate, which was computed in "as spent" dollars, and the final TAPS cost is substantial even when the 1973 estimate is adjusted for any inflation.

The Report attempts to dismiss the differences between TAPS in 1975 and this project at its January 1980 stage by asserting that reduced uncertainties about labor and equipment productivity should offset any increased risk of cost growth and that Alaskan Northwest is free to submit design changes to OFI. Thus, the Report concludes that Alaskan Northwest should be able to live with the risks associated with a lesser design.¹ Alaskan Northwest is at a loss to understand how these bald assertions create a meaningful comparison. First, what has suddenly caused this reduced uncertainty about labor and equipment productivity? It certainly is not the Report itself, which ignores the crew and equipment productivity estimates of EC's working in Alaska and recommends substituting WBEC's more optimistic views. Second, even if the design change process is not modified or restricted as the Report recommends, that process alone is not the panacea for the cost overruns that can and do increase initial estimated costs by as much as 50 to 100 percent through completion. Thus, a comparison of this project with the Report authors' unsupported conceptions of TAPS provides no justification for their view that the CCE and Center Point are not risk neutral.

Finally, we note that underlying biases, whether consciously or unconsciously motivated or simply due to ignorance, can have a considerable influence on an estimate. The sources cited by the Report itself, such as the GAO Report, confirm this point. In fact "estimating philosophy" (the intention of the estimators) is generally recognized as one of the major factors contributing to estimator error. Therefore, it is incumbent on the Commission to evaluate the predisposition of the Report and WBEC.

The Report and WBEC clearly reflect an underlying bias -- namely, that Alaskan Northwest and its contractors must have tried to inflate their estimates. The whole tone of the WBEC audit reflects a predisposition to search for overestimation. Furthermore, audits are by nature specifically suited for finding errors in stated costs rather than identifying missing cost elements. The WBEC process is, therefore, clearly biased downward.

The assumption that Alaskan Northwest had a bias toward an inflated cost estimate fails to recognize the actual balance of pressures on Alaskan Northwest. The countervailing pressure being that a higher target cost makes the project more difficult to finance and adversely affects marketability projections. As a result, the filed estimate was built under constant exhortation to realism. It is not inflated and represents the best and most realistic judgment of the Alaskan Northwest estimating team.

B. The Recommended Reductions to the CCE are Arbitrary and Unsupportable

The Report finds the CCE is within "... a range of estimated costs within which the Alaska Segment of the ANGTS can be expected to be built," and that the CCE and independent WBEC audit "are close enough to corroborate each other...."² The Report further finds that:

¹ Report at III-28.

² Report at II-5 and 6.

A cost estimate, by definition, cannot be exact. It is a "best judgment" based on a variety of factors. These factors include past experience, the complexity of the estimate, the design and its degree of development when the estimate is prepared, the instructions given the estimators, the assumptions underlying the estimate, and the amount of information available to the estimator. Thus, individual estimators may disagree, not only on the selection of a "best" figure, but also on the odds they would assign to completion of a project within a given cost range.¹

Alaskan Northwest agrees that cost estimation is not an exact science and that estimators will disagree. Yet, the Report accepts and urges adoption of all the reductions to the CCE recommended in the WBEC audit and continues to ignore the experienced judgments of Alaskan Northwest, Fluor, and their consultants on areas of disagreement, even where Alaskan Northwest demonstrated in its April 13, 1981 comments on the Draft Report² that the WBEC audit was factually incorrect or premised upon erroneous assumptions or information. Reasoned decision-making requires more. Accordingly, Alaskan Northwest must again address each of these disputes and indicate why the WBEC audit should not be adopted. For brevity, we will incorporate by reference wherever possible our prior comments.

1. Pipeline

The Report recommends a \$612 million reduction to the pipeline component of the CCE based exclusively on the WBEC audit conclusions that: a) a higher rate of productivity can be achieved in laying the pipe; b) the project schedule can be met with a reduction in certain other crews and equipment; c) overhead and profit for both execution contractors and certain subcontractors can be reduced; and, d) civil quantity materials can be reduced based upon new design drawings prepared by WBEC itself. We address these conclusions separately.

a. Pipeline Lay Rate

The crews and equipment involved in laying the pipe were estimated based on achievement of an average lay rate of 40 joints per day for 80-foot, double jointed, non-insulated pipe and 35 joints per day for insulated pipe.³ This rate was collectively arrived at by the execution contractors who assisted Alaskan Northwest and Fluor in the preparation of the CCE and is based upon their prior arctic experience, including TAPS where each of these execution contractors achieved a much lower average lay rate, generally 25-30 joints per day. Their justification for a 30 to 40 percent higher lay rate for this project vis-a-vis TAPS is that, unlike TAPS, the Alaskan Northwest execution contractors will exercise total control over their pipeline spread under fixed price contracts, including all labor relation matters.

¹ Id. at 11-6.

² Comments of Alaskan Northwest Natural Gas Transportation Company on the Draft Report of the Alaskan Delegate and the OFI Division Director (filed April 13, 1981) (hereinafter cited as April 13, 1981 Comments).

³ An average lay rate of 40 joints per day means that on some days a higher lay rate will be achieved, on other days a lower rate will be achieved.

1) WBEC's "Time and Motion Estimate"

WBEC justifies a \$172 million reduction to the CCE by utilizing a higher lay rate than that contained in the CCE. WBEC's lay rate is based on what WBEC refers to as a "time and motion estimate," which is actually only a subjective WBEC time estimate of a portion of one crew in the pipe laying process. In our April 13, 1981 comments on the Draft Report,¹ we noted that in preparing this "time and motion estimate" WBEC had clearly underestimated the time required for certain lay rate operations and completely ignored other necessary operations.² For example, WBEC recommends a welding speed of 14 inches per minute. Our experience is that this speed will produce an unacceptable percentage of defective welds, and this is corroborated by the Alaskan Welding Center and Exxon Production Research Company, who both claim the optimum welding rate for high grade 48-inch, X-70 grade pipe is 8 to 12 inches per minute. WBEC's response is that the Alaskan Welding Center materials did not describe the tests they performed and that since EPR admits that pipeline welders can work at higher speeds than 12 inches per minute, albeit with a higher weld rejection rate, the EPR recommended optimum speed should be rejected.³ Suffice it to say that six execution contractors and two highly regarded welding experts recommend a speed lower than WBEC's speed for one obvious reason: the higher speed increases the risk of defects and costly weld repairs.

The integrity of the pipeline is paramount and high quality first time welding is more conducive to this integrity than excessive repairs regardless of the repair quality. Alaskan Northwest would note that "optimization" of a higher weld rate by acceptance of more repairs is not common construction practice for pipelines. Moreover, there could be special problems in Alaska if such an "optimization" were performed and high reject rates were encountered. For example, the time to radiograph, analyze, locate, and repair defective welds would require the ditch to be open for longer periods of time. This could be a serious problem in permafrost where thawing and degradation occur. The alternative to leaving the ditch open would be to make repairs in bellholes after the pipe is buried, an uneconomic procedure. Furthermore, defects which involve cracks in root beads require that the entire weld be cut out and a "pup" joint inserted and rewelded. In this case, two complete girth welds are required. It is difficult to imagine that numerous repairs of this nature could be economic,

¹ See April 13, 1981 Comments Vol. 1 at S-1 to S-4; Vol. II at 1-1 to -13.

² The Report's statement that we did not challenge WBEC's lay rate estimate is false. Report at II-10. WBEC's estimate was presented in the October 22, 1980 conference as a "working paper" "circulated...for purposes of discussion" which did not represent the official position of the Delegate or Division Director. October 22, 1980 Tr. at 21. Mr. Grassman of WBEC stated that "[i]t's strictly a work paper." *Id.* at 22. After an opportunity to review this work paper over the luncheon recess, we expressed our initial concerns with it. *Id.* at 23-35. Later when the discussion paper surfaced as the official position of the Delegate and Director, we performed a more thorough analysis of its shortcomings and made these known in our April 13, 1981 Comments. The Report, however, has chosen to ignore these comments.

³ WBEC Vol. I at 1-49.

and yet a higher welding speed will result in more "cutouts". The acceptance of a higher than normal defect rate would mean that in the event of an audit of radiographs, a proportionately higher number of possible defects would be identified. Under these circumstances, repairs would be made after the pipe had been buried, and the resulting cost increases would more than offset any savings from a faster weld rate. In summary, the "optimization" of weld rate and defect repair is not a common practice. The purported savings have not been demonstrated, and the prudence of this practice is questionable. Therefore, the assumption of such "optimization" is not appropriate for any cost estimate.

In addition to underestimating certain cycle times in preparing its time and motion estimate, WBEC also ignored certain critical work elements. More specifically, in its draft audit WBEC listed certain operations that take place in pipe-laying and then assessed a time for each element. These cycle times were added to achieve WBEC's projected ideal lay rate. This ideal lay rate was then multiplied by efficiency factors to achieve WBEC's estimated lay rate. Both at the Tulsa technical conference and in our April 13, comments we questioned why WBEC neither listed nor estimated any cycle time for two critical operations: the sequences of striking multiple arcs and changing welding rods. WBEC admitted in its final audit that these cycle times were in fact not estimated, but claimed they were accounted for in the efficiency factors applied to their so-called ideal lay rate to obtain their estimated lay rate.¹ This answer is spurious at best. How can WBEC prepare a study which attempts to estimate the specific times allegedly necessary for each and every operation and then claim that those not included are accounted for in efficiency factors which WBEC had precisely defined to include only the impact of weather, terrain, and human and equipment productivity?

In its April 13 comments Alaskan Northwest noted that while a "time and motion estimate" is invalid because it will yield any result the preparer desires, the WBEC study would yield an average rate of only 39 joints per day rather than 47 to 50 joints per day if it is properly adjusted for those changes necessary to account for the operations ignored by WBEC and the weld speed rate reduction needed to avoid costly weld defects.²

WBEC admits that a "time and motion estimate" is not used by execution contractors to develop their lay rate estimates for final bids, that the time and motion estimate was created for this proceeding alone, and that its estimate "...was not intended to represent an EC type estimate, but rather was intended to represent an estimate (based on experience) that the EC's should be able to lay 45 to 50 joints per day."³ Alaskan Northwest questions why WBEC would perform a study it admits is not prepared by execution contractors in submitting bids and why it should be relied upon?

¹ WBEC Vol. I at 1-44.

² In arriving at 39 joints per day, no other changes were made to the inputs underlying the WBEC "time and motion estimate", including the efficiency factors which Alaskan Northwest agreed to originally with the understanding that they were premised, not on forgotten cycle time operations, but in weather, terrain etc.

³ WBEC Vol. I at 1-41, 1-50.

2) Other WBEC Lay Rate Estimates

Alaskan Northwest also must question why WBEC did not address the questions raised in Alaskan Northwest's April 13, 1981 comments (Vol. I at S-3) regarding WBEC's 30 percent increase in its current lay rate estimate over the estimate that it submitted in the competitive proceedings that led to the selection of Alaskan Northwest?¹ In that proceeding Mr. Franks of WBEC, who prepared the WBEC "time and motion estimate" for this proceeding, testified that an average year-round lay rate of approximately 2,640 feet per day, or 33 joints per day, was reasonable for a proposed 800 mile, 42 inch pipeline which would have paralleled the majority of the Alaskan Northwest route. Mr. Franks now estimates a rate of 3,760 to 4,000 feet per day, or 47 to 50 joints per day, over essentially the same route. even though larger diameter pipe will be utilized thereby increasing the amount of weld time.

Additionally, Mr. Franks has recently supplied Sohio with WBEC's estimated pipe lay rate for new flow lines to be constructed between 1982 and 1985 at Sohio's Prudhoe Bay facilities.² Those average rates for smaller pipe between 20 and 36 inches in diameter are significantly less than Mr. Frank's prior two estimates for an Alaskan gas pipeline. For example, WBEC's estimated lay rate for Sohio's 36 inch pipe ranges from a low of 936 feet per day during winter construction to a high of 1,560 feet per day for summer construction. This compares to their 1975 lay rate in the El Paso Alaska comparative hearings of 2,640 feet per day for 42 inch pipe and their current "time and motion estimate" of 3,760 to 4,000 feet per day for 48 inch pipe. We question how WBEC can now significantly increase its 1975 estimate presented to the Federal Power Commission from 33 joints to 47 to 50 joints per day for the Alaska Segment and why WBEC then estimates a much lower lay rate for Sohio's Prudhoe Bay work?

3) Comparison with Alyeska

WBEC alleges that Alaskan Northwest should obtain a higher lay rate than Alyeska. We do not disagree. In fact our estimate is significantly higher than that actually obtained on TAPS on a joints per day basis. In addition, Sohio Gas Pipeline Company has compared the actual weld productivity for Alyeska with that estimated by Alaskan Northwest on an average manhour basis, which comparison demonstrates that Alaskan Northwest's estimated productivity is optimistic compared to the actual TAPS experience.³

¹ See Tr. 35017, El Paso Alaska Co., et. al., FPC Docket No. CP75-96 et. al.

² See Appendix A, letter of Arlie M. Skov, Sohio Gas Pipeline Company to Cuba Wadlington, Jr., Northwest Alaskan Pipeline Company, dated September 15, 1981. WBEC supplied these estimates to Sohio Construction Company in September 1981.

³ See Appendix B, letter of V. A. Breitenbach, Sohio Gas Pipeline Company to Cuba Wadlington, Jr., Northwest Alaskan Pipeline Company, dated September 15, 1981.

4) Actual Lay Rate Experience

The Report cites the reported lay rates of 70 to 80 joints per day achieved by spreads on the Western Leg and Western Delivery System in support of its adoption of the WBEC's lay rate estimate as superior to Alaskan Northwest's.¹ This is a misuse of the data, because terrain, weather, and soil conditions are much more favorable to construction of the Western Leg and Western Delivery System and smaller diameter pipe is being utilized. Thus, this lay rate experience is not indicative of what can be obtained in Alaska. Also, as previously discussed, these spreads experienced high rates of defective welds. This practice would not be cost effective in Alaska and would require leaving the ditch open an excessive length of time. Melting and ditch cave-ins would occur in permafrost areas.

5) Lay Rate Productivity Summary

In addition to the obvious errors in WBEC's "time and motion estimate" and the unexplained inconsistency between the three WBEC pipeline lay rate estimates for arctic construction, Alaskan Northwest questions how much reliance can be put on the judgment of WBEC, given that the individuals at WBEC who argue that 45 to 50 joints per day can be achieved have had no recent experience in the management and construction of major arctic projects.² The Report places total reliance on the WBEC lay rate estimate, with no weight given to the execution contractors assisting Alaskan Northwest who have far more arctic construction experience than WBEC. Alaskan Northwest recognizes that any estimate contains certain subjective judgments. Yet, objectivity in decision-making requires weighing and evaluating the judgments of all who have experience in a given field. To do otherwise taints the credibility of the conclusions reached. Alaskan Northwest submits that the evidence does not support WBEC's recommended lay rate reduction of \$172 million and that such recommendation must therefore be rejected.

b. Reductions of Crew and Equipment

1) WBEC's Reduction in Crews to Achieve its Estimated Lay Rate

Once an estimated lay rate was determined, Alaskan Northwest, Fluor, and the execution contractors established the crews and equipment required to meet that lay rate. WBEC would not only impose a higher lay rate, but also reduce

¹ Report at II-11.

² WBEC is involved in the business of designing and engineering projects, but does not participate in actual construction of such projects. Although prior to 1975 WBEC was a division of the Williams Companies, which had a separate construction division, the individuals of WBEC who performed the audit either did not work for the construction division, and therefore have no actual construction experience, or have little recent major arctic construction experience and little, if any, experience on TAPS construction management. See Appendix C, letter of Larry J. Bump, Chairman and President, Williams International Group, Inc., to R. N. Hauser, Vice President, Northwest Alaskan Pipeline Company, dated September 14, 1981.

all of the crews and equipment to be utilized.¹ As explained in our April 13, 1981 comments, even assuming a higher lay rate might be obtained, and assuming crews and equipment could be reduced, any such reductions must be limited only to the duration of those crews directly involved in pipe laying operations -- stringing, welding, firing line, coating, and insulation. The other crews were established independent of the lay rate estimate, a point WBEC seemingly does not now dispute stating that "...most pipeline lay operations require specific crews and equipment regardless of the progress rate."² The maximum cost reduction, assuming both a higher lay rate and a reduction in the above-referenced crews, is only \$16.87 million. Yet, WBEC still recommends reducing all pipe laying crews and equipment for its resulting \$172 million recommended cost reduction. Given WBEC's admissions its \$172 million recommended reduction must be rejected.

2) Optimization of Other Crews and Equipment

In its audit WBEC assumed that Alaskan Northwest did not optimize crews and equipment and recommends a \$195 million reduction to the pipeline portion of the CCE. WBEC's assumption is untrue. In constructing the CCE, crews were built to perform various work assignments, based on certain quantities of total production required, i.e. footage of pipe, cubic yards of gravel, clearing and grading, ditch excavation. Productivity rates for each crew were then established. An hourly rate was applied against these numbers of men and equipment, resulting in a cost for utilization of equipment during that specific period of time. These rates are based on recapturing 70 percent of the purchase price of a piece of equipment during its useful life on the project, not on its used life.

This method of computation within each spread of the pipeline system is a common practice in the construction industry and automatically optimizes the total equipment required for the project. Thus, when one operation is completed, another utilizing the same equipment begins and the equipment is automatically moved to that site and utilized there, thereby providing a leveling effect on equipment usage.

The construction work on various segments of the system will be performed concurrently by separate independent contractors. Since this work will be performed under fixed price contracts, equipment interchange between sections cannot be dictated by Alaskan Northwest. Moreover, it would be impractical to move equipment from Northway to Prudhoe for 3 or 4 days work in order to achieve an academic or theoretical leveling effect. In the real world, the concept of computation of crews on usage time only results in an automatic optimization within each segment.

As with the lay rate, the Report recommends total adoption of WBEC's recommendations on crew and equipment reductions and completely ignores the collective judgment of those execution contractors who assisted Alaskan Northwest and Fluor in establishing crew and equipment sizes. Again, the lack of objectivity

¹ WBEC recommends the crew size reductions even though it admits that such reductions may be directly contrary to the terms of current labor agreements.

² WBEC Vol. I at 1-50.

in the Report is apparent by the absence of any discussion of why the collective judgment of the Alaskan Northwest estimating team is wrong. Nor is there any discussion in the Report as to how crew and equipment reductions will permit accomplishment of the same work in a shorter time frame. The obvious answer is that it cannot. Accordingly, the recommended \$195 million reduction must be rejected.

c. Overhead and Profit

1) Execution Contractors

WBEC recommends that overhead and profit for the execution contractors be reduced from 18 percent to 15 percent, or \$105 million. In its March 1981 draft report WBEC attempted to justify this recommended reduction by alleging that: 1) "all of the risk (to the EC's) has been removed by low production rates;" and, 2) there is profit embeded in the CCE's equipment rental rate assumption that the execution contractors will recover 30 percent of the cost of new equipment through salvage value; that in fact the execution contractors will recover "60 percent" of the new value of their equipment due to escalation.

In its April 13, 1981 comments, Alaskan Northwest noted that: 1) WBEC's first justification was inconsistent with WBEC's prior assertions that productivity can be increased by reducing crews and equipment for many operations; 2) its second justification demonstrates a lack of understanding of Orders 31 and 31-B, which requires preparation of an estimate in base year dollars and prohibits any cost escalation therefrom; and, 3) it is inconceivable that an execution contractor would accept a 15 percent rate for overhead and profit given the requirement of the President's Decision that fixed price, not cost plus, contracts be utilized, and the fact that an execution contractor will have to commit all, or a substantial portion, of its management resources to this project alone.¹

In its final audit, WBEC does not now challenge Alaskan Northwest's first and third assertions. Instead, it bases its recommendation solely on the assumption that the execution contractors will recover 60 percent of the new value of equipment through escalation. Again, it is contrary to Orders 31 and 31-B to substitute inflated dollars for base year 1980 dollars. WBEC's argument demonstrates its lack of understanding of those orders and the IROR mechanism. Second, WBEC's conclusions are premised upon the fact that the salvage value of 2½ year-old equipment "in top condition" utilized in the lower 48 states will equal 60 percent of the original purchase price. It is without question that salvage values for equipment utilized in Alaska are less than those utilized in the lower 48 states, given the harsh arctic climate and terrain. WBEC responds to this point by stating that "...it will be mandatory that EC's maintain this equipment rigorously."² Alaskan Northwest agrees. Execution contractors in the lower 48 states also maintain their equipment "rigorously." The fact still remains that the wear and tear on equipment used 2½ years in the lower 48 states is far less than in Alaska, even where both are maintained "rigorously." TAPS and other recent arctic experience bears this out.

¹ April 13, 1981 Comments Vol. I at S-23 to S-24.

² WBEC Vol. III at 6-64.

WBEC responds to Alaskan Northwest's third assertion by gratuitously expressing its preference for an alternative bonus/penalty fee concept, but then states that this concept did not enter into its recommended reduction. We presume WBEC now agrees that the fixed price contract requirement will enter into the execution contractors' evaluation of the appropriate overhead and profit allowance.

Given WBEC's apparent agreement with two of the three prior points raised by Alaskan Northwest in its April 13 comments on the Draft Report and the illegality and factual incorrectness of WBEC's only remaining justification, the recommended \$105 million reduction must be rejected.

2) Subcontractors

WBEC also recommends reducing the subcontractors' overhead and profit for double jointing, thin film epoxy coating, and pipe insulation. Originally it based its recommendation on a belief that Alaskan Northwest made an error that was not corrected prior to filing, that the subcontractors' overhead and profit was intended to be identical to the execution contractors' overhead and profit allowance of 18 percent. WBEC was informed both at the Tulsa technical conference and in the April 13, 1981 comments that the correct figure was 25 percent not 18 percent, and that the 25 percent figure was obtained from subcontractors as their markup on current work. Nonetheless, WBEC refuses to withdraw its recommendation, but presents no new justification in support thereof. With no factual or historical basis that subcontractors would accept a reduction in overhead and profit for work on this project, vis-a-vis others, the \$15 million recommended reduction must be rejected.

d. Civil Quantities

WBEC alleges Alaskan Northwest's estimated civil quantities are excessive and recommends a \$124.8 million reduction in the CCE based principally on its own trench excavation and backfill analysis. WBEC bases its recommendations on the subjective judgmental differences between it and Alaskan Northwest on the amount of over-excavation that will be experienced relative to the neat design trench cross section, on measurement of yards of material to be mined, hauled and placed in bedding and backfilling, and on estimated hauling losses.

In its April 13, 1981 comments, as supplemented on June 2, 1981 following further technical conferences on this matter, Alaskan Northwest explained the purpose of the detailed design drawings prepared by the engineers and what those drawings represent, as compared to the cost estimates prepared from such drawings. The Alaskan Northwest and Fluor estimating team, including Morrison-Knudsen, Peter Kiewit, and Green Construction, all world leaders in civil construction, determined that the cost estimator must consider such factors as "the over-excavation necessary due to sloughing, bellholes at tie-ins, sidebends, water crossings, overbreak in the shot ditch, valve sites, and road crossings" which are not taken into account by the design engineers.¹

¹ June 2, 1981 Response of Alaskan Northwest Natural Gas Transportation Company to Materials Filed by State of Alaska Pipeline Coordinator and to Data Request of Williams Brothers Engineering Company at 3.

WBEC now "...agrees that quantities in excess of the design drawings will be necessary to construct a pipeline."¹ However, WBEC proceeds to prepare its own ditch design drawings, compares them to those of Alaskan Northwest, and concludes that the latter contain excess allowances vis-a-vis the WBEC drawings. The Alaskan Northwest estimating team has examined the WBEC design drawings and believe those drawings are not realistic -- they do not provide sufficient allowances that will be necessary during actual construction, allowances which were necessary for the TAPS civil construction. Accordingly, its recommended \$125 million reduction must be rejected.

2. Compressor and Metering Stations

The Report recommends a total reduction of \$25.6 million in the \$668 million contained in the filed CCE, as adjusted after the March 1981 technical conference, for the Compressor and Metering Station area. The Report's recommended reductions are based solely on the WBEC audit of the Compressor and Metering Station estimate. WBEC first audited the Compressor and Metering Station estimate as filed by Alaskan Northwest and recommend reductions of \$14.7 million. WBEC then recommended additional reductions of \$10.8 million based on special evaluations of alternative designs of certain items within the Compressor and Metering Station area. With the exception of a \$9.7 million reduction for reduced refrigeration capacity, WBEC's recommended reductions are unjustified, and the Report's adoption of those recommendations is an arbitrary substitution of WBEC's judgment for ours.

a. Reductions in Compressor and Metering Station Area

WBEC recommends a reduction of \$14.7 million in the Compressor and Metering Station area, as filed in the CCE. The vast majority of WBEC's recommended reductions, \$8.3 million, is based on differences in judgment between Alaskan Northwest and WBEC on how much vendor shop inspection is necessary and the staffing levels for the technical engineering staff in the field and for quality control at the compressor and metering station construction sites. The remainder is principally accounted for by WBEC's erroneous conclusion that \$4.9 million for testing of pipe welds had been provided for elsewhere in the compressor station estimate.

The recommended reductions in vendor shop inspection, quality control, and technical engineering staff are completely arbitrary and evidence a failure to grasp the complexity of this project. The levels provided for in the base estimate are necessary to ensure an adequate level of quality (as required by Federal Stipulations), effective management of construction, and cost control.

WBEC based the \$4.9 million reduction on its casual observation that "[t]he Outside Services estimate of \$4,927,000 for NDE inspectors appears to be a duplication of work contained in the piping estimate."² In fact, there was no duplication here. The alleged duplication is a continuing misunderstanding by WBEC of the Compressor and Metering Stations estimate.

¹ WBEC Vol. I at 1-72.

² WBEC Vol. II at 2-20.

The \$4.9 million covers non-destructive engineering tests (NDE) that will be performed, for the most part, on the high pressure gas piping in the compressor and metering stations. These tests, which include x-ray, magnetic particle, and dye penetrant tests, are necessary to assure the integrity of the welding. This testing is specialized and will be performed by an outside contractor. Of the \$4.9 million, \$2.3 million covers labor and \$2.6 million covers material, such as x-ray film, cameras, trucks on which to mount equipment, and trailers to develop film.

The NDE costs included in the piping portion of the compressor and metering station estimate do not duplicate the above testing. These NDE costs cover support services that the x-ray contractor will require, such as scaffolding for access to welds and utilities required by the contractor, including water and electricity.

Furthermore, the recommended reductions are inconsistent with recommendations made elsewhere in the Report and in the WBEC audit. For example, as a justification for reducing our Center Point allowance, the Report alleges Alaskan Northwest failed to incorporate opportunities for effective management to limit cost overruns in the filed CCE.¹ Yet, at the same time the Report uses this justification to reduce the Center Point, it takes away the tools essential for effective management contained in the CCE by arbitrarily reducing the number of vendor shop inspectors, quality control personnel, and supervisory engineers necessary to control costs on a project of this magnitude.

Given the proximity of WBEC's evaluation to our estimate, we believe the WBEC evaluation confirms the reasonableness of our estimate, particularly when the difference is attributable chiefly to differences in judgment. Moreover, the substitution of WBEC's judgment for that of Alaskan Northwest, whose estimators are much more familiar with the project, is arbitrary and totally unsupported. As the Commission recognized in its April 28 order approving Northern Border's CCE, items such as the level of construction supervision are for management judgment.² Therefore, the Report's recommended reductions of \$14.7 million should be rejected.

b. Special Studies Reductions

Although we concur in the recommended reduction of \$9.6 million in the CCE based on reduced refrigeration capacity, we disagree with the recommended elimination of \$3.1 million for refrigeration testing and recommended reductions of \$800,000 for full load, full pressure testing of compressors and \$445,000 requiring a change in metallurgy for flare stacks.³

¹ Report at III-15.

² April 28 Order at 102.

³ However, although we agree generally with reduced refrigeration capacity, we are not in complete agreement with the Staff on the necessary refrigeration capacity at each station.

1) Compressor Testing

The filed CCE includes \$1.1 million for full load, full pressure tests for each mainline compressor unit to be installed at the compressor stations. These units will be new systems including some new designs. As explained in our April 13, 1981 comments on the Draft Report,¹ such testing is necessary, in addition to component testing, to ensure the reliable operation of the units prior to shipment to Alaska. Full load, full pressure tests in the manufacturer's shop will allow as much debugging as possible to take place in the factory, where costs, such as labor rates, will be significantly less than in Alaska.

While WBEC concedes that the full load, full pressure testing we propose to have performed is prudent and the average cost of \$160,000 per unit we estimate for such tests is reasonable, WBEC arbitrarily decides that such tests are only required for two units. Consequently, WBEC recommends only \$320,000 for full load, full pressure tests for two mainline compressors. However, prudent management dictates that all seven units be thoroughly tested prior to shipment to Alaska. Because two units have been debugged provides no guarantee there will be no problems with the others. While later units may not require as thorough testing as early units, all units will require testing beyond component testing to assure that all of the subsystems within each unit operate properly. Our plan to test all seven units is a reasonable cost and quality control decision and our estimate of the costs for such testing is reasonable. In addition, the reduction recommended here is arbitrary and inconsistent given its obvious conflict with the Report's allegation that we failed to take advantage of opportunities to limit overruns. Therefore, the full amount of \$1.12 million should be approved.

2) Refrigeration Testing

Alaskan Northwest reduced its original estimate of \$28 million to \$3.1 million concurring with WBEC's recommendation to eliminate full load testing.² The Report recommends elimination of this \$3.1 million on the ground that WBEC found that the testing covered by the \$3.1 million had already been included in the base estimate for refrigeration equipment.³ The Report's recommendation, however, shows a complete misunderstanding of this issue. The Report's discussion on Page IV-19 confuses full load, full pressure testing for mainline compressors, which the Report and WBEC concede is appropriate, with such testing for the refrigeration systems (which also contain compressors). Actually, the basis for WBEC's recommendation was that the testing it covered was unnecessary, not that such testing had already been costed in the equipment estimate.⁴ Furthermore, WBEC's recommendation to eliminate the \$3.1 million is unjustifiable and would result in inadequate testing of refrigeration equipment.

WBEC's conclusion that component testing for the refrigeration systems is adequate and that the additional testing is unnecessary is unwarranted and

¹ April 13, 1981 Comments Vol. I at S-7.

² Id. at S-9 and Vol. II at 1-30 to -31.

³ Report at IV-19.

⁴ WBEC Vol. II at 2-27.

inconsistent with its recognition that full load, full pressure testing of the main-line compressor units is appropriate and its criticism that we have failed to optimize resources.¹ The sub-system testing we propose is the most prudent approach to ensure that all equipment works in accordance with specifications and to minimize the possibility of cost overruns resulting from installation of a novel refrigeration system in a remote location. As much debugging as possible must be done in the shop in order to avoid the significantly higher cost of remedial work in Alaska. These refrigeration systems cannot be purchased "off-the-shelf". Unlike most refrigeration systems, these must be able to operate in two modes: refrigeration and free cooling. During the refrigeration mode the system operates similar to a conventional system, except that, instead of delivering a constant amount of refrigeration, it must be able to vary the amount of refrigeration produced depending on how much cooling capacity is required on a given day. In the free cooling mode, the system takes advantage of low ambient air temperatures in Alaska to conserve energy by turning off the compressors and circulates the refrigerant through the system by means of a pump.

Because the testing covered by the \$3.1 million is reasonable and cost effective, the \$3.1 million for refrigeration testing should be approved.

3) Flare Stack Metallurgy

The WBEC evaluation recommends that nickel alloy steel instead of stainless steel be used in the flare stacks at the compressor stations, except for the tips of the stacks, which would remain stainless steel. According to WBEC, this change in metallurgy will result in a total cost saving of \$455,000.² Alaskan Northwest used stainless steel in the design for the flare stacks because, at the time of the CCE filing, Alaskan Northwest was confident this design would work. WBEC has not demonstrated the feasibility of its alternative design or that it would result in savings. Alaskan Northwest still believes its design to be technically feasible and cost effective.

In summary, the appropriate base estimate value for Compressor and Metering Stations is \$658 million.³

3. Operations and Maintenance Facilities

The Report adopts WBEC's recommended reductions of \$2.5 million in the base estimate of \$53 million for Operations and Maintenance Facilities, because it found the WBEC reductions reasonable.⁴ But, the Report also found that Alaskan Northwest's estimate of project costs was reasonable. The blind substitution of WBEC's evaluations for Alaskan Northwest's estimate is arbitrary and

¹ See, e.g., Report at III-15.

² WBEC Vol. I at 1-100.

³ This value is our reconciled value of \$668 million including \$3.1 million for the refrigeration testing described above, less WBEC's figure of \$9.7 million for reduced refrigeration capacity and miscellaneous reductions of \$30,000.

⁴ Report at II-16.

evidences a single-minded determination to reduce the base estimate even though the estimate is admittedly reasonable and WBEC's recommendations are unsupportable.

For example, one of the largest of WBEC's recommended reductions in the O&M area is a \$1.5 million reduction in pre-commissioning costs. This is based on WBEC's estimate of 480 man-months. However, WBEC also states that the real basis of its estimate is 13 crews of 12 men each for a four-month duration.¹ A simple calculation (13 X 12 X 4) shows that the WBEC evaluation is 624 man-months (not 480). As clearly stated in the filed CCE the workweek at a construction site is 70 hours long; however, WBEC used 52 hours per week. These two WBEC oversights change their evaluated manhours from 108,144 to 189,000 (624 man-months X 303 manhours per man-month). This exceeds the filed CCE value of 162,240 manhours. This simple analysis of WBEC's evaluation clearly shows this determination to reduce the estimate when there is no objective basis therefore and even when their backup indicates an increase.

Consequently, Alaska Northwest recommends that the Commission approve the filed base estimate of \$53 million for O&M.

4. Communications and Supervisory Systems

WBEC agrees with the base estimate CCE for the communications and supervisory systems area.² However, the Report recommends that approval of a CCE value for communications be deferred until Alaskan Northwest submits a more detailed design and cost estimate for this item. We agree with this procedural recommendation and are in the process of developing a detailed communications cost estimate, which will be submitted for CCE approval in the near future.

5. Temporary Facilities and Services

Alaskan Northwest is requesting a CCE value of \$900 million for Temporary Facilities and Services, including \$439 million for camps.

The Temporary Facilities and Services base estimate includes costs for the purchase, renovation, and, where necessary, relocation of Alyeska camps for use by all personnel in the field during construction of the pipeline and compressor and metering stations. The CCE does not, however, contain any estimated costs for construction of either new camps or new campsites. Although the CCE filing is based on purchasing the Alyeska camps, purchase negotiations between Alaskan Northwest and Alyeska have terminated. Alaskan Northwest is therefore continuing to seek government permits to use existing campsites and is preparing a revised camp estimate based on the estimated costs of new camps. Also, although Alaskan Northwest submitted permit applications in the Fall of 1978 for 10 campsites on Federal lands, and substantial additional information relating to these applications was submitted to the government in May 1981, the permits still have not been issued. The Bureau of Land Management of DOI advised Alaskan Northwest by letter dated September 11, 1981 that several of the campsites are

¹ WBEC Vol. II at 3-8.

² WBEC Vol. I at ES-5.

not approved for future use pending further consideration of other options.¹ Notwithstanding these developments, Alaskan Northwest is, in partial agreement with the Report's recommendation that the Temporary Facilities and Services portion of the CCE not be delayed by the breakdown in negotiations and delay in permits. The Commission can go forward with consideration of the CCE value for Temporary Facilities and Services based on Alaskan Northwest's filing.

If there are no further developments in the camp purchase negotiations, Alaskan Northwest will submit a revised estimate for new camps at the appropriate time. If this submission occurs prior to Commission approval of the CCE, it should be treated as an amendment to the CCE filing analogous to our October 1980 amendment reflecting the 200 foot separation from TAPS required by the DOI Right-of-Way Grant. If submission is after approval of the CCE, the submission will be to the Federal Inspector, and the revised estimate should be eligible for treatment as a design change, contrary to the Report's recommendation that a change to new camps not qualify as a design change, because any cost difference between existing and new camps "...would be considered to be a change in price and, as such, would not be eligible for a CCE adjustment pursuant to Condition 9..."² As more fully explained in the section of these comments concerning the design change mechanism, the Report's recommendation is without any basis in fact or the Commission's IROR orders. A change from existing camps to new camps, possibly at new locations, is obviously a change in design, techniques, and quantities and not merely a change in price.

Turning then to the Report's treatment of Alaskan Northwest's reconciled CCE estimate of \$909 million for Temporary Facilities and Services, the Report recommends reductions of \$41 million based upon WBEC's audit.³ Alaskan Northwest agrees with only \$8.2 million of the recommended reductions. As explained below, however, \$32.8 million of the recommended reductions are without any basis.

a. Craft Labor Productivity

The principal basis of WBEC's reductions to Alaskan Northwest's estimate for camps was higher labor productivity assumptions.⁴ No one, including WBEC, questions the fact that a significant decline in labor productivity in the heavy

¹ Letter from Curtis McVee, Alaska Director, BLM, to Harold W. Moles, Vice President, Northwest Alaskan Pipeline Company, dated September 11, 1981. See Appendix D.

² Report at IV-10. Alaskan Northwest is also in disagreement with the Report's statement that the CCE for camps can be set at this time "...because the filed estimate includes a substantial amount of contingency related to the costs of providing camps..." Report at 11-15 n. 44. This statement is factually incorrect. The contingency for Temporary Facilities and Services was designed to cover uncertainties in estimating the costs of renovating existing camps, not the costs of designing and building new camps. In addition this contingency covers uncertainties in estimating the other components of Temporary Facilities and Services, including, for example, transportation and revegetation.

³ Id. at 11-15.

⁴ WBEC Vol. I at 1-16.

construction industry has occurred from 1961-63 to date. Yet WBEC contends that the craft labor productivity contained within the 1961-63 U.S. Gulf Coast manpower estimates should be adopted as the productivity in Alaska during the temperate months in 1982-83. Accordingly, WBEC recommends an \$18.9 million dollar reduction.¹ Alaskan Northwest believes WBEC may have meant to correct its final audit and withdraw this recommended reduction, because WBEC accepted a similar adjustment for labor productivity in the Compressor Stations estimate. Furthermore, the labor productivity used for the camps was increased over the value used for Compressor Stations in order to account for camp work being done during more temperate months and under less congested working conditions. Thus, Alaskan Northwest's labor productivity assumptions used in preparation of its camps estimate are consistent with productivity assumptions underlying the Compressor and Metering Station area and both are correct and should be affirmed. Conversely, the recommended reduction of \$18.9 million should be rejected.

b. Cost of Borrow Material/Haul

WBEC reduced the estimated unit cost for gravel used in camp construction from \$17 per cubic yard to \$15 per cubic yard, which is the unit cost we estimated for gravel in the pipeline area of the CCE. WBEC's justification was that the increase from \$15, which value WBEC accepts, to \$17 was unexplained.⁴ We, however, did explain that gravel used in constructing the camps will have to be hauled longer distances on average than borrow material used in pipeline construction.⁵ Borrow material for the camps will have longer average haul distances because camp construction will begin prior to pipeline construction and fewer gravel pits will be available at the time of camp construction.

The difference in transportation costs for gravel between camps and other areas of the CCE justifies the higher unit cost of \$17 per cubic yard for gravel used in building the camps. Thus, the Commission should reject WBEC's erroneous recommended reduction of \$2.8 million in borrow costs.⁶

c. Foundation Cribbing Manhour Rates

The crew manhour rates for cribbing, which is the construction of timber foundations for the temporary buildings to be used in the camps, was derived from Means, a standard estimating handbook. Because there is no rate in Means for timber cribbing, we utilized the Means rate for a similar construction task,

¹ WBEC's reductions in craft labor total \$18.9 million. See WBEC Vol. II at 4-40 (\$5.5 million), 4-44 (\$8.2 million), 4-47 (\$690,000), and 4-52 (\$4.5 million).

² April 13, 1981 Comments Vol. III at 6-2.

³ WBEC Vol. III at 6-16.

⁴ Id. at 4-29.

⁵ April 13, 1981 Comments Vol. III at 4-39.

⁶ WBEC Vol. II at 4-30 (\$475,800), 4-42 (\$1.2 million), and 4-49 (\$1.14 million).

concrete forming. To this rate we applied the productivity factor of 1.53, which is the productivity factor indicated by Means for this activity in Anchorage, Alaska.¹ WBEC claims that the use of this factor was inappropriate because it is a wage and material adjustment factor, not a productivity factor.² The simple answer is that WBEC has misread Means. Means shows separate factors for labor productivity (installation) and materials for concrete form work in Alaska.³ The labor productivity factor listed therein is 1.532. That this is a productivity, rather than a wage and material factor, is also shown in the explanatory text of Means.⁴ Thus, there is no basis for WBEC's rejection of Alaskan Northwest's labor productivity factor for cribbing, and the Commission should reject the WBEC's erroneous recommended reduction of \$1.7 million.⁵

d. Other

Of the remaining \$16.5 million in WBEC recommended reductions, Alaskan Northwest agrees with \$8.2 million which principally results from the deletion of costs for freight and handling for revegetation materials.⁶ Alaskan Northwest does not agree with \$8.3 million of WBEC's reductions, which are less than 2 percent of our estimate. Because of the valid basis for our estimate and deficiencies in certain of WBEC's audit as described below, these reductions should also be rejected.

The contested balance of the recommended reduction of \$8.3 million includes a \$7.1 million reduction in the PMC expenses in Alaska for reprographics, communications, and expendables. Alaskan Northwest has provided additional backup for these cost items, including actual costs incurred to date by the PMC. The WBEC recommendation totally ignores this material. Our estimate for these items for Alaska is one-half our estimate of the same items for Irvine. Even though the PMC's actual expenses to date are exceeding the estimated expenses, WBEC recommends reducing the estimate. It simply does not make any sense to reduce an estimate when actual cost experience shows the estimate is already too low. This again demonstrates how arbitrary the recommendations are.⁷

¹ April 13, 1981 Comments Vol. III at 4-41.

² WBEC Vol. II at 4-34 to -35.

³ Means (1981 ed.) at 290.

⁴ Means (1981 ed.) at 299.

⁵ WBEC Vol. II at 4-35 (\$593,000), 4-46 (\$27,460), and 4-51 (\$1.07 million).

⁶ The \$8.2 million actually results from several WBEC upward and downward adjustments to the CCE with which Alaskan Northwest agrees as follows: downward adjustments of \$8.59 million for freight and handling of revegetation materials (Id. at 4-9) and \$50,000 in EDP equipment (Id. at 4-21); upward adjustments of \$12,000 in Intermediate Pipe Storage Yards (Id. at 4-25), \$455,000 in Land and Land Rights (Id. at 4-26), and \$193,000 in other Alaska Offices (Id. 4-57 and -58).

⁷ It also shows the bias to reduce the estimate. While WBEC elsewhere relies on events subsequent to the CCE filing to reduce the estimate, it refuses to consider such information where it could mean leaving the estimate as is or increasing it. See infra at page 36.

6. Project Directorate

The proposed CCE value for Project Directorate, as adjusted after the March 1981 technical conference, was \$1.26 billion. Of this amount, the Report recommends that \$225 million, representing the monitoring and socioeconomic costs submitted by the State of Alaska, be deferred for further subproceedings.¹ Of the remaining \$1.0 billion audited by WBEC, the Report recommends that WBEC's reductions totalling \$92.7 million be adopted. Most of these reductions are in project management (\$38 million), taxes (\$25 million), and insurance (\$28 million). As explained below, there is no basis for the recommended reductions, and the appropriate base estimate value for Project Directorate, is \$1.25 billion.

a. Project Management

The project directorate costs for Northwest Alaskan and the PMC are estimated to be \$485 million. The Report recommends deferral of this item because OFI has not finally approved the management plan and, therefore, deferral is required because of the authors' view "...the management plan cost estimate, absent other events, should not be subject to alteration once approved in the CCE...."²

There is no basis in the President's Decision or the IROR orders for deferring approval of a CCE value for management costs. The President's Decision requires that "[p]rior to the issuance of the certificate, the successful applicant shall provide a detailed overall management plan, to be approved by the Federal Inspector, for the preconstruction and the construction phases of the transportation system project."³ After numerous conferences between Alaskan Northwest and OFI personnel, Alaskan Northwest on June 2, 1980 transmitted the final draft of its Management Plan (dated May 30, 1980) to OFI. On June 6, 1980, OFI transmitted a letter to Northwest Alaskan stating "[t]he overall management framework and principles established in the May 30 draft are acceptable and approved."⁴

Additionally, WBEC's audit of the CCE corroborates Alaskan Northwest's management cost estimate. WBEC found that the CCE filing presented a comprehensive management philosophy.

There is no requirement that all detailed aspects of the management plan be approved prior to approving project management costs. The management plan is a "living document" which reflects the stage of the project. Thus, it would be unreasonable to expect that a complete and detailed overall management plan be ready at the stage of the design at which the CCE filing was prepared. Further, the Federal Inspector's approval in principle of our overall management plan and

¹ Report at II-13 and n. 39. The Report recommends deferral of \$203 million of socioeconomic costs and \$22 million of monitoring costs.

² Id. at IV-7.

³ President's Decision at 27.

⁴ See Appendix E, letter from John T. Rhett, Federal Inspector, signed by Peter L. Cook, to Darrell B. MacKay, Northwest Alaskan Pipeline Company, dated June 6, 1980.

WBEC's audit confirms the reasonableness of our estimate and provides a sufficient basis for approving a CCE value for the project management costs now.

Finally, the Report asserts that changes to the management plan cannot qualify as design changes. Management costs can be impacted where there is a design change and any such cost impact should be reflected in an adjustment to the CCE pursuant to Condition 9 of Order 31 along with the adjustment for the design change itself and that the management cost estimate is now ripe for approval.

In WBEC's audit of Project Directorate, WBEC recommends that the base estimate for project management be reduced by approximately \$38 million, \$9.7 million in the PMC's estimated costs and \$28.6 million in Northwest Alaskan's estimated costs.

1) PMC

Of the \$9.7 million recommended reduction for PMC costs, \$4.0 million in reductions in home office expenses, benefits and burdens, and PMC's finance staff is unwarranted. For example, WBEC recommends reductions of \$0.9 million in the PMC's Irvine office expenses, such as expendables and overhead and fee, on the basis the the Northwest Alaskan/PMC contract specifies a lower rate for these items than those contained in the CCE filing. The CCE estimates for these items, however, were based on the interim contract between Northwest Alaskan and the PMC, which was the only basis for establishing an estimate at the time of preparation of the CCE. For WBEC to now substitute the rates specified in the final NWA/PMC contract entered into subsequent to the CCE is like substituting actual for estimated costs, which is inconsistent with the Report's position that the CCE be based on estimated costs.¹ The \$0.3 million deduction in finance staff and expenses² and the \$2.8 million deduction for methodological difference in Irvine manhour extensions and recovery for days off³ must not be made.

The PMC maintains that the PMC manhours included in the CCE were developed based on job requirements, organization charts, and job durations, and the man-hours required to accomplish specific tasks (such as drawings, specifications, flow sheets, and calculations). These manhours were calendarized for manpower planning (office space, hiring requirements, cash flows) by equating the manhours to equivalent people using a division of 36 hours per week. Since paid time off is frequently offset by additional overtime, for estimating purposes there is no methodological difference.

2) Northwest Alaskan

None of WBEC's recommended \$28.6 million reduction in NWA's project management costs is justified. WBEC fails to grasp the magnitude of NWA's role as operator for the Alaskan Northwest partnership and the complexity of the project.

¹ Alaskan Northwest agrees with this position except where it has no control over costs such as government-related costs.

² WBEC Vol. IV at 7-15 to -20.

³ Id. at 7-5 to -7 and 7-15.

A principal assumption underlying WBEC's conclusion that NWA's staffing levels are too high is that NWA is merely going to oversee and monitor the performance of the PMC. This is not the case. In addition to supervising the PMC, NWA's management responsibilities include financing, obtaining all necessary government permits, licenses, and certificates, acquiring rights-of-way, accounting, auditing quality assurance and quality control, public relations, and government liaison. Moreover, because of the unique nature of this project, there will be an unprecedented amount of government oversight, and NWA is responsible for responding to the needs and requirements of government agencies monitoring the project.¹ NWA must also respond to and coordinate the views of the ten-member partnership and the Design and Engineering Board. WBEC fails to comprehend the full scope of these responsibilities, which are far greater than those normally undertaken by the operator on a regulated utility project.

Furthermore, where WBEC's reductions are based on its subjective judgments and rule of thumb allowances, NWA's estimated costs are based on its actual historical experience. Our estimate is justified by our CCE filing and our April 13, 1981 comments,² which WBEC's audit fails to address and which the Report ignores.

For example, WBEC recommends the duties of the Records and Data Management staff in the Salt Lake City office be combined with and performed by the receptionist, courier, and administrative assistant. This naive suggestion demonstrates a complete lack of understanding of the complex and extensive records management program required for this project, a program fully endorsed by the Federal Inspector.

WBEC reduces the Alaskan Northwest financial staff on the basis that their functions will be performed by the PMC supplemented by computer software to convert cost data for accounting requirements. This argument again reflects a lack of comprehension of the complexity of the financial affairs of NWA. WBEC ignores the demands on the owner's financial department created by a multi-billion dollar project.³ To reduce this staff is unrealistic in the face of what will be the most costly pipeline project ever built.

¹ See, e.g., the various terms and conditions of the President's Decision imposed on the Alaskan Northwest partnership and its operator, Northwest Alaskan.

² April 13, 1981 Comments Vol. III at 7-120 to -133.

³ For example, these demands flow from the following:

- 1) The fiduciary role of Northwest Alaskan as operator for a complex, multi-company, multi-billion dollar partnership requires continuous contact with the members of the partnership;
- 2) Requirements will be placed on the Operator by various institutions in the financial community to maintain a continuous reporting and communication network on the budget and financial position of the project;
- 3) The audit interface between government, owner, and public entities will surpass anything yet experienced by any project of this magnitude.

WBEC recommends reductions in three other areas -- General Services, Management Information Systems and Permit Acquisition -- on the basis that the PMC will provide these services. This recommendation ignores the complexity of the Management Information Systems necessary to support a project of this magnitude. A MIS from construction phase to operation phase must be performed by Owner/Operator personnel. While the PMC supports Northwest Alaskan's responsibility for all permit acquisitions, the final preparation, submittal, and interface with permitting agencies is the responsibility of Northwest Alaskan, not the PMC.

WBEC argues that operator camp staff should not be maintained during the winter months on the basis that a high turnover will occur each fall and that Northwest will hire and train new staff each spring. Alaskan Northwest will be exposed to costs whether the staff remains on during the winter or if turnover occurs since maintenance work is required during the winter. Additionally, WBEC's recommendation actually requires more costs for recruitment and training not included by Alaskan Northwest in its filed CCE. Thus, the costs to the sponsors will be similar whether staff remains in camp over the winter or NWA recruits and trains a new staff.

b. Taxes

WBEC suggests an overall reduction to the tax estimate based on the ratio of the total WBEC evaluated estimate to the CCE. At the outset we would note that WBEC's recommended reductions to the overall tax estimate must be rejected to the extent the Commission determines that the requested CCE values, not the values recommended in the WBEC audit, should be approved.

WBEC recommends that the CCE be reduced for the effects of a change in Alaska tax law which transpired subsequent to the date of the CCE filing. While it is true that the law was changed, the premise in Orders 31 and 31-B that the CCE be based on law existing at January 1, 1980 must be maintained. Alaskan Northwest finds it difficult to reconcile how the Report can accept this "tax law change" and reduce the CCE, but then recommend that changes in tax laws not be given design change treatment.

It is essential to recognize that taxes are non-controllable costs. As witnessed during the period since the CCE was filed, legislative bodies can and do change tax laws. Administrative bodies interpret, administer, and enforce tax laws and ordinances in an ever-changing manner. The Commission should not, as the Report recommends, penalize the project for any such changes. Alaskan Northwest asserts that legislative, interpretive, and administrative changes to tax laws must be treated as design or scope changes.

c. Insurance

WBEC recommends reducing insurance costs in the CCE by some \$28 million, but provides no support for the rates it proposes. The rates utilized by Alaskan Northwest in preparation of the CCE were determined by contacts with the actual markets which will provide insurance. However, WBEC fails to indicate whether brokers can and will underwrite at its lower rates. Therefore, its unsubstantiated opinions should not be adopted.

1) Excess Umbrella Liability Insurance

WBEC attempts to estimate by rule of thumb the appropriate Excess Umbrella Liability premium estimate. This is an invalid approach because: a) estimating excess liability premiums as a function of primary liability premiums on this particular project is not appropriate since we utilized a primary general liability factor approximately 700 percent lower than the rates that would have been produced had manual rating been used; b) excess Umbrella Liability underwriters on this project are dealing with known catastrophic exposures which could produce a policy limits loss; and, c) the Excess Liability Insurance must conform to the Mutual Indemnification Agreement which imposes many areas of strict liability and provides stringent requirements with respect to pollution coverage. Underwriters' acknowledgement and adherence to the Northwest Alaskan/TAPS Mutual Indemnification Agreement requires much broader coverage than that which would be required under a normal excess umbrella program.

2) Aircraft Liability

WBEC's estimated rate of \$3,000 per aircraft year is not substantiated by a London desk quote. The \$5,000 figure used in the CCE is substantiated by such a quote.

3) Ocean Marine Shipments

WBEC attacks the rate of 1 percent and advocates use of .7 percent, but offers no underwriting source for that rate. This is a rather small percentage difference, but when applied to a \$2.5 billion base, the effect is quite profound. In addition to the rates quoted by Reed Stenhouse, the 1 percent rate was also advocated by Fluor's insurance broker, Johnson & Higgins, for marine shipments between West Coast ports and southern Alaska ports. While the 1 percent rate is endorsed by two major insurance brokers, the WBEC rate is unsubstantiated by any knowledgeable insurance sources.

4) Inland Marine Shipments

WBEC again does not have any underwriting source that will write the insurance at its recommended lower premium rate.

5) Aircraft Hull Insurance

WBEC recommends utilization of a .5 percent of value rate as opposed to the .7 percent utilized for the CCE. Alaskan Northwest is not able to write lower 48 aircraft hull insurance for a .5 percent of value rate, let alone Alaskan based aircraft. WBEC again does not reveal the underwriting source for insurance at the premium rates quoted. Alaskan Northwest would note that Northwest Energy's current fleet hull rates are .73 percent to 1.50 percent for aircraft based in Utah.

6) Physical Damage Construction Camps

The CCE utilizes a .35 percent rate applied against the base value of the camps. This rate was obtained by contact with the American Insurance Group, a potential insurance underwriter. WBEC's recommended rate is not supported by any potential market. These properties have little or no fire detection or

suppression equipment, and firefighting is of little effect. Underwriters would regard these as unprotected properties and would certainly surcharge base rates because of their status.

7) Builder's Risk

Alaskan Northwest utilized a .6 percent estimate rate for the CCE applied to actual values at risk. WBEC proposes a .322 percent estimate based on a rule of thumb method of 55 percent of completed value. Since the CCE estimate was a result of contacts with prospective markets and was applied against actual values, the method is much more reliable than WBEC's unfounded estimate.

C. Normal Contingency

As previously explained Alaskan Northwest followed a very precise definition for normal contingency evaluation. Through a probabilistic analysis a value of 12 percent was determined as appropriate after evaluating the possibility of cost increases or decreases from the base estimate. Williams Brothers by a process which it does not fully define arrived at approximately the same value, 12 percent, for its estimate.

However it is essential to point out that were Alaskan Northwest to assess a contingency for the WBEC evaluated estimate using the same precise definition of contingency as the CCE, it would arrive at a value considerably above 12 percent. A 12 percent contingency is not realistic considering the overly optimistic production rates in WBEC's evaluated estimate. Human productivity assumptions are a significant aspect of the precise definition of our contingency category. The combination of reduced crew and equipment size coupled with higher productivity would dramatically increase our contingency because the likelihood of sustaining production would be jeopardized. WBEC's evaluation resulted in transferring expected values from Center Point to contingency thereby in effect increasing its 12 percent contingency and reducing the Center Point. Alaskan Northwest disagrees with this assigned contingency concept as explained in the following section. However, it must be recognized that the abnormal events involved in this assignment by WBEC do not offset the optimistic productivity assumptions of WBEC.

D. Center Point

Alaskan Northwest's Center Point request of 1.28 was based on an analysis prepared in accordance with Orders 31 and 31-B and the following instructions from the Commission:

The exhibit dealing with the Center Point should assess the likelihood of abnormal events that could increase costs which are not covered under the Change in Scope mechanism and the impact on costs that these events would have. This information will be used to set a Center Point that compensates for the possibility of abnormal events increasing costs.¹

¹ Order 31-B at 8.

The Report essentially concedes that the Center Point analysis is in accordance with Orders 31 and 31-B.¹ However, it disagrees with the result reached and, therefore, recommends a Center Point of 1.20, based on other considerations such as the cost growth experienced to date, a comparison with TAPS, and the opportunity to limit overruns.² These extraneous considerations do not support the Report's recommendations. If anything they support the Center Point request. Moreover, the Report's criticism of the Center Point analysis prepared by Alaskan Northwest is without merit.

1. Other Considerations Do Not Provide a Basis for Reducing the Center Point

The Report supports its conclusion that our Center Point request is not risk neutral by resorting to arguments that 1) most of the cost growth that can be expected has already occurred; 2) experience with other projects suggests that we will not experience significant additional cost growth beyond that projected in our filings; and, 3) effective management can limit such overruns as they occur. None of these contentions are valid or provide support for the Report's recommended reduction in Alaskan Northwest's Center Point.

a. Cost Growth to Date and Experience with Other Projects

The Report contends that significant growth has already occurred since the March 1977 estimate and further cost growth may qualify as a design or scope change. Therefore, the likelihood of cost overruns in excess of a CCE adjusted to reflect such design and scope changes has been reduced. However, as experience with other large projects shows, significant cost growth can, and does, occur after final design. The Report's contention that the design and scope change mechanisms can be used to adjust the target costs for the project to reflect any such cost growth is fallacious, because under the Report's interpretation of the design change mechanism, there are not likely to be many, if any, upward adjustments in the CCE to reflect approved design changes; and, as previously discussed, design refinements are extremely unlikely to qualify as scope changes.

¹ Report at III-1.

² In recommending a Center Point of 1.2 the Report inexplicably concludes that

...expected further cost growth [will] be considerably less than that anticipated at the time of the President's Decision and thus, that the Center Point be considerably less than 1.3. Report at 9.

This statement appears to form the foundation for the Report's entire Center Point analysis. Alaskan Northwest fails to see any relationship between the 30 percent figure used in the President's Decision and the Commission's mandate in Order 31-B that the Center Point be based not upon the 30 percent figure, but on the expected value of abnormal events which could increase project costs. In that order the Commission did not state that the ceiling for the expected value of abnormal events was 30 percent.

The Report cites experience with cost growth on other major projects as a basis for reducing our Center Point request.¹ The Report, however, does not actually attempt to compare these projects and their history of cost growth with the Alaska segment. In fact, the Report does not even identify, let alone discuss, the other projects, with the sole exception of TAPS.

Even assuming that TAPS is comparable to the Alaska segment for the purpose of establishing the Center Point, the Report's attempts to compare TAPS immediately prior to construction with this project at a 5 to 10 percent design stage is indefensible.

b. Opportunities to Limit Overruns

The Report contends the availability of management opportunities to limit cost overruns is a basis for reducing our requested Center Point.² The Report cites the body of Alaska construction experience, including contractors with arctic experience and the TAPS owners, which experience we can draw on to limit overruns, and suggests that we failed to take advantage of that experience with its statement that "...Alaskan Northwest's apparent failure to incorporate certain opportunities to reduce costs in preparing the CCE Filing is one of the major weak spots in the Filing."³ The Report is essentially saying that our Center Point can safely be reduced because our base estimate is too high. The Report ignores the fact that under Orders 31 and 31-B the opportunity to limit overruns is not relevant to setting the Center Point, because the Center Point is designed to compensate for the cost impacts of abnormal events beyond the sponsors' control.

The irony of the Report's "lost opportunities" argument is that we in fact utilized the best of the very arctic experience cited by the Report in preparing our base estimate, and the Report repudiated that experience, substituting the authors' or WBEC's own subjective judgment instead. Both the Project Management Contractor, Fluor, and the operator for Alaskan Northwest, Northwest Alaskan, have people in virtually every organizational discipline with arctic experience. In addition, consultants hired by both the PMC and Northwest Alaskan have been involved in construction or engineering in Alaska since the beginning of TAPS. To design the project and assemble the CCE filing we drew upon the experience of personnel who worked with the execution contractors that constructed all spreads of TAPS and who have since constructed most of the other energy-related projects on the North Slope of Alaska. We also purchased an extensive amount of data from Alyeska to aid in the design of the gas pipeline system. Furthermore, the producer members of the Design and Engineering Board are TAPS owners and experienced North Slope operators and have approved the completeness and reliability of the CCE and Center Point as a measure of the expected costs of the Alaska segment. Thus, contrary to the Report's assertions, we have already applied reasonable resource optimization in preparing the CCE, which has been shown to be both realistic and reasonable.

¹ Report at III-8.

² Id. at III-15.

³ Report at III-15.

2. Alaskan Northwest's Center Point Analysis is a Sufficient Basis to Establish the Center Point

The above factors relied upon by the Report obviously do not provide any support for setting a Center Point lower than that requested by us. Therefore, if our Center Point is to be reduced, it must be on the basis of defects in our analysis of abnormal events, prepared in accordance with Orders 31 and 31-B. The Report attempts to show our analysis is too subjective for establishing the Center Point, but does not particularize its claims other than to argue that we have misclassified as abnormal events certain items that should be in contingency; certain of our abnormal events cover unanticipated increases in inflation already compensated for by the IROR inflation adjustment mechanism; and, our allowance for cost impacts from unknown events should be eliminated. None of these contentions are warranted.

a. Elimination of Unknown-Unknowns is Arbitrary

The inclusion of an allowance of \$490 million for potential costs attributable to unknown impacts, referred to as "unknown-unknowns," was reasonable, because of the unique size, complexity, and location of the Alaska segment. We know that we cannot anticipate every abnormal event that could cause cost overruns beyond our control. The risk of cost uncertainty from such unknown-unknowns is covered by Event No. 36 in our Center Point analysis.¹

Unknown-unknown events can and do occur even in traditional projects as well as first generation or higher technology projects. Unknown-unknown events as a likely source of potential cost overrun for this project was first identified for the Commission by Mr. James D. McCullough of the Institute for Defense Analysis.² There are many examples of unknown-unknowns occurring in traditional projects, e.g., the recent incident of a drilling rig under contract to Texaco drilled into a salt mine in Louisiana draining a small lake; the creation of earthquake swarms near the Rocky Flats Arsenal in Colorado due to the subsurface injection of radioactive wastes; the discovery of the snail darter fish which delayed the Tellico Dam Project; and the failure of the frames of new Grumman Flexible Buses. Furthermore, a report by the Rand Corporation on project cost growth shows that the filed value for unknown-unknown events is reasonable.³ This report states that exogenous (abnormal) events and scope changes (which are very narrowly defined under the IROR orders) are primary contributors to cost growth. Further, this study compares the ratios of actual to estimated costs for over 200 traditional and non-traditional projects. In this analysis, even

¹ CCE Vol. V at 4-38.

² "On the Treatment of Risk and Uncertainty in Determining Change in Scope Allowability and Center Point Establishment in the Alaska Gas Pipeline IROR Mechanism," James D. McCullough (Institute for Defense Analyses Paper P. 1413), March, 1979.

³ See Rand Corporation, "A Review of Cost Estimation in New Technologies: Implications for Energy Process Plants" (July 1979).

highway projects, which should have very low uncertainty, have an average ratio of 1.26 times the estimated cost.¹

The Report does not deny the existence of unknown-unknowns or that they can impact this project, but recommends no allowance for unknown-unknowns because they cannot be quantified with any certainty.² This recommendation is inconsistent with the Report's general concern that our 36 Center Point events, including unknown-unknowns, do not account for all possible sources of cost overruns.³ The Report's statement that elimination of an allowance for unknown-unknowns will give "...a better assessment of the range of identifiable cost uncertainty facing the project at this stage of design and construction planning"⁴ cannot be reconciled with its concern that "...any number of unanticipated or inadequately anticipated events could cause a cost overrun allowed for by approving a Center Point in excess of 1.0."⁵

Merely because an event is difficult to estimate is not a reason for ignoring the admittedly potential cost consequences of that event. While WBEC agrees that it is impossible to estimate unknown-unknowns with certainty, it "...accepts the philosophy that unk-unks do pose a risk to large, unique projects such as the NWA pipeline...",⁶ and recommends an allowance of \$239 million for unknown-unknowns.⁷

WBEC's reduction of our value for unknown-unknowns is based on the ground that some unknown-unknowns will be presented as design or scope changes.⁸ However, as previously explained,⁹ potential design and scope changes were excluded from consideration when determining the Center Point

¹ Alaskan Northwest first estimated that unknown-unknowns based upon historical evidence would be at least 25 percent of the CCE at the 5 to 10 percent design stage. Alaskan Northwest recognized that most experience is based on cost-plus projects without the IROR mechanism and, therefore, with less incentive to attempt to anticipate events. Alaskan Northwest, because of the significant effort employed to anticipate "abnormal events" made a conservative estimate, determine that it could be conservative in its estimate of unk-unks and, therefore, cut the unk-unks in half to 12.5 percent. Alaskan Northwest then considered 12.5 percent to be the extreme of the range for unk-unks with a mid-range value of 6.25 percent. This value has to be considered as lower than average past experience and should not be reduced. Thus, the \$490 million for unk-unks should be approved.

² Report at III-A-24.

³ Id. at III-4.

⁴ Id. at III-A-24.

⁵ Id. at III-4.

⁶ WBEC Vol. IV at 9-53

⁷ Id. at 9-53 and 9-61.

⁸ WBEC Vol. IV at 9-53.

⁹ See comments, supra, at 7-8.

events. Also, unknown-unknowns are most likely to occur after we commence construction and, therefore, after the design change mechanism has ceased to operate. In addition, the Report would so narrowly restrict the operation of the design change mechanism that it is very unlikely that the CCE would be adjusted to reflect unknown-unknowns in the event any were discovered prior to final design. After final design, there are only a limited number of events that can qualify under the Change in Scope mechanism. The Design and Scope Change mechanisms are not meant to cover abnormal events. It was the intent of the IROR orders that abnormal events be covered by the Center Point.

b. Assigned Contingency

The Report agrees with WBEC's reclassification of all of the cost impacts of five abnormal events to an "assigned contingency" and partial reclassification of the cost impacts of five other abnormal events to "assigned contingency,"¹ because we assigned these events a 100 percent chance of occurrence. Our classification of these abnormal events was consistent with the intent and purpose of the IROR orders.

Contrary to the Report's erroneous assertion,² the Center Point basket was not considered a catch-all basket by the sponsors. As explained in the Technical Conferences, the list of Center Point events was made prior to development of the base estimate or contingency. Abnormal events were listed first in order to be sure their impacts would not be included in the establishment of the base estimate or contingency. However, probabilities and cost impacts could not be assessed for the Center Point events until after the base estimate had been set. While some abnormal events were assigned a 100 percent likelihood of occurrence, they do not fit our established criteria for normal contingency or the intent of the IROR orders that the CCE, which includes a contingency for normal estimating uncertainty, not contain an allowance for abnormal events. Allowances for the abnormal events identified in our analysis would not normally be included in a contractor's or vendor's contingency. These events would be covered by a force majeure clause, change orders, or some other contractual modification. Furthermore, the fact that an event was assigned a 100 percent likelihood of occurrence does not mean that the event is really normal. The very concept of a Center Point allowance recognizes there is a 100 percent chance that project costs will be impacted by abnormal events. However, the logical conclusion of the Report's position is that the entire Center Point allowance should be shifted to contingency. This is clearly not what the Commission's IROR orders intended. For these reasons, abnormal events with 100 percent probability were properly classified as Center Point events.

The reclassification of these abnormal events to a fifth basket -- "assigned contingency" -- creates confusion and interjects cost impacts of abnormal events into the CCE. Therefore, these events should remain in the Center Point and not be transferred to assigned contingency.

¹ Report at III-19.

² Id. at III-19 n. 46.

c. Center Point Event Nos. 19 Through 23 are not Allowances for Unanticipated Inflation

The Report claims that the cost impacts of Center Point Event Nos. 19 through 23 are really allowances for unanticipated inflation and should be eliminated from the Center Point, because the IROR inflation adjustment mechanism is intended to remove the effects of inflation from the calculation of the Cost Performance Ratio and because the IROR risk premium is intended to protect Alaskan Northwest against inaccuracies in the application of that mechanism.¹

Center Point Event Nos. 19 through 23 are not designed to cover unanticipated increases in inflation. These events cover the risks of cost increases due to unexpected competition for construction materials,² transportation services,³ construction equipment,⁴ qualified contractors,⁵ and craft labor and foremen.⁶

It is also important to note that WBEC and the Report agree that these events reflect real risks of overruns for which we should be protected, and there is no allegation that these costs have already been provided for elsewhere in the CCE or Center Point.

The project faces the very real risk that, at the time it goes to the market to acquire materials, equipment, transportation services, construction services, and labor, it will have to compete for these items with other large construction projects, under construction during the same time frame as the Alaska segment, both worldwide and domestic. Such competition could result in demand far outstripping supply, causing sharp increases in the real costs of these items independent of inflationary increases.

Both the staff and WBEC recognize that these are legitimate Center Point events and would include an allowance for them. Notwithstanding its assertions referenced above that these are not true Center Point events, the Report itself recommends that one-fourth of their cost consequences, as estimated by Alaskan Northwest, be retained in the Center Point, effectively conceding that they are in fact true Center Point events.⁷ The three-quarter reduction, however, is completely arbitrary.

The Report's recommendations on these Center Point events are internally inconsistent and conflict with both the staff and its own consultant and should be rejected. Our value for these events, \$321 million, has been fully justified in our CCE filing and April 13, 1981 comments on the Draft Report and should be retained in the Center Point.

¹ Report at III-20.

² Event No. 19, See, generally, CCE Vol. V at 4-20 to -24.

³ Event No. 20.

⁴ Event No. 21.

⁵ Event No. 22.

⁶ Event No. 23.

⁷ Report at III-20 n. 51.

E. The Liberal Design Change Process Should be Reaffirmed

The July 1, 1980 CCE filing submitted for approval by the Commission was based upon an approximately 5 to 10 percent design. The Report finds that this is an adequate design basis for approving most of the filed CCE at this time.¹ Since the July 1 submittal, Alaskan Northwest has continued to detail this design as we move toward the final design, which must be submitted to OFI for approval prior to the start of construction. It was the manifest intent of the President's Decision and the Commission's IROR orders that the most complete design and cost estimate possible be finalized prior to commencement of construction. Every effort was to be employed by the sponsors in consort with OFI to determine the projected cost of the project prior to construction commencing. The requirements of a final design prior to construction was the outgrowth of the cost overruns on the TAPS oil line, which were partially attributable to lack of a complete design prior to construction.

In order to foster the refinement in design that would take place between approval of the CCE and the final design, the Commission, in Order 31, provided for a liberal design change policy prior to final design, stating as follows:

The Commission's approach has been to structure the IROR mechanism to accommodate changes in cost estimates attributable to increasing knowledge of design requirements, through adoption of a liberal design change policy prior to the commencement of construction. However, the Commission insists that realistic cost estimates be provided to the government prior to the commencement of construction. This result is achieved by severely constraining the circumstances in which scope changes will be considered once construction has commenced.²

The purpose of the liberal design change policy is twofold. First, the design is to be as complete as possible before construction commences in order to lessen the chance of cost overruns. Second, the sponsors are provided an incentive to incorporate cost saving design changes which benefit the consumer by reducing the total costs of the project. In this regard, the Commission further stated in Order 31 as follows:

Changes that occur prior to approval of the Final Design are governed by Condition No. 9. Such changes, for instance, could include design changes generated by new technology or further study by the project sponsors.

Condition No. 9 provides a strong incentive, and wide latitude, for the project sponsors to consider seriously and study intensively all of the problems and risks that they will confront, and to evaluate, propose and justify any design

¹ Report at 17.

² Order 31 at 17 (emphasis added).

changes that they deem necessary and appropriate, including all of the cost consequences of such proposed changes. If properly justified as desirable changes in design that cause real changes in cost, those cost changes will then be reflected in revisions to the Certification Cost Estimate and the Projected Capital Costs (but not in the Center Point).¹

In Order 31-B, the Commission clarified that design changes resulting in reduced capital costs would not require a reduction in the CCE.² The only limitation on the design change mechanism is that the CCE will be reduced where it can be shown that the sponsors put a more costly design in the CCE in order to improve their expected Cost Performance Ratio and, thus, their return.³ However, the Commission did not repudiate its intention that, absent evidence of such abuse, the sponsors benefit from cost saving design changes.⁴

Although the Report recognizes that the President's Decision provides for two distinct cost estimate approvals at two different stages of design⁵ and pays lip service to the liberal design change policy,⁶ the entire thrust of the Report is to restrict severely upward adjustments in the CCE for design changes and to prevent the sponsors from benefiting from cost saving design changes. The cumulative effect of the Report's recommendations and guidelines is to read Condition 9 out of Order 31 and for all practical purposes make the approved CCE the Final Cost Estimate, contrary to the intent of the President's Decision and the IROR orders.

In addition to showing a general disregard for Condition 9, the Report's recommendations are deficient in three particular respects.

1. The Federal Inspector Does not Have Absolute Discretion to Make Adjustments in CCE for Design Changes

The Report interprets Condition 9 to confer absolute discretion on the Federal Inspector to determine whether the CCE should be adjusted upwards or downwards to reflect the cost consequences of approved design changes, including the discretion to offset increases in the CCE with decreases resulting from other design changes or amounts contained elsewhere in the approved CCE.⁷ Condition 9 does not authorize the Federal Inspector to offset reductions in the CCE resulting from cost saving design changes against increases in the CCE from design changes with increased costs. The only authority vested in the Federal Inspector to deny the sponsors the benefits of cost saving design changes is

¹ Order 31 at 122.

² Order 31-B at 41-42.

³ April 28 Order at 100-101 n. 121.

⁴ Id.

⁵ Report at I-3.

⁶ Id. at III-7 n. 19

⁷ See, e.g., Report at IV-14, -18, -20, and Attachment E at 6-7.

where some abuse has been shown. Otherwise, Order 31 is quite explicit that the CCE must be adjusted to reflect the cost increases of approved design changes.

It would also not be appropriate to consider the base estimate, contingency, or Center Point when determining whether to adjust the CCE for design changes, because, as we have previously stated, the CCE and Center Point exclude any allowance for design or scope changes.¹ Moreover, offsetting design changes with amounts in the Center Point or assigned contingency would be doubly erroneous because they compensate for the risks of cost impacts occurring after final design and after construction has commenced. Conversely, the design change process is designed to cover the cost impacts of changes occurring between approval of the CCE and final design.

Thus, the Federal Inspector's discretion is not absolute. While he has discretion to determine whether proposed changes are "...changes in quantities or types of materials, labor, and services, and changes in project development or construction schedule and construction techniques, resulting from changes in design or schedule...", approve or disapprove the inclusion of the cost consequences of such changes in the CCE, and determine whether the CCE should be reduced to reflect the cost impacts of a cost saving design because of an abuse by the sponsors, he does not have discretion to net cost increases and decreases.²

2. The Report's Recommendations on Particular Design Changes Are Inconsistent with a Liberal Design Change Policy

The Report's particular recommendations on whether a change would qualify as a design change under Condition 9 are inconsistent with Order 31's liberal design change policy. The Report states that a change from refurbishing Alyeska's construction camps to building new camps would not be a design change, because "...the basic component -- camps -- would not have changed and any differences between the estimate and actual camp costs should be considered, in essence, price changes."³ This argument would wipe out entirely the design change mechanism.

While the Report argues that in order for a change to qualify as a design change under Condition 9, the change must be a change in a basic component of the pipeline. The Report has already recognized that the basic components of the pipeline project should not change.⁴ Thus, the requirement that a change be a change in a basic component before it could qualify as a design change would make it virtually impossible to qualify, contrary to the intent of Condition 9. Nothing in Condition 9 supports the Report's limitation of the design change process to changes in basic components.

¹ Id. at IV-12.

² Order 31-B at 72.

³ Report, Attachment F at 7.

⁴ See Report at I-7, I-18.

Furthermore, a change from existing camps to new camps is obviously a change in design, techniques, and quantities and not merely a change in price. Different quantities of different materials are necessary to construct new camps instead of renovating existing camps.

The Report's recommendation on camps is also internally inconsistent with other recommendations it makes. For example, the Report states that additional testing of refrigeration, if required by the Federal Inspector, would be a design change.¹ However, the basic component -- refrigeration testing -- will not have changed; rather, the amount of such testing will have been increased. The Report also states that a change in design from using the Yukon River bridge to building a new bridge to cross the Yukon River, should we be unable to obtain the necessary approval of the State of Alaska and the TAPS owners to use the existing bridge, would not qualify as a design change "...if the choice between alternatives is made solely on the basis of price."² Ironically, this is the one potential change referenced by the Report that could qualify as a design change under the Report's "basic component" argument, because the original basic component -- Yukon River bridge -- would not be utilized.

3. The Report's Recommendations Usurp the Authority of OFI

As demonstrated above the Report's recommendations on design changes are often inconsistent with the Commission's IROR orders and self-contradictory. The Commission should disavow the particular recommendations of the Report on whether a particular change would or would not qualify as a design change for which an adjustment to the CCE should be made. Such recommendations invade the province of the Federal Inspector and are inconsistent with the Report's own observations that design changes should be determined on a case-by-case basis after consideration of all the circumstances.³ The resolution of whether something is a design change should await a concrete presentation by the sponsors. If guidelines are to be developed, they should be developed by the Federal Inspector, not the Commission.⁴

4. The Commission Must Reaffirm a Liberal Design Change Policy

Most importantly, the Commission must reaffirm the liberal design change policy established by Order 31. This policy was relied upon by Alaskan Northwest in preparing the CCE and Center Point. If the Commission is now going to abandon this policy in favor of a restrictive policy as recommended in the Report, Alaskan Northwest will have to consider recommending appropriate adjustments in contingency and the center rate of return to cover the increased risks to the project from the cost impacts of design changes prior to final design.

¹ Id. at IV-19.

² Id. at IV-12.

³ Id., Attachment E at 3.

⁴ See also Condition 9, which requires the Federal Inspector to adopt guidelines. Order 31-B at 73.

F. Other IROR Issues

1. Labor Cost Adjustment Index

Because the Commission believed the sponsors should not be penalized for cost increases resulting from general inflation, the Commission provided in Order 31 that the actual capital costs for the project should be adjusted to eliminate the effect of general inflation prior to calculating the Cost Performance Ratio and the IROR.¹ For this purpose, the Commission provided for an inflation adjustment mechanism to deflate actual construction costs (excluding interest during construction) to base year prices for comparison with the CCE, which is also in base year prices. In essence, the inflation adjustment mechanism is a composite of indices for categories of costs of building the project, such as labor, line pipe, etc.

In Order 31-B, the Commission invited the sponsors to propose specifications for the labor component of the composite index.² Pursuant to this invitation, Alaskan Northwest proposed in its July 1, 1980 CCE filing that the labor component of the composite index be the index or indices defined in the Project Labor Agreement(s) negotiated for the project.³ The basis for this proposal was two-fold. First, if the labor inflation index is established prior to negotiation and execution of the PLAs, it is no longer available to Alaskan Northwest as a bargaining chip in negotiating the PLAs. Any lessening of flexibility in negotiating the most overall favorable PLAs could likely result in higher labor costs. Second, a national labor index will not reflect the historically higher inflationary increases prevalent in Alaska labor rates.

The Report recommends rejection of Alaskan Northwest's proposal.⁴ Instead, the Report recommends use of the National Pipeline Agreements and Richardson Construction Cost Trend Reporter, which were approved for the Eastern Leg pre-build, unless Alaskan Northwest develops a better, broadly based index in the course of its comments on the Report. The Report's proposed rejection of Alaskan Northwest's proposal appears to rest on the following position:

Thus, acceptance of Alaskan Northwest's proposal would be inconsistent with the Commission's express desire to use "published, objective price and cost data that are not substantially affected by the actions of project sponsors."⁵

The fallacy in the Report's reasoning is that significant differences in inflation already exist between Alaska and lower 48 wage rates. This difference will be inherited by Alaskan Northwest, not created by it. A national index which is not adjusted to reflect this historical difference will fail to protect the sponsors from the effects of inflation.

¹ Order 31 at 111.

² Order 31-B at 30.

³ CCE Vol. I at 13-14.

⁴ Report at V-4.

⁵ Id. at V-3.

It is no answer, as suggested by the Report, that the IROR Risk Premium will compensate the sponsors for such inaccuracy.¹ While the IROR Risk Premium is partially designed to compensate Alaskan Northwest for the risk that the inflation adjustment mechanism will not exactly track inflation experienced by the project, this is no excuse for adopting an index known to be flawed from the outset, particularly when labor costs will be such an important component of project costs. Furthermore, the IROR Risk Premium is to compensate for risks associated with the entire IROR mechanism, not just the vagaries of one element (labor) of one component (inflation adjustment) of that mechanism. The failure of a national labor index, as proposed by the Report, to track the historically higher Alaska labor inflation could, however, use up most of the Risk Premium so that risks from failure of the other 24 major components of the inflation adjustment mechanism to reflect actual inflation and risks from the operation of the IROR mechanism generally would not adequately be covered.

If the Commission should decide to utilize a national labor index for the labor component of the composite inflation index, Alaskan Northwest proposes that the labor inflation index be based on the Means skilled average labor rates as adjusted by the Means weighted average labor index for Anchorage. Means' skilled average rate is based on the average labor rates in the 30 largest cities and 35 construction trades. The proposed labor index is based on an objective, broad based source, Means, and an objective adjustment, also from Means, that reflects the historical difference in inflation in labor rates between Alaska and the lower 48.²

Finally, the Report states that:

In fulfilling his IROR enforcement duties under the Northern Border certificate, the Federal Inspector had to substitute certain indices for similar indices no longer published. We recommend incorporation of the substituted indices chosen by the Federal Inspector in Alaskan Northwest's certificate.³

The Commission should not automatically and unilaterally incorporate into Alaskan Northwest's certificate indices substituted by the Federal Inspector for similar indices contained in Northern Border's certificate that are no longer published. Instead, Alaskan Northwest recommends that the Federal Inspector, based upon the facts and circumstances peculiar to Alaskan Northwest and after consultation with Alaskan Northwest, determine the appropriate substitutes for indices no longer published.

¹ Report at V-3.

² In this regard we would note that the 1981 Means city index for labor in Anchorage is 145.0 while such indices for the lower 48 cities with the traditionally highest labor rates are 127.6 for San Francisco and 111.8 for New York City. See Means (1981 ed.) at 290 and 295.

³ Report at V-4 n. 11.

2. The Sponsors Should Not Be Held Accountable for Third Party Monitoring, Socioeconomic and Other Government Related Costs

In preparing the CCE, Alaskan Northwest requested and received an estimate of reimbursable costs that would be incurred by various federal and state agencies.¹ We did not make an independent evaluation of the validity of these estimates. For purposes of submitting a complete filing, they were included in the CCE. However, we proposed in our July 1 filing that the CCE be adjusted to equal the actual capital costs for third party monitoring and other government-related costs for the determination of the Cost Performance Ratio.² Alaskan Northwest proposed use of actual costs for government-related costs because Alaskan Northwest has no control over the preparation of the estimate for or the incurrence of such costs.

Although the Report concedes that "...the Federal and State governments completely control their own estimates,"³ it nonetheless insists that Alaskan Northwest estimate government related costs and include such estimates in the CCE.⁴ The use of estimated costs which Alaskan Northwest has 1) no hand in preparing; 2) no way to verify; and, 3) no way to control effectively clearly penalizes Alaskan Northwest and is directly contrary to the purpose of the IROR mechanism.

The single purpose of the IROR mechanism is to provide an incentive to the sponsors to control costs during construction.⁵ This purpose, however, can have no meaning where Alaskan Northwest is without control over the preparation of the estimate or the incurrence of costs.⁶ The Report's recommendation that Alaskan Northwest be required to estimate government costs cannot be reconciled with its own admission that Alaskan Northwest has no control over the governmental agencies' estimates. The Report attempts to dodge this problem by stating that Alaskan Northwest should resolve disagreements over such estimates through negotiation with the agencies or "appropriately justified" adjustments to the estimates.⁷ The Report, however, does not discuss how Alaskan Northwest might justify changes to an estimate submitted by an agency. How can Alaskan Northwest say how many manhours of work the governmental agencies should be expected to take in overseeing construction of the pipeline or how many trips various agency personnel should or will make to Alaska and other company office locations. If an agency's estimate provides for 75 trips per year,

¹ Estimates were submitted by the Office of the Federal Inspector, Department of Interior, and the State of Alaska.

² CCE Vol. I at 14.

³ Report at V-5.

⁴ Id. at V-8.

⁵ See, e.g., Order 31 at 21-23.

⁶ Alaskan Northwest would note that the IROR mechanism provides that the sponsors should not be penalized in those instances where they have no control over costs, such as inflation and change in scope events.

⁷ Report at V-5.

how can the project sponsors be expected to determine whether 75 per year is too many, not enough, or just right, and how can Alaskan Northwest "justify" a change? Although there are historical bases for estimating the costs of labor and materials for constructing a pipeline, there are none for governmental monitoring. For example, Alaskan Northwest utilized standard sources for estimating labor productivities for construction work in Alaska in putting together the CCE. Alaskan Northwest has a good idea of how many manhours it can be expected to take to construct a compressor station or lay pipe. Alaskan Northwest does not have any similar bases for estimating the costs of governmental monitoring. Alaskan Northwest cannot check or verify the validity of the labor productivity assumptions that went into the agency estimates. Records of the labor productivity of government agencies in monitoring construction projects, if available at all, are not available to the sponsors. Furthermore, Alaskan Northwest cannot check the validity of monitoring cost estimates by resort to requests for bids or quotes as in the case of other areas of the CCE, because there is obviously only one "vendor" for required government approvals or services. Thus, Alaskan Northwest is not in a position to justify the estimates submitted by the agencies, let alone adjustments to those estimates. Moreover, for the sponsors to estimate the cost of government monitoring of their own project raises troublesome conflict of interest problems.

The Report recommends that the OFI estimate be approved because it "has not been questioned or challenged by Alaskan Northwest or any other party...."¹ Who would question it? The FERC staff? WBEC? On what basis?

Alaskan Northwest similarly has no control over the incurrence of costs by governmental agencies once construction commences. With non-governmental items we have leverage to try and force a contractor or vendor to meet schedules and stay within budget. For example, we can go out for competitive bids. We can station quality assurance personnel in a vendor's shop or at an execution contractor's work site. We write the specifications for material and equipment. The bottom line is that if a vendor or contractor fails to control costs, we can replace him.

But, other than moral suasion and litigation, Alaskan Northwest has no such leverage to control government costs. We cannot have our quality assurance personnel and auditors monitor the government monitors to make sure they are within budget. We cannot go out for competitive bids for governmental agencies or threaten to replace a governmental agency that overruns its estimate. The sponsors could theoretically withhold funds when overruns occur; however, history has made clear that an agency can halt required services and/or withhold necessary approvals thereby creating delay and increasing the costs of the project.² Finally, although government-related costs may significantly impact the project, such costs are reimbursed on a cost-incurred rather than a fixed price basis.

¹ Report at V-8.

² Alaskan Northwest would note that when it objected to the Commission's filing fees, the Secretary suspended processing of its application. Alaskan Northwest would also note that the DOI Right-of-Way Grant and certain OFI regulations provides for issuance of stop work orders.

The Report's recommended cost control technique is that we sue the particular agency if we believe monitoring costs are unreasonable.¹ We find this recommendation at odds with the Report's rationale for opposing the use of actual costs: "[a]cceptance of the Alaskan Northwest staff proposal would...put parties who should be striving to cooperate with each other in an adversarial position at a critical time in project construction."² In fact, the Alaskan Northwest proposal does just the opposite by eliminating the conflicts. Furthermore, the fact that certain governmental costs are reimbursable as a matter of law does not mean that they are reasonable from a cost control standpoint.

Alaskan Northwest faces substantial risks from increases in government-related costs. Holding us responsible for actual governmental costs in excess of the estimated costs, when we have no control over them, unfairly penalizes us by increasing the Cost Performance Ratio and lowering our return. The reasonable resolution of this issue is to adopt our proposal. Alternatively, government-related costs could be excluded altogether from the CCE and Actual Costs and not be considered in determining the Cost Performance Ratio.

Because Alaskan Northwest proposed utilization of actual government-related costs for purposes of calculating the Cost Performance Ratio, Alaskan Northwest did not include a normal contingency on such costs. Nor did Alaskan Northwest include in its Center Point allowances for governmental failure to perform. If the Commission decides that government-related costs must be treated on a basis other than that proposed in our agreement with Staff, Alaskan Northwest will have to attempt to evaluate the estimates submitted by the government agencies and consider increasing the contingency and Center Point accordingly.³

Alaskan Northwest will be submitting a revised estimate for third party monitoring and government-related costs. Such costs will again be based on the revised estimates provided to Alaskan Northwest by the various governmental agencies which will charge this project based upon the agencies' estimation of the useful service they will render to the project.

As shown above, there is no basis whatsoever to support the Report's recommendation. Whatever estimate for government-related costs is ultimately approved, the project should not be penalized for changes to such estimate beyond its control. Instead, the Commission should state that actual costs are to be used in calculating the Cost Performance Ratio or that government-related costs are to be excluded altogether from such calculation.

3. State of Alaska Highway Costs

The Report states that "[s]hould Alaskan Northwest desire to include the costs of repairing highway damage in the CCE, they should file an estimate of

¹ Report at V-8 n. 30.

² Report at V-8.

³ In this regard, Alaskan Northwest would note the Report's position that most increases in government-related costs could not qualify as a design change. See Report at V-9.

such costs for Commission Review in the above-mentioned proceeding."¹ Alaskan Northwest will submit an appropriate estimate of any such costs for Commission review and approval as part of the additional data and information necessary for the Commission to issue a final certificate.

Even though Alaskan Northwest will submit a filing addressing any possible State of Alaska highway costs, Alaskan Northwest believes it is necessary to address at this time the following two points raised in the Report:

Whatever the result of such a proceeding, two points are important to mention here. First, the Commission could, for all practical purposes, be determining the prudence of costs in addition to the propriety of their inclusion in the CCE (footnote omitted). Second, as is the case with all "non-design" costs, once a CCE amount for these costs, if any, is determined, there should not be any CCE alterations available to the sponsor prior to the approval of Final Design unless the alteration is caused by a schedule change or unanticipated requirements in a major government authorization issued subsequent to CCE approval.²

As to the first point, the Report implies that there is a question as to whether it is prudent to include this type of cost in rate base. If the Commission believes it necessary to make a policy determination on this matter, such determination should be made expeditiously to provide the sponsors with some guidance on the matter.

As to the second point, the Report proposes pre-determination of action which may or may not occur subsequent to the Commission approval of the CCE. As previously discussed the Report tampers with the jurisdiction of OFI. More fundamentally, acceptance of the Report would preclude adjustments to the CCE for changes in an estimate of costs that could be affected by the stipulations in the State Right-of-Way lease yet to be received. Those stipulations will have been agreed to subsequent to CCE approval, but prior to submission of the final design cost estimate to OFI. If this is the true position of the Report, it is arbitrary and unreasonable.

4. Affirmative Action Training Programs

In the July 1, 1980 filing, Alaskan Northwest included in the CCE certain costs associated with administering an Affirmative Action Plan. At that time two important government actions remained to be taken as follows: 1) approval of Alaskan Northwest's AAP by the OFI, which occurred August 13, 1981, and 2) issuance of a right-of-way across Federal lands to Alaska, which occurred on December 1, 1980, and which imposed a new requirement for the recruitment,

¹ Report at V-9.

² Id. at V-9.

testing, training, placement, employment, and job counseling of Alaska Natives. Alaskan Northwest will submit as part of the additional data and information necessary for the Commission to issue a final certificate an estimate of the costs of implementing the approved plan and training program required by the DOI Grant. If it becomes necessary to modify programs to comply with changes in interpretation, changes in law, and government directives, the discretion of whether any cost adjustment should be made to the CCE should rest with the Federal Inspector.

G. Deferred Items

The Report recommends deferring the setting of a CCE value for the communications and supervisory systems, the affirmative action training programs, State of Alaska monitoring and socioeconomic costs, and the management plan, because the sponsors' plans for those items had not crystallized sufficiently at the time of the CCE filing to allow preparation of a reliable estimate.

While Alaskan Northwest agrees with deferral of consideration of the communications and supervisory systems and affirmative action training programs, the CCE value for the management plan must be set now as previously explained in these comments.

Further proceedings to consider these deferred issues should be before the Commission and should utilize informal notice and comment proceedings, with the settlement of issues by stipulation encouraged. Alaskan Northwest believes the deferred issues should be resolved by the Commission, because a structure is already in place for approval of CCE related matters.

CONCLUSION

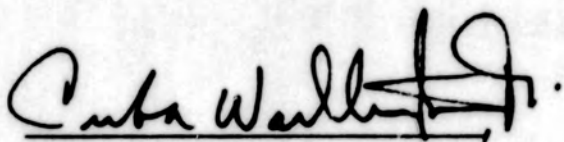
The CCE and Center Point requests are in full accord with the letter and intent of the President's Decision and the Commission's IROR orders. The assumptions and contentions of the Report's authors which form the basis for the Report's various recommendations are demonstrably misleading or in error. The weight of the evidence does not support the subjective conclusions of the audit and the Report's total reliance thereon is arbitrary and capricious. The Report's attempts to ignore the Center Point exhibit and rely instead on extraneous factors must fail for such factors do not support the Report's conclusions. The Report's attempts to deviate from Orders 31 and 31-B are an admission that this exhibit demonstrates the validity of the Center Point request. The Report's recommendations on restricting the design change process should not be countenanced. Lenders and equity investors are reluctant to place significant sums at risk in a project where the government exhibits a tendency to change the ground rules upon which investor decisions have been based.

For the foregoing reasons, Alaskan Northwest requests the Commission to approve a CCE of \$7.93 billion and a Center Point of 1.287, subject to the revisions to the filed CCE resulting from Alaskan Northwest's forthcoming filing on the deferred items referenced herein.

Respectfully submitted,

ALASKAN NORTHWEST NATURAL GAS
TRANSPORTATION COMPANY

By:



Cuba Wadlington, Jr.
Director, Regulatory Affairs
Northwest Alaskan Pipeline Company
1120 20th St., N.W.
Suite S-700
Washington, D.C. 20036

September 18, 1981

APPENDIX A



SOHIO GAS PIPELINE COMPANY

3333 MICHELSON DRIVE, IRVINE, CA 92730

September 15, 1981

Mr. Cuba Wadlington, Jr.
Northwest Alaskan Pipeline Company
c/o Fluor Engineers and Constructors, Inc.
3333 Michelson Drive
Irvine, California 92730

Dear Cuba:

The following information on pipe lay rates are provided to you for your use in commenting on the Alaska Delegate and OFI Director Final Report on the Certification Cost Estimate and Center Point Request.

The current estimated pipe lay rate developed by WBEC for SOHIO's Prudhoe Bay Facilities at Prudhoe Bay, Alaska are as follows:

Pipe Size	WBEC Estimated Lay Rate per day		
	<u>Summer</u> May to Oct.	<u>Fall/Winter</u> Oct. to Jan.	<u>Winter</u> Jan. to May
36"Ø	1560 Ft.	1320 Ft.	936 Ft.
34"Ø	1560 Ft.	1320 Ft.	936 Ft.
28"Ø	2112 Ft.	1760 Ft.	1267 Ft.
24"Ø	2160 Ft.	1760 Ft.	1267 Ft.
20"Ø	2980 Ft.	2376 Ft.	1788 Ft.

The lay rates are based on double-jointed pipe and are part of WBEC's "Pipeline Optimization Plan" prepared for SOHIO Construction Company in September 1981.

Sincerely yours,

Arlie M. Skov
Arlie M. Skov

MKHC
AMS:MKHC:trg

APPENDIX B



SOHIO GAS PIPELINE COMPANY

3333 MICHELSON DRIVE IRVINE CA 92730

September 15, 1981

Mr. Cuba Wadlington, Jr.
Northwest Alaskan Pipeline Company
c/o Fluor Engineers and Constructors, Inc.
3333 Michelson Drive
Irvine, California 92730

Dear Cuba:

Pipeline Lay Rate

With regard to pipeline lay rate assumptions in the Final Report to the Commission by the Alaskan Delegate and the Division Director, Audit and Cost Analysis, Office of the Federal Inspector, SOHIO offers the following comments:

The Williams Brothers Engineering Co. (WBEC) argument on their pipeline productivity or lay rate relies on a time and motion estimate performed by Mr. H. W. Franks, who is recently employed by WBEC. Northwest Alaskan (NWA) pointed out in their response of May, 1981 that while Mr. Franks argued for a lay rate of 3,864 feet per day, he had previously testified to the FPC (as quoted by the Commission in their report of May 1, 1977), (Page VIII-10) that a rate of 1/3 mile per day (1,742 feet per day) was reasonable for a proposed 800 mile, 42" line⁽¹⁾ paralleling the majority of the NWA route.

Mr. Adger was notified during the Fall, 1980 hearings that a reasonable pipeline work rate had been espoused by Mr. Franks when a member of a prior study group that estimated the cost of

(1) 48" pipe would involve a lower productivity in feet per day.

SOHIO GAS PIPELINE COMPANY

Mr. Cuba Wadlington, Jr.
September 15, 1981
Page Two

laying 48" pipe in Alaska⁽²⁾⁽³⁾ and there was a need to show what had changed to justify a new estimate near 4,000 feet per day.

The FERC should reject out of hand the current lay rate opinion by this witness for WBEC and the Alaskan Delegate as he (they) has failed to show why the rate given in previous testimony and studies for near identical pipelines should suddenly be doubled.

In fact, while the cost of the pipeline is greatly affected by lay rate, the cost of that activity and crews controlled by it, are highly dependent on crew sizes. The only true measure of labor costs for laying pipe is the total manhours consumed by each activity per quantity installed, in this case, line-up and weld in manhours per foot of pipe. Comparison of NWA to the only data for laying large diameter pipe, Alyeska's, shows that, in fact, NWA may be overly optimistic in estimating labor costs for laying pipe rather than having overestimated costs as alleged.

Alyeska data on manhours required to line up and weld a foot of pipe embraces the total manhours for the line-up, stringer bead and hot pass crews (repair labor hours resulting from the well-publicized x-ray problem are not included)

NWA estimated manhours for activities 606, 607 and 608 have been combined to compare with TAPS data. The comparison clearly indicates that more manhours will be required than estimated based on the collective memories and judgment of the NWA consultants. The Alyeska "Actual" data was obtained from a 2nd quarter 1977 manhour summary and may not correspond precisely to final Alyeska records.

(2) Letter of November 5, 1980 to Cuba Wadlington, Jr. from V. A. Breitenbach placed in the hearing record.

(3) D. D. Grassman, of WBEC stated that this letter and remarks by Mr. Breitenbach on Mr. Franks' inconsistencies were interpreted by him as an endorsement of Mr. Franks as an estimator. This is an obvious gross misinterpretation.

SOHIO GAS PIPELINE COMPANY

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Page Three

Comparison of Weld Productivity

Alaska 48" Pipe

Line-Up and Weld Manhours Per Foot

<u>Section No.*</u>		<u>Alyeska Actual</u>		<u>NWA</u>
<u>Alyeska</u>	<u>NWA</u>	<u>Above Ground</u>	<u>Below Ground</u>	<u>Estimate</u>
1**	6**	0.69	0.94	0.70
2	5	0.86	0.77	0.66
3	4	0.67	0.59	0.67
4	3	0.75	0.74	0.65
	2			0.51***
5	1	0.90	1.13	0.64
System Average		0.79	0.87	0.64
Above Ground and Below Ground Average		0.82		
Excluding Section 1 and Total Section 5		0.73		

*Not directly comparable on section by section basis
for NWA versus TAPS.

**Alyeska Section 1 and NWA Section 6 completely different.

***Does not include Atigun Pass.

It should be noted that data on Sections 2, 3 and 4 indicate no essential change in line-up and weld labor manhours between above ground and below ground pipe. Sections 1 and 5 do not enter into this comparison because of distortions in below ground activity because of Atigun Pass, Thompson Pass, and Keystone Canyon. The most meaningful overall comparison between TAPS actual and the NWA estimated manhours per foot results by excluding these problem areas in Sections 1 and 5 below ground modes and Section 5 above ground (due to extensive use of 60 ft. joints), resulting in a comparison

SOHIO GAS PIPELINE COMPANY

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Page Four

of 0.7 average manhours per foot for TAPS versus 0.64 manhours per foot in the NWA estimate. This shows that NWA's estimate in this area is 12% too low, rather than requiring correction to a lower labor cost, and forcefully argues against any cost reduction due to lay rate, as recommended by the Alaskan Delegate.

In support of their position, WBEC has argued that NWA should obtain a higher lay rate than Alyeska. Their arguments lack merit as indicated below:

1. WBEC argued that Alyeska built the first major Alaskan pipeline, men and equipment were unprepared for the harsh environment, hence a later pipeline would do better.

For this argument to have validity, Alyeska's second year experience should have demonstrated a higher lay rate. No improvement in lay rate was experienced although Alyeska did improve equipment and methods wherever possible.

2. WBEC states that frequent mode changes between the above and below ground pipe interrupted and slowed the work.

The pipe gang, as the pacing activity, welded pipe above ground whether dealing with elevated or buried pipe modes. The "Lower In" or "Elevate" crews following are non-pacing activities. Usually there was no need to interrupt pipe gang work because of mode change. Experience proved lay rates to be about the same for above ground and below ground pipe. NWA will encounter similar interruptions in changing from regular burial to insulated pipe for frost heave areas.

3. WBEC argues unexpected soil condition changes forced frequent Alyeska slowdowns with EC's waiting on Alyeska decisions before proceeding with the same or a new mode. The same potential for delay will exist for NWA. The problem will be changed in that the ditching process will discover unexpected frost heave susceptibility rather than high ice content permafrost. As with TAPS, delays for NWA will be in obtaining a Notice to Proceed to cover the problem.
4. The Southern section of Alyeska construction (excluding Thompson Pass and Keystone Canyon areas) crossed extremely

SOHIO GAS PIPELINE COMPANY

Mr. Cuba Wadlington, Jr.
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Page Five

rough terrain. WBEC infers that this terrain is so rough that it drastically affected the average Alyeska lay rate. This is not true. While some effect was noted, actual experience showed that lay rates in all Alyeska sections were generally equal and approximated the lay rates assumed in the Arctic study prepared in part by Mr. Franks--about 2,000 feet per day. (See tabular lay rate comparison.)

5. Alyeska lay rates are claimed to be low because work was done under reimbursable contracts. This is a horrible indictment of the industry for which WBEC claims expertise. There is, in fact, no data indicating that improved Alaskan lay rate performance will result from fixed unit rate contracts--or that fixed unit rate contracts can be contained without inclusion of excessive allowances for contingencies.

WBEC states that NWA and Alyeska lay rate cannot be realistically compared. This statement brands the analysis as incorrect as Alyeska experience is the only lay rate experience that has any semblance of comparability.

WBEC "experience and judgment" is quoted as the basis for their lay rate "efficiency assessment"--they attempt to validate this by stating that a footnote in NWA's Response of May, 1981 set forth an efficiency factor essentially identical to theirs; and, therefore, endorsed their own efficiency percentage. This is a gross misuse of NWA's statement. The two "efficiencies" apply to different bases. If "base" standard rate is 38 joints per day and actual is 26, efficiency (NWA) is 69%--if "base" were 68 and actual 48, a 71% efficiency would be calculated as used by WBEC. It is improper to apply an efficiency percentage drawn from one base to a different base. Any efficiency percentage is only valid when used in conjunction with the same standards on which it was derived in the first place.

It should be noted that the Alaskan Delegate in his report to the Commission misspeaks when he says on Page II-10, that WBEC lay rate was not challenged by anyone, except in a minor way by one EC contractor. A major objection was raised by the undersigned in pointing out that both NWA and (more so) WBEC lay rates were too high. These comments have been ignored.

In his final report, the Alaskan Delegate quotes the reported 70-80 joints per day routinely achieved by spreads on the Western

SOHIO GAS PIPELINE COMPANY

Mr. Cuba Wadlington, Jr.
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Page Six

Leg, to support his adopting the WBEC lay rate forecast as superior to NWA's. This is a misuse of the data as terrain, weather, and soil conditions are much more favorable to construction of the Western Leg, so that together with the smaller diameter of that line, that lay rate experience is not indicative of what can be obtained in Alaska.

The Alaskan Delegate argues that NWA will experience higher lay rates as they will find it to their advantage to maintain highest practicable weld speed, trading off savings with lower cost of repairing defective welds. He notes that one spread on the Western Leg has achieved 100 joints per day by this means. While such a procedure is possible in the Western Leg, this would require leaving the ditch in Alaska open an excessive length of time. Melting and ditch cave-ins would occur in permafrost areas. Thus this option is not realistically open to NWA for their work as permafrost areas comprise over 2/3's of their route.

Sincerely yours,

Art M. Skov for V.A. Breitenbach
V. A. Breitenbach

VAB:trg

APPENDIX C

WILLIAMS INTERNATIONAL GROUP, INC.

- U. S. A. MAILING ADDRESS -
C. WILLBROS ENERGY SERVICES COMPANY
2530 EAST 71ST STREET
TULSA, OKLAHOMA 74136

September 14, 1981

LARRY J. BUMP
CHAIRMAN & PRESIDENT

RECEIVED

SEP 17 1981

R. N. HAUSER

Mr. R. N. Hauser
Vice President Construction/Logistics
Northwest Alaska Pipeline Company
3333 Michaelson Drive
Irvine, California 92730

Dear Bob:

During a recent conversation, you asked my opinion of the construction cost estimate submitted by your Company in respect to the Alaska segment of the proposed Alaska Natural Gas Transportation System.

I am generally familiar with the Northwest Alaska cost estimate because a vice-president of our U.S. pipeline construction subsidiary, Mr. C. M. Hoffman, participated in the preparation of the estimate. Mr. Hoffman was previously employed in a management position with Morrison-Knudsen and acted in a high-level supervisory capacity in Alaska during the construction of the Alyeska pipeline project. In addition, we have several employees who were active in the management and execution of the Arctic Constructors' section of the crude oil line as well as a former executive of H. C. Price Co. who was involved in the management of section 3 of Alyeska and is now a vice-president of our U.S. construction subsidiary. Quite naturally the high degree of participation by our personnel in the construction of the crude oil pipeline led to a keen interest in the cost estimate submitted by Northwest Alaska to assure its validity in the light of Arctic construction costs and avoidance of cost overruns, particularly in the purview of the fixed price contracting concept currently anticipated by Northwest Alaska.

Generally, I support the cost estimate submitted by Northwest Alaska and am of the opinion that the major assumptions underlying the estimate are realistic, particularly the rates of progress, productivity and daily operating costs.

One major item in the cost estimate that may be unrealistic and low is the overhead and profit margin allowed the execution contractors. Whether or not the profit margin set out in the estimate is adequate will primarily depend upon the ability of Northwest Alaska to adequately define the scope of the work and the contractors' assessment of the financial risk inherent in such a project due to delays and work stoppages that are beyond the control of the contractor, particularly those caused by third parties. A proper balancing of risk and

Mr. R. N. Hauser
Page Two

September 14, 1981

potential reward is a basic axiom of the pipeline construction industry; therefore, if contractors determine that their risk is great, in my opinion the estimated margin for overhead and profit will be inadequate.

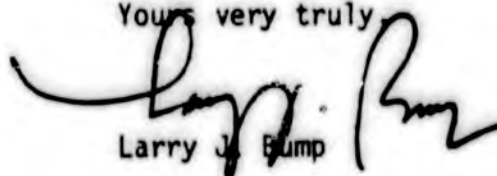
I realize that some controversy exists as to the daily lay rate established by Northwest Alaska and the production rate put forth by consultants employed by the FERC/OFI.

I support the estimated daily pipe lay rates established by Northwest Alaska simply because I believe it to be realistic based upon my own experience and my knowledge that the estimating group utilized by Northwest Alaska included several individuals who were directly involved in the construction of the Alyeska crude oil pipeline system in senior management and supervisory capacities. I know their on-site experience acquired during the building of the crude oil pipeline has been heavily drawn upon by Northwest Alaska. I think everyone concerned will agree that experience in constructing pipelines under Arctic conditions is essential in costing, planning and executing work on a project of the magnitude and complexity of the proposed gas pipeline system. I believe that such equivalent experience would also be useful and necessary to a consultant in any "review and critique task" such as that assigned Williams Brothers Engineering Company ("WBEC") by FERC/OFI.

Perhaps it would be helpful if I explained to you how my Company and WBEC had, at one time, a common parent and pointed out to you the distinction that exists today between the two companies. Williams Brothers has for many years been a prominent name in the pipeline industry, having started as a small contracting company in 1907 and ultimately becoming a large, diversified company known today as The Williams Companies. Neither my company, Williams International Group, Inc. ("WIGI"), or WBEC is today a member of The Williams Companies. WBEC was sold in 1972 and is today a subsidiary of Ashland Oil Company. WIGI was sold in 1975 to a group of management employees and operates in the U.S. and several foreign countries and is privately owned. There is now no relationship whatsoever between WIGI and WBEC. Whereas WIGI continues to be active in pipeline construction, WBEC has traditionally performed technical assignments for its clients, both prior and subsequent to its separation from The Williams Companies. To my knowledge, WBEC is still performing technical assignments and has not worked as an execution contractor on any pipeline project. The WBEC personnel are therefore experienced and competent in design and engineering functions, but not necessarily in actual execution of pipeline construction.

I am hopeful that I have satisfactorily answered the question that you addressed to me. If not, please let me know.

Yours very truly



Larry J. Bump

LJB:wn

APPENDIX D



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
OFFICE OF SPECIAL PROJECTS
701 C Street, Box 30
Anchorage, Alaska 99513

IN REPLY REFER TO
A-0001313

Case C (914)
A103.0202
.0101

SEP. 11 1981

Mr. Harold W. Moles
Vice President, Operations
Northwest Alaskan Pipeline Company
701 Douglas Avenue
Fairbanks, Alaska 99701

Dear Mr. Moles:

In response to your letter of May 28, 1981, and in accordance with agreement reached at the August 21, 1981 ECC meeting, I am forwarding a revised copy of the Enclosure A, Utility Corridor Construction Campsite and Airstrip Decision for your use in FERC filing cost estimates. These decisions state which campsites will be available for future use when existing permit arrangements have been adjudicated.

These decisions are based upon existing information as submitted by Northwest Alaskan Pipeline Company (NWA). I understand that, as suggested at the ECC meeting, further data may become available from your company showing the interrelationships between construction camps which might lead to a better understanding of the need for all camps requested.

Please note that several sites on the enclosures are not approved for future use. This is not to say that campsites will not be approved in the general areas. Rather, the decisions are strictly based upon existing locations and existing applications. Reuse of the camp near Galbraith Lake is opposed by the North Slope Borough. There may be other alternatives such as eliminating this camp and using Toolik, or establishing a construction campsite at compressor station 4. Again, your analysis of options could be useful in arriving at a final decision. At Prospect, the part of the existing campsite that is out of the 100-year floodplain will be considered for reuse although we prefer to see the campsite moved to the airstrip area.

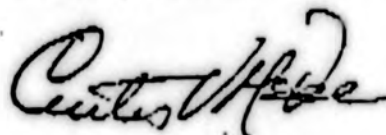
Although the enclosure includes airstrips, we will require individual applications to be submitted for their use.

With respect to the applications of 1978, the State's and BLM's requests for additional information in 1978, and NWA's response to that request in 1981, we fully concur with the analysis the Federal Inspector's office completed of the 1.6.1 Plans (essentially the same as application data). In addition to

the Federal Inspector's findings of inadequacy, it should be made clear that regardless of total area applied for, any further use on existing campsites will be limited to the areas presently disturbed unless clear justification is shown for additional space. In the case of Dietrich Camp, please note that Enclosure B - General Reuse Criteria requires some adjustment in the existing campsite facility locations relative to the Dietrich River.

To assist you in perfecting your applications, I am enclosing a highlighted copy of BLM's Utility Corridor Management Decision Criteria which was just finalized. Incidentally, I am taking this opportunity to convey my appreciation for the comments your office provided during the development of this document. Any permits issued will, of course, have terms and conditions which are consonant with that document and the other attached enclosures.

Sincerely yours,



State Director

Enclosures (3)

APPENDIX E



THE FEDERAL INSPECTOR
ALASKA NATURAL GAS TRANSPORTATION SYSTEM
ROOM 2413 POST OFFICE BUILDING
1200 PENNSYLVANIA AVENUE
WASHINGTON, D.C. 20044

JUN 6 1980

Mr. Darrell S. MacKay
Northwest Alaskan Pipeline Co.
1801 K Street, NW
Suite 901
Washington, DC 20006

Dear Mr. MacKay:

As requested in your letter of June 2, I reviewed the final draft of Northwest Alaskan's Management Plan (dated May 30, 1980). The overall management framework and principles established in the May 30 draft are acceptable and approved. This approval is conditional, however, upon Northwest providing additional details for my review and approval at a later date. I believe this conditional approval is in conformance with our policies of maintaining an interactive relationship with Northwest and providing input in the early stages of all phases of project development.

I recognize that, in some cases, Northwest has not yet fully developed details for the management approach to be used and that, in others, the details will not be ready for release until the FERC Certificate filing date. I also recognize that, as the project evolves, certain revisions to the management approach may become necessary. Such details and changes should be submitted for my review as they are implemented.

Our May 23 letter identifies those areas for which additional details must be provided. Some of these areas are especially critical to project success. Consequently, a detailed description of the duties, responsibilities, and delegations of authority must be provided in the appropriate supplemental documents enumerated in the management plan. The most critical areas are: (1) the responsibilities of the Chairman and Chief Executive Officer, the Vice Chairman and the President; (2) the level of delegation of authority to the NWA field teams; and (3) the relationship between NWA, the Project Management Contractor and the Execution Contractors. While the May 30 draft gives some additional information on items 1 and 3, further details must be provided. Additional details on item 2 are necessary for me to establish a compatible field organization.

Finally, while formal establishment of the specific points of technical staff interface between NWA, PMC, and OFI staff can be worked out at a later date, I believe such a formal identification of the appropriate interface points is essential to a smooth, coordinated working relationship.

Sincerely yours,

Peter L. Look for

John T. Rhett
Federal Inspector

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official restricted service list compiled by the Secretary in Docket No. CP80-435, in accordance with the requirements of Section 1.17 of the Rules of Practice and Procedure.

Dated at Washington, D.C. this 18th day of September, 1981.

Cuba Wadlington, Jr.

Cuba Wadlington, Jr.
Director, Regulatory Affairs
Northwest Alaskan Pipeline Company
1120 20th Street, Suite S-700
Washington, D.C. 20036

**PLEASE NOTE: THE PRECEDING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.**

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Alaskan Northwest Natural)
Gas Transportation Company) Docket No. CP78-123, et al.

MOTION FOR CLARIFICATION OR MODIFICATION
OF ORDER TO SHOW CAUSE

The Public Service Commission of the State of New York (New York), an intervenor in these proceedings, herewith moves that the Commission clarify or modify its Order to Show Cause, issued December 15, 1980, to make clear that interested persons or parties believing that the recommendations of the Office of the Chief Accountant in the audit reports which are the subject of the Show Cause order should be adopted by the Commission will have a reasonable period, not less than 30 days after service of the last of the responses to the Show Cause order, to reply thereto.

The audit reports inter alia recommend that the Commission find that none of the \$38,366,833 expended by four of the partners of the Alaskan Northwest Natural Gas Transportation Corporation (ANNGTC) as their share of the \$154,849,500 expended by Canadian Arctic Gas Study Limited (CAGSL) in support of an unsuccessful certificate application to provide the service for the Alaska Natural Gas Transportation System (ANGTS) had been shown to be of future value to the ANGTS, or otherwise of a nature to qualify for inclusion in the ANGTS rate base. (\$134,089,813 of the total was found to be of "no future value," \$20,759,657 to be of "possible future value or usefulness," not yet demonstrated). With the recent admission into the ANNGTC partnership of four more of the CAGSL members, an additional \$32,082,132 is at stake.^{1/}

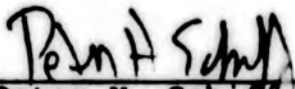
By the December 15, 1980 Show Cause order "interested persons" disagreeing with the data and opinions of the Office of the Chief Accountant were given 60 days to respond. But no

^{1/} See e.g., Opinion No. 101, Columbia Gas Transmission Corp., denying Columbia's request to include CAGSL costs in rate base without prejudice to its seeking recovery of such costs if it or an affiliate become a partner in ANNGTC.

provision was made for answering pleadings by parties like New York concurring in the Office of the Chief Accountant's recommendations. Accordingly, New York requests the Commission to clarify or modify its December 15, 1980 Order to Show Cause to provide a period, to be no less than 30 days after service of the last response to the Show Cause order, for responsive pleadings by all "interested persons" and parties, including the Commission staff, who might wish to support the Chief Accountant's recommendations.

Respectfully submitted,

THE PUBLIC SERVICE COMMISSION OF
THE STATE OF NEW YORK



Peter H. Schiff
General Counsel
Empire State Plaza
Albany, New York 12223



Richard A. Solomon
Wilner & Scheiner
1200 New Hampshire Avenue, N.W.
Suite 300
Washington, D.C. 20036
(202) 861-7800

Its Attorneys

December 23, 1980

CERTIFICATE OF SERVICE

I, Richard A. Solomon, do hereby certify that I have this day served a copy of the foregoing "Motion for Clarification or Modification of Order to Show Cause," by first class mail, postage prepaid, upon all interested parties in this proceeding.



Richard A. Solomon

December 23, 1980

OFFICE OF THE FEDERAL INSPECTOR
ALASKA NATURAL GAS TRANSPORTATION SYSTEM
IRVINE FIELD OFFICE
2222 Martin Drive, Suite #155
Irvine, California 92715

October 2, 1980

MEMORANDUM

TO: John Adger, Alaska Delegate
FROM: Amos Mathews, Director, Alaska Field Office *Eula Quaman for*
SUBJECT: Major Outstanding Design Issues Related to Alaskan Leg

The FERC, in it's August 1, 1980, "Notice of Application and Order Establishing Procedures," requested the OFI to prepare for circulation, at the earliest possible time, a brief report identifying the major outstanding design issues. Attached in response to this request, is a report prepared by our contractor, Unified Industries Inc. Supplemental comments from the OFI staff may be provided during the next conference on Tuesday, October 7, 1980.

The design on which the NWA Certification Cost Estimate and these reports are based was frozen in March 1980. Significant progress is currently being made in the finalization of that design. The intent of these reports is to identify areas containing design options that should be considered as the design is finalized.

These areas are under continuing review by the OFI and the reports do not necessarily represent the final views of the Office. They are intended for purposes of discussion at the conference scheduled to begin on October 7.

SUMMARY REPORT ON MAJOR OUTSTANDING
DESIGN ISSUES

ALASKA NATURAL GAS TRANSPORTATION SYSTEM

09-TR-0006-3

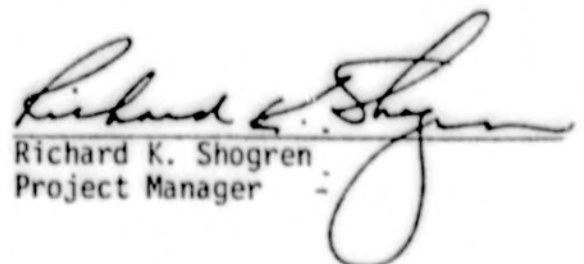
WBS 1.01.22.02

CONTRACT NUMBER

OFI 80-0001

October 1980


for Ashraf M. Mirza
Engineering Manager


Richard K. Shogren
Project Manager

UNIFIED INDUSTRIES, INCORPORATED
2222 Martin Drive
Irvine, California 92715

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1.0 INTRODUCTION

The Northwest Alaskan Pipeline Company's (NWA) certification cost estimate submitted to the Federal Energy Regulatory Commission (FERC) for the construction of the Alaskan segment of the Alaska Natural Gas Transportation System (ANGTS) contains a substantial amount of information regarding the following topics:

- Overall Planning and Design Procedures
- Environmental Engineering Programs
- Current and Projected Field Programs
- Identified Problems and Proposed Solutions
- Assumptions for Design Bases

The Federal Inspector's Office (OFI) has requested its Technical Support Contractor, UII/SDC, to identify and provide a report on outstanding major design issues related to the cost filing. This report is provided in accordance with that request.

These issues have been grouped into the following categories:

- Technical and Environmental Issues (Section 2.0)
- Organizational and Schedule Issues (Section 3.0)

These issues do not include other elements of the cost filing, such as EEO requirements, etc. Upon completion of the ongoing technical review, a more definitive list of outstanding design issues can be developed. Nonetheless, it is our judgement that contained within the issues identified in this report is the potential no matter how slight, for major cost changes, both up and down.

2.0 TECHNICAL AND ENVIRONMENTAL ISSUES

This section identifies those major technical and environmental issues that are considered important to design development for the ANGTS. These issues require resolution early in the development of system designs to minimize large cost changes later in the program.

(1) Design Criteria

Definitive criteria or bases for design of the gas pipeline are required wherever the alignment is adjacent to existing facilities (TAPS, Haul Road, etc.). These criteria must be supplemented with specific construction procedures for installation of the gas line to ensure the integrity and safety of these existing facilities. These criteria are needed also to avoid realignment or a redesign at a later date, and to judge the adequacy of the field data gathering programs.

(2) 1980 Field Program

The 1980 field programs appear to be generally directed toward resolving the major technical issues. However, the adequacy of these programs can not be evaluated because detailed procedures and concepts are not currently available. These programs, which provide the basic data for design confirmations, will not be completed until late 1980 or early 1981.

(3) Frost Heave Design

Frost heave associated with the burial of a chilled gas pipeline in discontinuous permafrost is the most significant design issue affecting

the project. The criteria adopted by NWA to classify the existence and degree of frost heave potential have yet to be validated. These criteria have been applied in estimating the total length of the pipeline which will require special measures to counteract differential frost heave. NWA is not yet ready to demonstrate that select granular material and insulation can control differential heave to the extent necessary to maintain stress concentrations within acceptable limits. At present the magnitude and extent (bounds) of differential heave are difficult to define.

(4) Steady-state Thermohydraulic Simulation

Simulating accurately the thermal behavior of the chilled flowing gas resulting from interaction of gas properties and soil temperatures and conductivities encountered in the Arctic environment is an important requirement of the steady-state thermohydraulic program used for flow calculations. The calculated flowing gas temperatures impact the flow rates, and compressor station equipment design. Further review is necessary to evaluate the cost implications of the thermohydraulic model.

(5) Ditch Design and Stability

Detailed geotechnical data is being acquired but is not yet complete. Therefore, the number of miles required for each ditch design type may conceivably undergo change. Material quantity requirements are affected by changes in ditch design.