1090 TIRES - FERC; NW NATURAL GAS - FERC; ANNGIC

1090

VI. ADDITIONAL CONSIDERATIONS

Our discussions with interested parties suggested that considerations other than design costs and estimated throughput volumes are important to the choice of system operating pressure. This section presents short discussions of the most important of those considerations as we understand them.

1. Vulnerability to Cost Overruns

The project sponsors have expressed the concern that a higher pressure system is more vulnerable to cost overruns. Some support for their concern can be found in the work of Professor Walter Mead of the University of California at Santa Barbara. In a recent study published by the American Enterprise Institute,37/ Professor Mead reported in a chapter on cost overruns (chapter 6) that an econometric analysis of past Defense Department projects "...indicated that cost overruns were significantly related to the length of time required for the development program and the extent of technological advance involved in the project."(p. 86) The implication is that the closer to known technology a project is, or more specifically, the more like a previously constructed project a succeeding one is, the better the cost estimates for the successor project and the less its tendency to cost overruns. To the extent that the 1260-psig system can be considered closer to known technology than either of the higher pressure alternatives, its tendency to cost overrun should be less if an analogy to Professor Mead's analysis of Defense Department projects is appropriate.

Any difference in their respective tendencies toward cost overrun between the 1260-psig system and the higher pressure alternatives would have the effect of raising the crossover point where increased throughput volume makes a higher pressure system result in lower unit transportation charges. Figure 3 in the section which presented the results of our calculations (section IV, supra) shows the effect on the crossover point of an increase in capital costs for a

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37/ Transporting Natural Gas from the Arctic: The Alternative Systems; Walter J. Mead, with George W. Rogers and Rufus Z. Smith; American Enterprise Institute for Public Policy Research, Washington, D.C.; August 1977.

high-pressure system. A similar effect on the crossover point would be realized if cost overruns had the effect of increasing the costs of a higher pressure system relatively more than those of the 1260-psig alternative.

2. Impact on Financing

The Decision requires that the Alaskan Natural Gas Transportation System be privately financed. Therefore, the impact of a decision to utilize a higher pressure system on the ability of the sponsors to obtain private financing is a major concern.

The risk of major cost overruns creates whatever risk there is of project non-completion, and presents the largest single financing problem for the project. Thus, if the lower pressure system is closer to current gas pipeline industry practices, the analysis referred to by Professor Mead would suggest that utilizing the lower pressure alternative reduces the likelihood of major cost overruns and thereby facilitates financing. The effect of technological advances on the reliability of cost estimates was alluded to by the NEB in its February 19, 1978, "Statement of Position."38/

In response to our request for more definitive information on the significance of the pressure question for financing, the project sponsors' principal financial advisers prepared a letter explaining the effect of a decision to utilize a higher pressure system on the financing proposals of the pipeline project. The gist of their concern is that a higher pressure system involves technological risks that lenders and potential equity investors simply will not accept.

3. The Gas Consumers' Interest

The interest of the gas consumer in the low-pressure/high-pressure decision is not obvious. Although a higher pressure system should result in lower transportation charges at higher levels of throughput, it is not assured that such reductions in transportation cost will accrue directly to the benefit of gas consumers.

38/ "Until sufficient field welding tests and production trials are done to establish suitable procedures and the manpower and equipment requirements to achieve progress rates compatible with other crews, the National Energy Board feels the present cost comparisons (between standard-pressure and high-pressure alternatives) based on normal procedures may not be valid." NEB Statement of Position, op. cit., Technical Review, pp. 3-4.

The means by which the delivered price is set for the gas to be transported by ANGTS does not lead to a clear-cut showing of consumer benefit. For the initial throughput volume, an expected 2.0 bcfd from the Main Pool Reservoir of the Prudhoe Bay Field, the delivered price will be the sum of the transportation charge and a wellhead price, plus an allowance for gathering and conditioning if allowed by the Commission. In this case, reduced transportation charges should be passed on to gas consumers as reductions in delivered prices.

In the next few years, however, high-priced sources of gas such as the Prudhoe Bay gas could rapidly exhaust the implicit subsidies provided by allowing the price of this gas to be averaged in with lower cost gas from conventional supply sources. As soon as the use of "rolled-in" pricing has raised the average price of all gas to approximate parity with the delivered price of alternate fuels, incremental gas sales are likely to be made only at prices set by competition with those of alternative fuels. At that point reductions in transportation charges would likely accrue to producers.39/

Depending on the relationship of the netback to the field price from the market value of this gas on the one hand, and the maximum lawful ceiling price set by the NGPA on the other, possible Commission use of rolled-in pricing for other gas supply projects, and changes in the delivered prices of competing fuels, prices for North Slope gas sales after the initial 2.0 bcfd from the Main Pool Reservoir could be set by a netback from the delivered prices of competing fuels. In that event, reduced transportation charges for these incremental volumes would benefit the gas producers.

An efficient natural gas transportation system which encourages the development of additional supply through higher field prices is not without some consumer benefit. The point here is that an analysis of that benefit is not as simple as might be implied by a comparative evaluation of transportation cost curves.

39/ A limitation on such a potential benefit to producers will be the ceiling price on natural gas produced from Prudhoe Bay Unit established by § 109 of the Natural Gas Policy Act of 1978 (NGPA). The price of competing fuels may only determine the price of gas from the Prudhoe Bay Unit to the extent such a price is equal to or less than the ceiling price.

Increased investment in gas conditioning plant:	$30 million
Field fuel system investment:	$50 million
Injection investment:	$25 million
Total:	$105 million

As the likely outcome of a decision to use the 1260-psig system would be a combinatior of cooling the oil pipeline, use of the extra butane in the field, and reinjection, we believe approximately $100 million (in 1978 dollars), including the $30 million required for additional investment in the processing and conditioning facility, is a representative requirement for comparison with the $237 million (in 1975 dollars) additional investment required to increase the system operating pressure to 1680 psig. None of these figures consider operating costs, so any comparisons are necessarily incomplete.

The gas consumer would see the increased investment requirement in the form of increased transportation charges for gas delivered by a higher pressure system, at least for the first 2.0 bcfd of throughput. Although the increase in unit transportation charges would be tempered by the delivery of higher Btu gas, the additional Btu's per unit volume would not be enough to offset the higher transportation charges until throughput volumes get higher than just those from the Main Pool Reservoir of the Prudhoe Bay Field. 41/

On the other hand, the oil consumer would not likely be directly affected by a requirement for additional investment in oil pipeline facilities. North Slope oil prices are effectively set through competition with imported oil, and can not be increased to consumers in order to recover additional transportation costs. Additional investment in the Trans-Alaska Pipeline System (TAPS) simply reduces the netback to the oil producers at the field. The consumer price impact of using the oil pipeline to carry the butane would only be felt as an increase in any processing and conditioning allowance which might have been allowed by the Commission to cover the $30 million extra investment required for the processing and conditioning plant.

41/ Future gas volumes made available for shipment could have less NGL's content than the Prudhoe Bay accumulation, in which case the "drier" composite gas stream would have more capacity for Prudhoe Bay NGL's without increasing system operating pressure.

The investment requirement not touched on in the preceding discussion is that which might be required for vapor recovery systems on storage tanks in areas where the higher vapor pressure caused by adding butane to the North Slope crude would cause unacceptable air pollution problems. Such ancillary investment requirements highlight the importance of the gas pipeline system design question for the North Slope gas producers, as well as for the gas pipeline project sponsors, and the degree of interest the producers should have in optimizing the design of all facilities involved in producing and transporting Prudhoe Bay hydrocarbon resources.

VII. REQUIREMENTS FOR RESOLUTION

I believe that the Decision creates a predisposition that the 1260-psig system is the one authorized by the President and the Congress by its reference to "the facilities...included in the revised Alcan filing submitted to the Federal Power Commission (FPC) on March 8, 1977."42/ Additional NGL's carrying capability of a higher pressure system might be a desirable feature, all other things being equal. However, a technical report filed with the State of Alaska by the major interest owners in the Prudhoe Bay Field (Arco, BP, Exxon and Sohio) in support of their proposed reservoir management plan states:

> Gas pipeline specifications are not currently known and final specifications may increase or decrease the volume of liquids which must be extracted from the gas to prevent condensation in the pipeline. Regardless of the final gas conditioning requirements, all liquids extracted will be used without waste, either to displace fuel gas or to be transported through the oil pipeline.43/

I believe that the language in the Report accompanying the Decision suggesting that:

> ...Alcan should consider increasing the operating pressure and wall thickness of its 48-inch diameter pipeline in order to allow for more efficient increases in throughput rate for additional reserves which might be committed to the system from either Alaska or Canadian sources...."44/

would make the predisposition a rebuttable one on appropriate showings in a final authorization proceeding for these facilities. The discussion below highlights the principal factors which should be evaluated in such proceeding, should one be required to fix this parameter. I believe that favorable findings in all three areas would be required to support a decision to increase the operating pressure of the Alaskan segment.

42/ Decision, op. cit., p. 13.

43/ Exhibit ALA-33 filed in proceedings before FPC, p. 16. Cited in Comments on the "Decision and Report to Congress on the Alaska Natural Gas Transportation System", Federal Energy Regulatory Commission, October, 1977.

44/ Decision, op. cit., p. 193.

1. Concurrence of the Canadian Government

The Government of Canada, across whose territory some length of any of the 48-inch alternatives would have to pass,45/ has previously expressed severe reservations about the 1680-psig alternative on safety and reliability grounds. The Canadian project sponsors share those reservations. The U.S. project sponsors, while concerned about safety and reliability problems (particularly those associated with proximity to the Alyeska oil pipeline), are primarily concerned that uncertainties associated with the 1680-psig system would create significantly higher risks of construction delay and cost overrun than the 1260-psig alternative.

45/ On February 17, 1978, the Canadian National Energy Board chose a large-diameter (56-inch) alternative for the segment of the system through which both Canadian and U.S. gas volumes will flow, to be installed between Whitehorse, in the Yukon Territory, and the bifurcation point near James River in Alberta. Although the operating pressure of the 56-inch system will be 1080 psig, its NGL's carrying capacity is not less than that of a 1680-psig system installed farther north. The reason is the difference in operating temperature: the 56-inch system will operate at a minimum of 40°F, while the northern portions of the system will have to be chilled to below the freezing point of water (32°F) to avoid thaw settlement problems in permafrost soils.

Permafrost soils, and consequently the need for operating the pipeline at or below 32°F, extend less than 100 miles into Canada. The operating temperature can be increased south of that point, allowing the operating pressure to be gradually lowered without losing significant NGL's carrying capacity. The 1080-psig system is, however, incompatible with the very high pressure (2150 psig) system advocated at one point by Exxon.

Thus, Canada would have to approve the use of a higher pressure system for a short distance from the Alaska/Yukon border if such a system is to be used in Alaska.

The hearing record on the safety and reliability aspects of the 1680-psig system was more extensively developed in Canada than in the U.S. proceedings before the FPC. Accordingly, although U.S. technical representatives continue to believe that the 1680-psig system can be constructed and operated safely and reliably,46/ Canadian authorities still have reservations about the high-pressure alternative based on the evidence presented to them.47/

The U.S. project sponsors have also expressed concern about additional hazards of a higher pressure system because of proximity to the TAPS. The additional potential energy in a higher pressure system is thought to represent more of a threat to the structural integrity of the oil pipeline in the event of a gas pipeline rupture. On the other hand, technical representatives of Exxon, one of the principal owners of TAPS, did not feel there was any significant difference in hazard to the oil pipeline between the 1260-psig and 1680-psig alternatives.

A testing program involving the project sponsors, the owners of the oil pipeline and the Canadian Government would seem to be required prior to any decision to increase the operating pressure of the gas pipeline. Exxon representatives in particular have suggested that the required testing program would not be extensive, but we doubt they have tried to convince the Canadian Government or the Canadian project sponsors, both of whom would have to be satisfied with the testing program and its results before a decision to utilize a higher pressure system could be made.

2. Satisfactory Distribution of Costs and Benefits

In the preceding section, I discussed my concern that consumers might not be the primary beneficiaries of a decision to utilize a higher pressure system for the Alaska segment. Here I suggest briefly what types of analysis would be required to support a conclusion that consumers would benefit from higher pressure.

46/ "U.S. Government Safety and Reliability Evaluation o Different Pipe Size and Pressure Combinations for Alask Gas Pipeline", Op. Cit.

47/ Their "Statement of Position" has previously been referenced. See page 4.

The first consideration is expectations about throughput volumes which would suggest that lower transportation costs are likely with higher pressure. A positive finding in this area would have to involve not only conclusions about ultimate throughput, but also the timing of throughput increases, as a decision to ask consumers to pay more now in order to pay less later would have to pass a present value test.

The North Slope producers either now have or will have the geophysical and drilling information which might support increased capacity in the delivery system. Much of this information may have been supplied by them to the State of Alaska and the USGS, but under confidentiality arrangements which effectively deny access to any parties not specifically granted permission by the producers. I believe that the burden of proof that a higher capacity system is required is on the producers.

A second consideration is the possibility of a differential tendency to cost overrun between the 1260-psig system and the higher pressure alternatives. As discussed in a previous section, such a tendency would displace upward the throughput volume threshold where a higher pressure alternative has a lower unit cost-of-service than the 1260-psig system. Further studies of the cost overrun problem are currently in progress,48/ and should be available for evaluation in the event that an initial burden of proof regarding volumes available for throughput had been satisfied.

3. Resolution of Extraordinary Financing Problems

I believe that requiring the chosen system to be privately financed is an integral part of an elaborate framework set out in the President's Decision to ensure that construction of the selected system is in the public interest. I also feel that it would be inappropriate for the Commission to make any decision which would undermine a component of that framework. I believe that a showing that any extraordinary financing problems associated with choosing a higher pressure system had been resolved would be an essential element in any such choice by the Commission.

48/ For example, the Rand Corporation has been studying this problem applied to coal gasification plants for the Department of Energy.

VIII. RESULTS OF CONFERENCE

An earlier draft of this report was circulated for comment in late September 1978, to the parties with whom we had discussed this matter. The same draft was sent to all parties in Docket No. CP78-123, et al., during November, 1978.

The comments I received indicated a number of corrections to be made which have been incorporated as appropriate but did not alter my basic assessment of the difficulties involved in reaching a determination to increase the operating pressure from the level which had been approved as part of the President's Decision.49/

An on-the-record conference of interested parties was held on December 15, 1978. At that conference I presented a proposition, which had been suggested in the comments of the State of Alaska on my draft report, for consideration by the project sponsors and any other interested parties. That proposition was to first construct and operate the pipeline at 1260 psig, and then to increase operating pressure of the pipeline if sufficient throughput volumes became available during the operating life of the pipeline to warrant the increase. The State of Alaska suggested that it might be

> ...possible to achieve operating pressures approaching 1440 psig by relaxation of the "design factor" for the pipe Northwest proposes to use from .72 to .8. See 49 CFR 192.111. This would not be a substantial change because the "relaxation" is only to the established Canadian standard. A waiver request would have to be presented to the Office of Pipeline Safety [Department of Transportation] but a good case would be made that safety concerns would be satisfied by the relaxed design factor based on the record in Canada (November 17, 1978, Comments, p. 7)

49/ The U.S. Department of Transportation expressed some concern over perverse incentives inherent in the way natural gas pipeline projects are regulated. I took note of their concerns but advised them that the Commission would likely be unable to resolve them.

The Department of Transportation (DOT) and its Office of Pipeline Safety were represented at my conference. Their representatives were not encouraging about the prospects for a waiver because of the proximity of the pipeline to the haul road which serves the North Slope producing area. DOT safety requirements are more stringent for gas pipelines which operate near highways50/; thus, sufficient relaxation of the standard to accommodate an increase in operating pressure would likely require a double waiver. The DOT representatives advised use of thicker-wall pipe if higher operating pressures were to be attempted.

I closed the conference by requesting that the project sponsors present their views on the operating pressure question in detail to the State of Alaska and the DOT, both of whom appeared to favor a higher capacity system.51/ The sponsors were then to report to the Commission on their views regarding the possibility of increasing the system capacity, and on the results of their discussions of this matter with other interested parties. The sponsors' filing of March 2, 1979, requesting a Commission order finalizing the selection of 1260 psig as the operating pressure for the Alaska segment, is in compliance with my request. A copy of that filing is attached to this report.

50/ Whether the haul road is properly classified as a "highway", and thus imposes the more stringent safety standard on the gas pipeline, is a matter which I believe is still at issue.

51/ Arco representatives, both in their comments on my draft report and in their remarks at my conference, favored increasing the operating pressure but reducing the diameter of the gas pipeline system. Exhibit Z-5, attached to the project sponsors' March 2, 1979, filing, indicates that the operating efficiency characteristics of the 1680-psig, 42-inch system which Arco favors are essentially the same as those for a 1260-psig, 48-inch system.

IX. CONCLUSIONS AND RECOMMENDATIONS

Relevant Considerations

As discussed in section IV above, the primary method of analysis to determine the appropriate throughput capacity for a gas pipeline is the comparison of plots of unit transportation cost vs. throughput volume for alternative system configurations. The project sponsors have attached such plots for the principal alternative systems as Exhibits Z-4 and Z-5 in their filing. Similar computations are also included in section IV of this report.

In my judgement, there are two factors in these comparisons which should be considered:

- The least-cost system at expected levels of throughput, and
- Expectations about the throughput levels for which fuel penalties start to significantly increase the unit transportation cost.

For expected levels of throughput up to 3.3 bcfd, the 1,260-psig system is indicated by the project sponsors' analysis. Although our analysis puts the crossover point from the 1,260-psig system to the 1,440-psig system slightly lower than the project sponsors',52/ our analysis also supports the 1,260-psig system if the expected levels are in the 2.8-to 2.9-bcfd range.

Perhaps more important, in my judgement, is an assessment of the likelihood that throughput levels will exceed the range of efficient operation for the recommended system. For the three systems which appear to be feasible for the Alaska segment--1,260, 1,440 and 1,680 psig systems--there is a considerable range of throughput volumes for which there is probably sufficient uncertainty the capital cost

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52/ Our results put the crossover point at 2.65 to 2.9 bcfd, depending on certain assumptions about capital costs other than for compression. The remainder of the difference between our analysis and Alaskan Northwest's is in the installed cost of compression and chilling facilities.

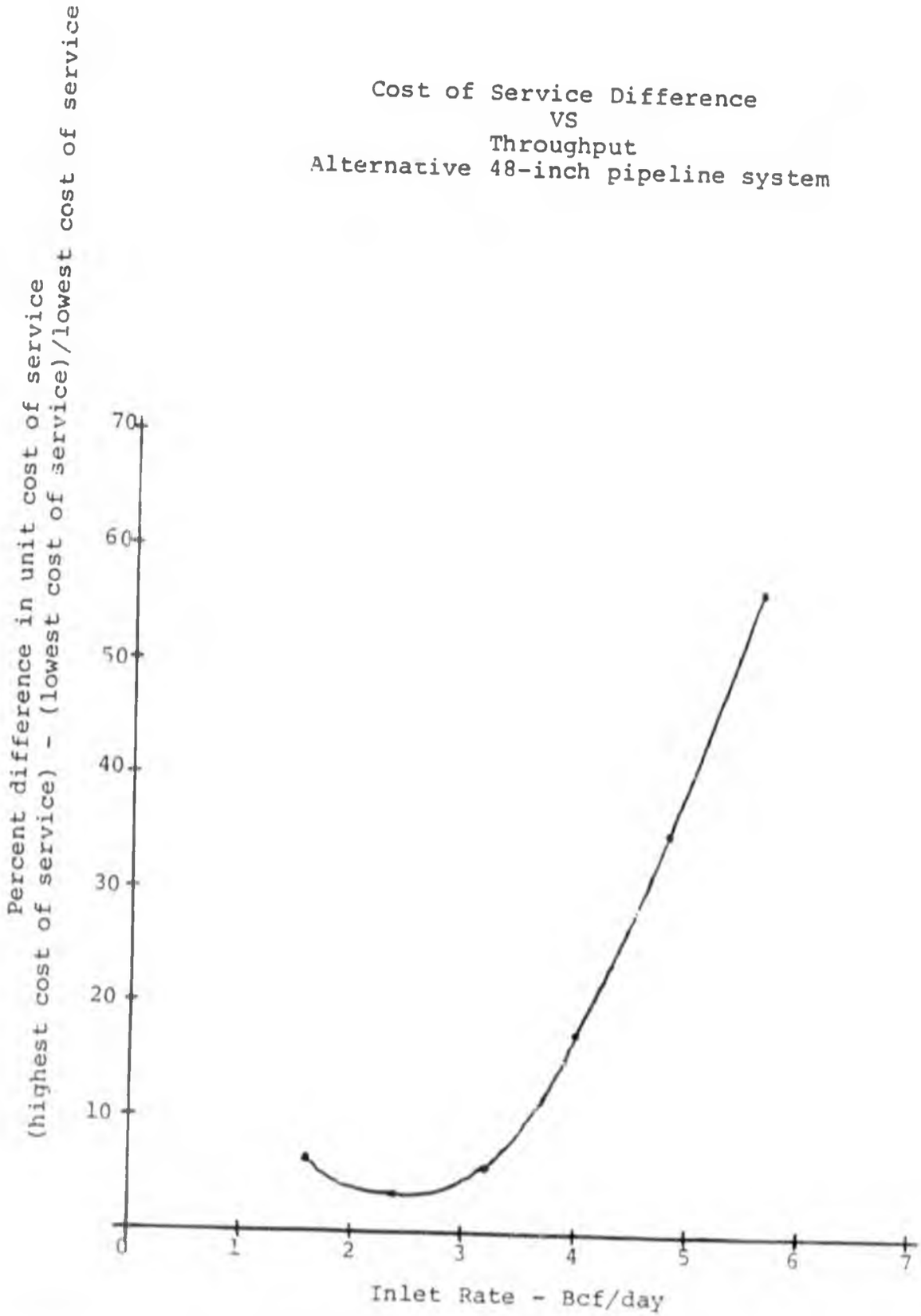
I would caution against assigning undue precision to the exact crossover points from one system to another. The differences between Northwest's capital cost estimates and ours for the 1,680-psig system is $48.3 million, or less than 3 percent of the base 1,260-psig estimate, whereas the expected cost overrun for the 1260 psig case is about 30 percent of that estimate.

estimates upon which the cost of service calculations are based to prevent a definitive conclusion that one will have a lower unit cost of service than another. For example, if I arbitrarily pick a difference of 10 percent between the cost of service of the lowest and highest cost systems for a given throughput level as a difference which is significant, then the unit cost of service for all three systems would be essentially the same from a throughput of about 2.6 bcfd to almost 4.0 bcfd, according to Alaskan Northwest's Exhibit Z-4. Above 4.0 bcfd and below 2.6 bcfd, the three curves diverge more rapidly.

Our computations in section IV illustrate better the divergence of the "J-Curves" at higher throughput volumes because we have plotted them for a larger range of throughput. On the next page, I have used the data from my Figure 1 to plot the difference between the lowest and highest cost systems as a percent of the lowest cost system for various levels of throughput. Notice that because of differences in our respective capital cost figures, our 10-percent difference point is closer to 3.5 bcfd than Alaskan Northwest's 4.0 bcfd. However, the plot illustrates that, although the differences are small over a range of throughput, they increase rapidly as the upper end of the range of efficient operation for the 1,260-psig system is approached.

In section VII of this report, I discussed the difficult problems which would have to be resolved to reach a determination to increase the operating pressure of the Alaskan segment. I believe that the Commission need not address these problems unless there is a significant change in expectations about gas volumes available from the producing areas to be served by the ANGTS. In view of the difficulties discussed in my report and in view of the relatively small differences in unit costs of service over the range of at least 2.6 to 3.5 bcfd, I would recommend that you reaffirm the 1,260-psig system for the Alaskan segment unless you are provided with new information which demonstrates that there is a significant probability of volumes in excess of 4.0 bcfd in the area to be served by the ANGTS.

Cost of Service Difference
VS
Throughput
Alternative 48-inch pipeline system



Status of Information

The information available at the time of the Decision, the results of the extensive analysis by the FPC and the July 1, 1977, Report to the President of the Working Group on Supply, Demand and Energy Policy Impacts of Alaska Gas, are cited in the project sponsors' filing. They cite the relevant conclusion in the Decision as the following:

> Peak-day capacity utilizing nine compressor stations will be 2.6 bcfd, with an average daily volume of 2.4 bcfd. By installation of intermediate compressor stations, the system could be increased to 3.4 bcfd peak capacity, with an average day capacity of 3.2 bcfd. The system capacity could be further increased by addition to the compressor horsepower at each station. (Decision, p. 17.)

I also note in the report accompanying the Decision the following passage:

> The routing of the Alcan system provides future access to reserves which might be discovered in the Beaufort Sea or elsewhere on the North Slope. Alcan similarly could transport gas from other areas of Alaska or even from the Gulf of Alaska by means of somewhat longer supply laterals. Further, the Agreement with Canada provides for the use by Canada of the Alcan main line at a throughput up to 1.2 bcfd. Therefore, redesign of the system to enable inexpensive expansibility up to 3.9 to 4.0 bcfd south of Whitehorse, Yukon Territory, is essential. (Decision, p. 196.)

I infer from this passage that the throughput volume anticipated at that time from sources in Alaska which might be connected to the ANGTS was in the range of 2.7 to 2.8 bcfd (3.9 to 4.0 bcfd less 1.2 bcfd).

Interestingly, the principal concern about throughput volume at the time of Congressional consideration of the Decision was that Prudhoe Bay Field production might not come up to expectations, and thus the system selected by the President might be too large for the available volumes. 53/ Some perspective on the possibility that available volumes will be either higher or lower than expected was provided to us in the course of this inquiry by the State of Alaska. As both a royalty owner and the conservation authority for the primary prospective areas on the North Slope, the State's information on these areas must be presumed to be as complete as anyone's. I have reproduced on the next two pages a series of tables of expected reserves and deliverability, along with a map of the area covered by the estimates. As you can see from the tables, the estimated probability that available throughput volumes will be 4.2 bcfd is about the same as the probability that throughput will be only 2.0 bcfd. I don't see any basis in this information for changing from the 1260 psig system.

The CO_2 Standard

A matter which I feel ought to be considered further is the CO_2 standard for gas delivered to the pipeline. I mentioned above (p. 22) that the Parsons study recommends further study of possible alternative specifications for CO_2 content and gas pipeline pressure. Increasing the system operating pressure is difficult for all the reasons discussed above, but I believe changing the CO_2 specification is separable and should be considered. The potential benefits to be derived from transporting more CO_2 include reduced conditioning costs, increased capacity for transporting NGL's, and possibly increased availability of NGL's (particularly propane) due to reduced fuel requirements of a less intensive processing and conditioning plant operation. The State of Alaska and Arco 54/ raised the CO_2 issue in comments

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53/ See the very extensive discussions of this matter during the Senate consideration of the Decision. Hearings before the Committee on Energy and Natural Resources, United States Senate, on S.J. Res. 82, Joint Resolution to Approve the Presidential Decision on an Alaska Natural Gas Transportation System, September 26, 27, October 11, 12 and 25, 1977. Publication No. 95-73.

54/ "Comments of the State of Alaska on the Design Specifications and Initial System Capacity of the Alaskan Segment of the Alaska Highway Pipeline Project", and "Motion of Atlantic Richfield Company for Clarification," both filed in Alaska Northwest Natural Gas Transportation Company, Docket No. CP78-123, et. al. on April 5, 1979.

North Slope
Original Gas In Place
Trillion Cubic Feet

	Confidence Level		
	95	50	5
Prudhoe Bay	←	40.4	→
All Other	0.5	13.4	30.5

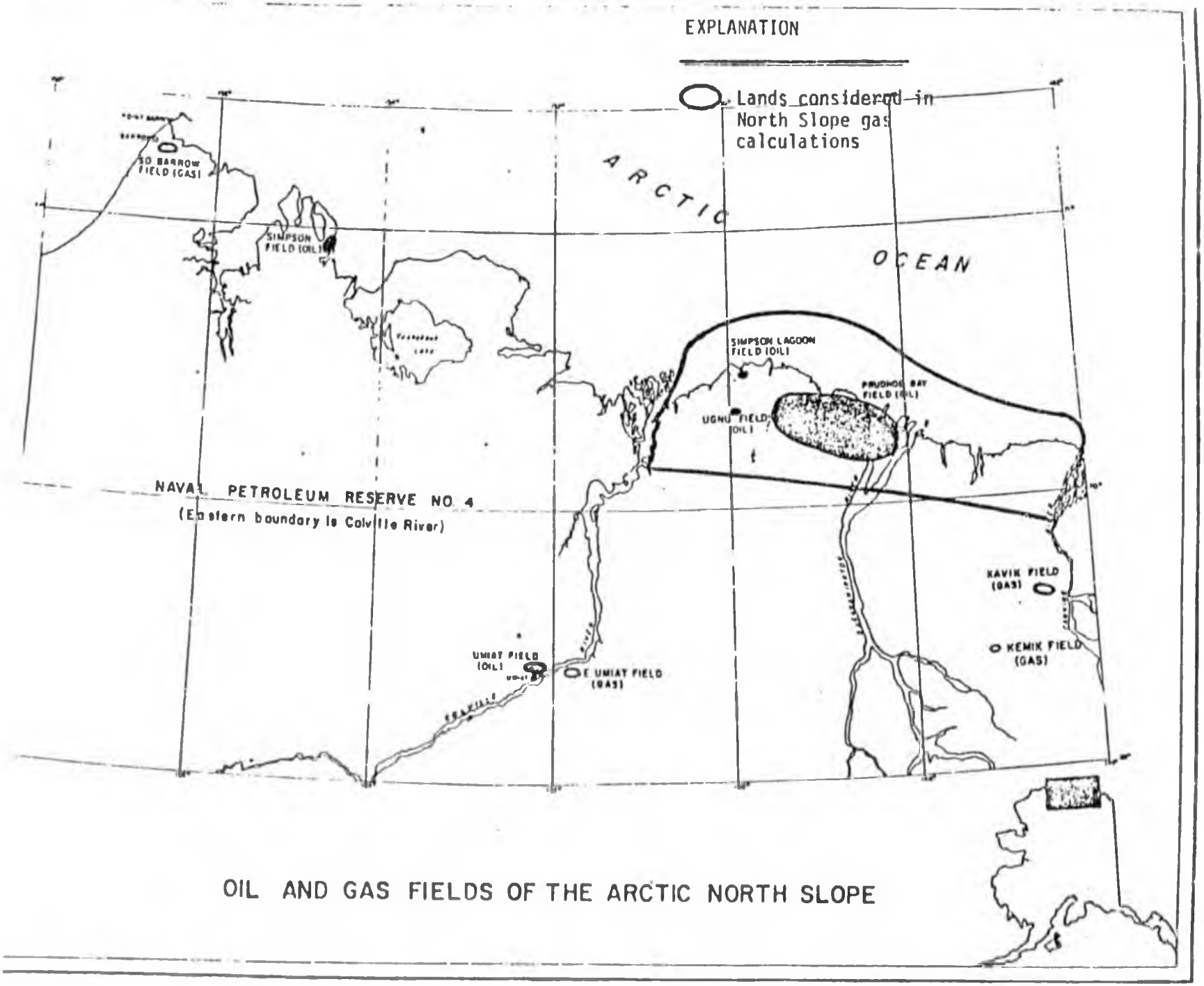
Recoverable Reserves *
Trillion Cubic Feet

	Confidence Level		
	95	50	5
Prudhoe Bay	←	21.0	→
All Other	0.3	8.0	18.3

Deliverability
Billion Cubic Feet Per Day

	Confidence Level		
	95	50	5
Mid 1984			
Prudhoe Bay	1.5	2.0	2.5
All Other	0	0.3	0.5
Mid 1988 and Beyond			
Prudhoe Bay	1.5	2.0	2.5
All Other	0.5	0.8	1.7

* takes into account recovery factor, gas conditioning and fuel useage.



OIL AND GAS FIELDS OF THE ARCTIC NORTH SLOPE

on the project sponsors' March 2, 1979 filing regarding system operating pressure. Sohio 55/ has raised the subject of standards for "pipeline quality gas" in the Commission's omnibus rulemaking proceeding on tariff and rate of return issues in Docket No. RM78-12.

The North Slope producers and the State of Alaska have an additional interest in this matter because of the impact of butane blending on the vapor pressure of North Slope crude. Exxon had furnished the plot of vapor pressure vs. temperature for North Slope crude containing various amounts of NGL's which appears on the following page. I have superimposed on that plot the approximate temperature range at which wax formation starts to be a problem with the North Slope crude, and the vapor pressure standard for air pollution control in Southern California.

Wax formation limits the use of cooling as a technique for vapor pressure control. If cooling cannot be used, then vapor recovery systems must be installed on storage facilities to control emissions. Addition of any butane at all to the crude stream moves the vapor pressure at a given temperature from curve 2 toward curves 3 and 4. Because of the temperature limit imposed by wax formation, addition of any butane at all increases the likelihood that vapor recovery systems will be required, particularly if the vapor pressure standard is made more stringent. Thus, the North Slope producers have an interest in the CO2 standard not only because of its impact on the cost of the conditioning facility, but also because of its impact on the capacity of the sales gas stream to transport NGL's, particularly butane.

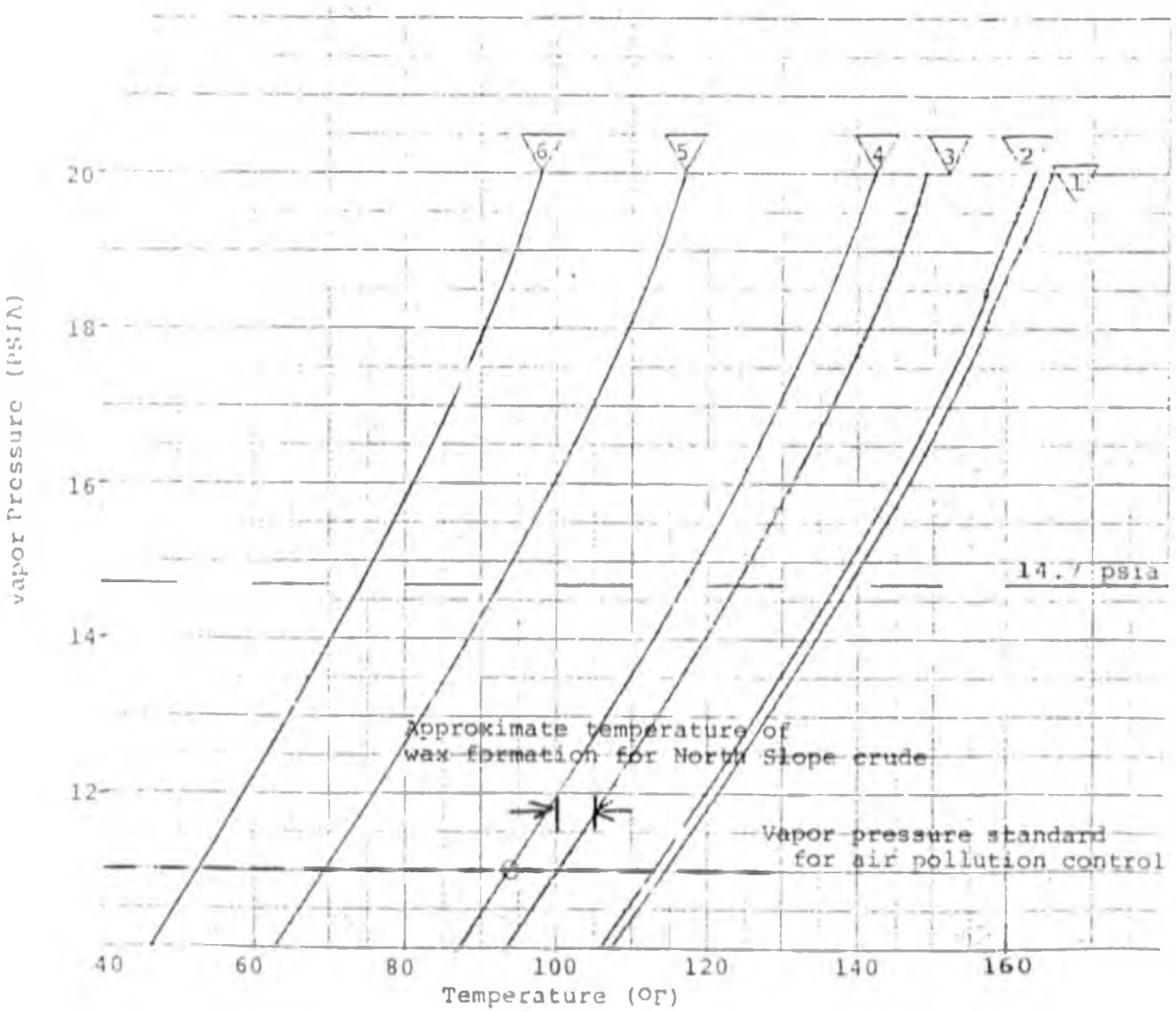
Increasing the CO2 content of the gas stream may be cost-effective for the consumer also. Without pre-judging how additional NGL's might be charged for transportation through the ANGTS, i.e., whether transportation charges would be on a cents per mmBtu basis or on some other basis, transportation of more of the Prudhoe Bay hydrocarbon reserve through the ANGTS offers the prospect of increased utilization of the facility, and, hence, lower overall costs to consumers.

55/ "Comments of Sohio Natural Resources Company on Notice of Proposed Rulemaking Issued April 6, 1979", filed in Determination of Incentive Rate of Return, Tariff and Related Issues, Docket No. RM78-12, on May 7, 1979.

FIGURE 1

PRUDHOE BAY CRUDE + NGL VAPOR PRESSURE

Bbl.NGL/Bbl.Crude	Mixture
0	1 Crude
.0154	2 Crude + iC5+
.0301	3 Crude + NC4+
.0367	4 Crude + iC4+
.0470	5 Crude + 25% C3, iC4+
.0573	6 Crude + 50% C3, iC4+



Increasing the CO2 content of the sales gas stream would have the effect of shifting to consumers certain costs of processing and conditioning the Prudhoe Bay gas, an outcome which the Commission has expressed its intention to prohibit with its proposed policy regarding the recovery of certain "production-related" costs as defined in the Natural Gas Policy Act. 56/ However, it is possible that some cost-shifting through relaxation of the CO2 standard would be the optimal solution for the overall conditioning and gas transmission system.

Increasing the CO2 content of the sales gas stream would pre-empt some of the ANGTS throughput capacity, but additional processing and conditioning facilities could be installed to remove the extra CO2 if the additional capacity were required. This could be done without any loss of NGL's carrying capability if incremental volumes of natural gas have a lower NGL's content than the Prudhoe Bay gas.

The State of Alaska and Arco, in their above referenced comments on Alaskan Northwest's March 2 filing, have requested a Commission statement regarding the appropriate proceeding for resolution of the CO2 content issue. I believe this issue is separable from the throughput capacity issue, because any capacity committed to CO2 transportation when operations begin can be retrieved by installation of additional conditioning facilities if sufficient quantities of natural gas become available to require that capacity. Thus, I believe that the maximum allowable operating pressure question should be resolved independent of the CO2 question, the latter being better addressed in RM78-12, wherein the Commission is considering the project company tariffs, or perhaps as an ancillary issue in RM79-19, regarding the responsibility for production-related costs. It is the former proceeding in which the issue of appropriate standards for "pipeline quality gas" seems to me to be most directly before the Commission.

56/ See the Commission's Notice of Proposed Rulemaking in RM79-19, February 2, 1979.

FERC -

ANNGTC

segment

Design Spec +

Sys. Capacity

Colletta

NORTH POLE [illegible]

[illegible]

FEDERAL [illegible]

ANGTS [illegible]

Before Commissioners: Charles B. Curtis, [illegible]
Georgiana [illegible], Jr.

Alaskan Northwest Natural Gas Transportation Company-- Pipeline Design and Capacity	)))	Docket Nos. [illegible]-123, *et al.*

ORDER APPROVING ALASKA SEGMENT DESIGN
SPECIFICATIONS AND INITIAL SYSTEM CAPACITY

(Issued August 6, 1979)

On March 2, 1979, Alaskan Northwest Natural Gas Transportation Company (Alaskan Northwest) filed an application pursuant to the Alaska Natural Gas Transportation Act of 1976 (ANGTA), the President's Decision 1/ and Section 7 of the Natural Gas Act, requesting that the Commission issue an order setting the design specifications and initial capacity for the Alaskan segment of the Alaska Natural Gas Transportation System. Notice of the application was issued on March 16, 1979. 2/ On May 17, 1979, the Commission issued an Order serving on all parties a copy of the Report of the Alaskan Delegate on the System Design Inquiry, 3/ and inviting comments on the Report as well as on Alaskan Northwest's application. Comments were received from Alaskan Northwest, the State of Alaska, and North [illegible]

1/ Executive Office of the President, Energy Policy and Planning, *Decision and Report to Congress on the Alaska Natural Gas Transportation System* (September, 1977).

2/ The Notice was published in the Federal Register on March 26, 1979 (44 FR 18050).

3/ The Delegate's Report addressed the matters which are the subject of the application, i.e., the diameter of [illegible] operating [illegible] of the pipeline.

Company of Alaska. The May 17 Order [illegible] a procedure by which a hearing could be held on the factual questions involved in relating diameter and operating pressure of the pipeline. No party has requested such a hearing pursuant to the procedures specified.

The Delegate's Report contains [illegible] relevant portions of the President's Report accompanying the Decision, the issues, as well as various studies, reports, and [illegible] that were considered by the Delegate in selecting the design specifications for the pipeline. The Delegate's Report, including all of the materials cited or used in the preparation of the Report, 4/ and the application of Alaskan Northwest and exhibits thereto, along with the comments received in response to the May 17 Notice, constitute the record in this proceeding.

The Delegate's essential conclusions and recommendations in his Report were that the President's decision set the diameter of the pipeline at 48 inches, that the maximum allowable operating pressure should be set at 1,050 psig, and that the carbon dioxide

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4/ These materials include, inter alia, written comments (including information responses) received by the Delegate during the course of preparation of an earlier draft of his Report, that earlier draft report, the comments received on that draft, the transcript of the conference he held, and various studies he had consulted in reaching his conclusions. Those studies include, inter alia, "September 1978 Study Report, Felco Gas Conditioning Facilities, Prudhoe Bay, Alaska," prepared by the Ralph M. Parsons Co. [illegible] by a group of North Slope producers and potential shippers of the gas; that study was made available to the Delegate and to other government representatives in early October, 1978. As indicated in the Report, all of these materials are maintained in a [illegible] file in the Delegate's office, as required by the Commission's Order of December 15, 1977, and [illegible] available for reference and inspection by all parties.

content of the gas stream should be considered in a separate order. 5/ The specifications [illegible] by the Delegate are the same as [illegible] by Alaskan Northwest in its application, 6/ and are also the same as those in the Alcan proposal [illegible] by the President's Decision.

The President's Decision [illegible] that the diameter of the pipeline will be [illegible] inches. 7/ [illegible] the Decision creates a [illegible] is the one authorized by the [illegible] and the Congress, by stating that the facilities [illegible] and subject to the provisions of [illegible] the [illegible] included in the revised Alcan filing [illegible] to the Federal Power Commission (FPC) on March 2, [illegible]7. 8/ The Alcan proposal was to operate the pipeline at a maximum pressure of 1260 psig. The language in the Report accompanying the Decision suggesting that

> . . . Alcan should consider increasing the operating pressure and wall thickness of its 48-inch diameter pipeline in order to allow for more efficient increases in throughput rate for additional reserves which might be committed to the system from either Alaskan or Canadian sources. . . 9/

5/ The Commission's May 17 Order stated that the carbon dioxide content issue would not be decided in response to comments received in this proceeding. On May 1[illegible], 1979, the Commission issued an order in Docket No. RM78-12, requesting submission in that docket of studies and comments with respect to the carbon dioxide content issue.

6/ Alaskan Northwest also seeks authorization for their proposed compressor station size and spacing. These are not addressed in the Delegate's Report but are part of the Alcan proposal. No comments were received on that subject.

7/ Decision at 13: "the gas transportation system will utilize a 48-inch diameter pipeline from Prudhoe Bay to James River, Alberta . . . except as modifications to those facilities are required by the Agreement on Principles between the U.S. and Canada. . ."

8/ Decision at 13.

9/ Report accompanying Decision [illegible] 13.

would make the predisposition a rebuttable one on appropriate showings. The President's Decision also stated that the capacity of the system should be adequate for an average daily throughput of up to [illegible] billion cubic feet per day (Bcfd), [illegible] capacity of 2.2 Bcfd. 10/ [illegible] be satisfied by a combination of [illegible] 1260 psig pressure. The comments did not offer any new information as to the amount of gas that is expected to be available for transportation through the pipeline, nor any other information that would call for a different conclusion about the required capacity of the pipeline from that stated in the President's Decision.

The choice of operating pressure is important, not only because of the relationship of the pressure to the capacity throughput of the pipeline, but also because there is some relationship between the pressure and the ability of the gas stream to carry natural gas liquids. This latter relationship was the major focus of the comments received from the State of Alaska and Earth Resources. The State of Alaska 11/ [illegible] concern about the ability of the gas stream to carry natural gas liquids because Alaska would like to preserve the option of developing, in Alaska, a petrochemical petrochemical industry using the natural gas liquids. Alaska is concerned that an operating pressure of 1260 psig, in conjunction with other factors, such as the standard for carbon dioxide content in the gas stream and the type of process utilized for carbon dioxide removal, could preclude the development of a petrochemical industry in Alaska. Alaska is also concerned about the location of the conditioning facility, and believes that alternative sites (i.e., other than [illegible]) for the facility should be given serious consideration, either in this proceeding or in connection with the

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10/ Decision at 13, 17.

11/ The State of Alaska filed two sets of comments, one on April 5, 1978, and [illegible] other on July 3, 1978.

environmental analysis. 12/ [illegible] pressure bears upon the location of the conditioning facility because the proposal, involving location of the facility in Fairbanks, would require a higher operating pressure between Prudhoe Bay and Fairbanks. 13/

The comments filed by Earth Resources also focused upon the location of the conditioning facility, and supported locating the facility at Fairbanks. Both Earth Resources and Alaska referred to a study which purportedly shows that the costs of constructing the conditioning facility in Fairbanks would be lower than the costs of constructing it at Prudhoe Bay. 14/

The Delegate's Report indicates that the amount of natural gas liquids carried in the gas stream is dependent upon the carbon dioxide content of the gas as well as the pressure. 15/ The Commission has previously indicated, by its Order issued May 16, 1979 in Docket Nos. RM78-12 and RM 78-19, that it will decide the appropriate carbon dioxide standard in an order to be issued in Docket No. RM78-12. For the reasons stated below, the Commission prefers to consider the complex liquids carrying issue in the context of the carbon dioxide proceeding rather than delaying a decision on the pressure.

No party questions the choice of 48 inches as the appropriate diameter for the pipe. In its comments Alaska does not specifically oppose the choice of 1260 psig as the appropriate pressure, nor does Alaska specifically advocate any particular alternative pressure. Instead, the basic thrust of Alaska's position is that the issue of the appropriate pressure is complex; that it is related to other issues, such as the liquids carrying capacity of the pipeline, the carbon dioxide content of the gas stream, and the various facilities that might be appropriate for processing and conditioning the gas; and that the Commission ought to delay its decision pending further factual inquiry.

12/ The Draft Environmental Impact Statement discussing inter alia the alternative sites for the conditioning facility was issued July 27, 1979.

13/ Comments of Earth Resources Company of Alaska (July 2, 1979).

14/ Other evidence in the record indicates the contrary. See the Delegate's Report at pp. 8-10, 12.

15/ Delegate's Report at pp. 10-21, 31-35.

Alaskan Northwest, the project sponsor, specifically advocates the selection of 1260 psig as the appropriate operating pressure and, as discussed above and in the Delegate's Report, the President's Decision itself creates a strong presumption in favor of that choice. The record before us supports the choice of 1260 psig, and does not support another choice.

The basic issue, therefore, is whether the Commission should decide the pressure now, or delay its decision pending further proceedings to compile a more extensive record. In this regard, Alaskan Northwest states in its comments that a choice of any pressure other than 1260 psig would substantially delay the project:

> . . . The partnership continues to assume the pipe size, design pressure and system capacities for which approval has been requested in connection with engineering, test programs, and field programs which have been completed and are currently in progress. Any deviation from these specifications will result in a major delay of the project.

In light of the presumptions set forth in the President's Decision, the partnership's reliance on its stated assumptions was certainly reasonable and well founded.

We would also note that the design of the system has a direct bearing on its cost, that a decision on the operating pressure is an essential predicate to defining the design, and that the project sponsors' ability to prepare detailed cost estimates has an obvious bearing on their ability to proceed with arrangements to obtain financing for the project. Thus, a delay in determining the pressure could have serious and wide ranging consequences in delaying the entire project.

The Congress, through its enactment of ANGTA, and the President, through his Decision, have declared the ANGTS to be uniquely important to our nation's ability to obtain new sources of domestic energy. The entire thrust and purpose of ANGTA, as well as its explicit mandate, is to expedite the authorization, construction and operation of the ANGTS. [illegible] decision that we cannot [illegible] action to delay making a decision.

We recognize that our decision [illegible] on the liquids carrying capacity of the pipeline, [illegible] the capacity is also [illegible] by [illegible] the carbon dioxide content of [illegible] the nature of the [illegible]. We also recognize that [illegible] on the location of these [illegible]. All of these considerations, however, [illegible] our decision. In light of the President's Decision, the overriding consideration in determining the operating pressure of the pipeline is the pipeline's throughput capacity. 16/ As discussed above, absent evidence as to a need for increased capacity, the President's Decision creates a presumption that the operating pressure should be 1260 psig. There is no evidence in the record that the volume of gas expected to be transported through the pipeline from Prudhoe Bay has changed such as to indicate that increased pressure, and thereby increased capacity, are required. Accordingly, upon consideration of the record, the Commission has determined that the Alaska segment of the ANGTS should be operated at a maximum allowable operating pressure of 1260 psig.

The Commission finds:

The design specifications and initial [illegible] capacity for the Alaskan segment of the Alaskan Natural Gas Transportation System, as proposed by Alaskan Northwest in its application filed on March 2, 1979, are required by the public convenience and necessity and should be incorporated as part of the conditional certificate of public convenience and necessity issued by the [illegible] Order of December 16, 1977 in this docket.

The Commission orders:

(A) The design specifications for the Alaskan segment of the Alaskan Natural Gas Transportation System shall be as follows:

1. 48-inch diameter pipe size;

2. 1260 psig maximum allowable operating [illegible].

16/ See Delegate's Report at p. 28.

3. [illegible] pressor station [illegible]
[illegible] capacity of [illegible]
of [illegible]
[illegible]

all as proposed by [illegible]
[illegible], 1979, in this [illegible].

(B) The requirements of ordering paragraph [illegible] above shall be incorporated into the [illegible] certificate of public convenience and necessity issued by the Commission's Order of [illegible] 16, 1977 in this docket, pursuant to the provisions of the Alaska Natural Gas Transportation Act, the President's Decision, and the Natural Gas Act.

(C) This Order shall become effective on its date of issuance. Pursuant to sections 9 and 19 of the Alaska Natural Gas Transportation Act, this order constitutes final agency action and is not subject to the provisions for rehearing set forth in § 19 of the Natural Gas Act and in § 1.34 of the Commission's Rules of Practice and Procedure.

By the Commission.
(S E A L)

Lois D. [illegible],
[illegible]

Collette

RHL

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

ANGTS

Before Commissioners: Charles B. Curtis, Chairman;
Georgiana Sheldon, and Matthew Holden, Jr.

Alaskan Northwest Natural Gas Transportation Company-- Pipeline Design and Capacity	)))	Docket Nos. CP78-123, et al.

ORDER APPROVING ALASKA SEGMENT DESIGN SPECIFICATIONS AND INITIAL SYSTEM CAPACITY

(Issued August 6, 1979)

On March 2, 1979, Alaskan Northwest Natural Gas Transportation Company (Alaskan Northwest) filed an application pursuant to the Alaska Natural Gas Transportation Act of 1976 (ANGTA), the President's Decision 1/ and Section 7 of the Natural Gas Act, requesting that the Commission issue an order setting the design specifications and initial capacity for the Alaskan segment of the Alaska Natural Gas Transportation System. Notice of the application was issued on March 16, 1979. 2/ On May 17, 1979, the Commission issued an Order serving on all parties a copy of the Report of the Alaskan Delegate on the System Design Inquiry, 3/ and inviting comments on the Report as well as on Alaskan Northwest's application. Comments were received from Alaskan Northwest, the State of Alaska, and Earth Resources

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

2/ The Notice was published in the Federal Register on March 26, 1979 (44 FR 18060).

3/ The Delegate's Report addressed the matters which were the subject of the application, i.e., the diameter of and maximum allowable operating pressure of the pipeline.

Company of Alaska. The May 17 Order also specified a procedure by which a hearing could be requested on the factual questions involved in determining the diameter and operating pressure of the pipeline. No party has requested such a hearing pursuant to the procedures specified.

The Delegate's Report contained a review of the relevant portions of the President's Decision, and the Report accompanying the Decision, that bear upon these issues, as well as various studies, reports, and comments that were considered by the Delegate in evaluating the design specifications for the pipeline. The Delegate's Report, including all of the materials cited or used in the preparation of the Report, 4/ and the application of Alaskan Northwest and exhibits thereto, along with the comments received in response to the May 17 Notice, constitute the record in this proceeding.

The Delegate's essential conclusions and recommendations in his Report were that the President's Decision set the diameter of the pipe at 48 inches, that the maximum allowable operating pressure should be set at 1260 psig, and that the carbon dioxide

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4/ These materials include, inter alia, written comments (including information responses) received by the Delegate during the course of preparation of an earlier draft of his Report, that earlier draft report, the comments received on that draft, the transcript of the conference he held, and various studies he had consulted in reaching his conclusions. Those studies include, inter alia, "September 1978 Study Report, Sales Gas Conditioning Facilities, Prudhoe Bay, Alaska," prepared by the Ralph M. Parsons Company, and sponsored by a group of North Slope producers and potential shippers of the gas; that study was made available to the Delegate and to other government representatives in early October, 1978. As indicated in the Report, all of these materials are maintained in a public file in the Delegate's office, as required by the Commission's Order of December 16, 1977, and have been available for reference and inspection by all parties.

content of the gas stream should be considered in a separate order. 5/ The specifications recommended by the Delegate are the same as those proposed by Alaskan Northwest in its application, 6/ and are also the same as those in the Alcan proposal approved by the President's Decision.

The President's Decision decided that the diameter of the pipeline will be 48 inches. 7/ Moreover, the Decision creates a predisposition that the 1260 psig system is the one authorized by the President and the Congress, by stating that the facilities approved and subject to the provisions of ANGTA are those included in the revised Alcan filing submitted to the Federal Power Commission (FPC) on March 8, 1977. 8/ The Alcan proposal was to operate the pipeline at a maximum pressure of 1260 psig. The language in the Report accompanying the Decision suggesting that

> . . . Alcan should consider increasing the operating pressure and wall thickness of its 48-inch diameter pipeline in order to allow for more efficient increases in throughput rate for additional reserves which might be committed to the system from either Alaskan or Canadian sources. . . 9/

5/ The Commission's May 17 Order stated that the carbon dioxide content issue would not be decided in response to comments received in this proceeding. On May 16, 1979, the Commission issued an order in Docket No. RM78-12, requesting submission in that docket of studies and comments with respect to the carbon dioxide content issue.

6/ Alaskan Northwest also seeks authorization for their proposed compressor station size and spacing. These were not addressed in the Delegate's Report but were part of the Alcan proposal. No comments were received on that subject.

7/ Decision at 13: "the gas transportation system will utilize a 48-inch diameter pipeline from Prudhoe Bay to James River, Alberta . . . except as modifications to those facilities are required by the Agreement on Principles between the U.S. and Canada. . ."

8/ Decision at 13.

9/ Report accompanying Decision at 193.

would make the predisposition a rebuttable one on appropriate showings. The President's Decision also stated that the capacity of the system should be adequate for an average daily throughput of up to 2.4 billion cubic feet per day (Bcfd), and with increased compression, capable of increasing to an average daily capacity of 3.2 Bcfd. 10/ Those requirements would be satisfied by a combination of 48-inch pipe and 1260 psig pressure. The comments did not offer any new information as to the amount of gas that is expected to be available for transportation through the pipeline, nor any other information that would call for a different conclusion about the required capacity of the pipeline from that stated in the President's Decision.

The choice of operating pressure is important, not only because of the relationship of the pressure to the capacity throughput of the pipeline, but also because there is some relationship between the pressure and the ability of the gas stream to carry natural gas liquids. This latter relationship was the major focus of the comments received from the State of Alaska and Earth Resources. The State of Alaska 11/ expressed concern about the ability of the gas stream to carry natural gas liquids because Alaska would like to preserve the option of developing, in Alaska, a world-class petrochemical industry using the natural gas liquids. Alaska is concerned that an operating pressure of 1260 psig, in conjunction with other factors, such as the standard for carbon dioxide content in the gas stream and the type of process utilized for carbon dioxide removal, could preclude the development of a petrochemical industry in Alaska. Alaska is also concerned about the location of the conditioning facility, and believes that alternative sites (i.e., other than Prudhoe Bay) for the facility should be given serious consideration, either in this proceeding or in connection with the

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10/ Decision at 13, 17.

11/ The State of Alaska filed two sets of comments, one on April 5, 1979, and another on July 2, 1979.

environmental analysis. 12/ The decision as to operating pressure bears upon the location of the conditioning facility because one proposal, involving location of the facility in Fairbanks, would require a higher operating pressure between Prudhoe Bay and Fairbanks. 13/

The comments filed by Earth Resources also focused upon the location of the conditioning facility, and supported locating the facility at Fairbanks. Both Earth Resources and Alaska referred to a study which purportedly shows that the costs of constructing the conditioning facility in Fairbanks would be lower than the costs of constructing it at Prudhoe Bay. 14/

The Delegate's Report indicates that the amount of natural gas liquids carried in the gas stream is dependent upon the carbon dioxide content of the gas as well as the pressure. 15/ The Commission has previously indicated, by its Order issued May 16, 1979 in Docket Nos. RM78-12 and RM 79-19, that it will decide the appropriate carbon dioxide st[illegible] in an order to be issued in Docket No. RM78-[illegible]r the reasons stated below, the Commission prefers to consider the complex liquids carrying issue in the context of the carbon dioxide proceeding rather than delaying a decision on the pressure.

No party questions the choice of 48 inches as the appropriate diameter for the pipe. In its comments Alaska does not specifically oppose the choice of 1260 psig as the appropriate pressure, nor does Alaska specifically advocate any particular alternative pressure. Instead, the basic thrust of Alaska's position is that the issue of the appropriate pressure is complex; that it is related to other issues, such as the liquids carrying capacity of the pipeline, the carbon dioxide content of the gas stream, and the various facilities that might be appropriate for processing and conditioning the gas; and that the Commission ought to delay its decision pending further factual inquiry.

12/ The Draft Environmental Impact Statement assessing inter alia the alternative sites for the conditioning facility was issued July 27, 1979.

13/ Comments of Earth Resources Company of Alaska (July 2, 1979).

14/ Other evidence in the record indicates the contrary. See the Delegate's Report at pp. 9-10, 12.

15/ Delegate's Report at pp. 19-21, 61-66.

Alaskan Northwest, the project sponsor, specifically advocates the selection of 1260 psig as the appropriate operating pressure, and indeed, as discussed above and in the Delegate's Report, the President's Decision itself creates a strong presumption in favor of that choice. The record before us supports the choice of 1260 psig, and does not support any other choice.

The basic issue, therefore, is whether the Commission should decide the pressure now, or delay its decision pending further proceedings to compile a more extensive record. In this regard, Alaskan Northwest states in its comments that a choice of any pressure other than 1260 psig would substantially delay the project:

> . . . The partnership continues to assume the pipe size, design pressure and system capacities for which approval has been requested in connection with engineering, test programs, and field programs which have been completed and are currently in progress. Any deviation from these specifications will result in a major delay of the project.

In light of the presumptions set forth in the President's Decision, the partnership's reliance on its stated assumptions was certainly reasonable and well founded.

We would also note that the design of the system has a direct bearing on its cost, that a decision on the operating pressure is an essential predicate to refining the design, and that the project sponsors' ability to prepare detailed cost estimates has an obvious bearing on their ability to proceed with arrangements to obtain financing for the project. Thus, a delay in determining the pressure could have serious and wide ranging consequences in delaying the entire project.

The Congress, through its enactment of ANGTA, and the President, through his Decision, have declared the ANGTS to be uniquely important to our nation's ability to obtain new sources of domestic energy. The entire thrust and purpose of ANGTA, as well as its explicit mandate, is to expedite the authorization, construction and operation of the ANGTS. Thus, the one decision that we cannot and will not make is a decision to delay making a decision.

We recognize that our decision may have some effect on the liquids carrying capacity of the pipeline, but the capacity is also affected by other factors, such as the carbon dioxide content of the gas stream as well as the nature of the conditioning and processing facilities. We also recognize that our decision may have some effect on the location of those facilities. All of those considerations, however, are secondary consequences of our decision. In light of the President's Decision, the overriding consideration in determining the operating pressure of the pipeline is the pipeline's throughput capacity. 16/ As discussed above, absent evidence as to a need for increased capacity, the President's Decision creates a presumption that the operating pressure should be 1260 psig. There is no evidence in the record that the volume of gas expected to be transported through the pipeline from Prudhoe Bay has changed such as to indicate that increased pressure, and thereby increased capacity, are required. Accordingly, upon consideration of the record, the Commission has determined that the Alaska segment of the ANGTS should be operated at a maximum allowable operating pressure of 1260 psig.

The Commission finds:

The design specifications and initial system capacity for the Alaskan segment of the Alaskan Natural Gas Trarsportation System, as proposed by Alaskan Northwest in its application filed on March 2, 1979, are required by the public convenience and necessity and should be incorporated as part of the conditional certificate of public convenience and necessity issued by the Order of December 16, 1977 in this docket.

The Commission orders:

(A) The design specifications for the Alaskan segment of the Alaskan Natural Gas Transportation System shall be as follows:

1. 48-inch diameter pipe size;

2. 1260 psig maximum allowable operating pressure;

16/ See Delegate's Report at p. 58.

3. compressor station size and spacing for an initial capacity of 2.0 to 2.4 Bcfd capable of expansion, through additional compression, to an an average daily volume of 3.2 Bcfd;

all as proposed by the application filed on March 2, 1979, in this docket.

(B) The requirements of ordering paragraph (A) above shall be incorporated into the conditional certificate of public convenience and necessity issued by the Commission's Order of December 16, 1977 in this docket, pursuant to the provisions of the Alaskan Natural Gas Transportation Act, the President's Decision, and the Natural Gas Act.

(C) This Order shall become effective on its date of issuance. Pursuant to sections 9 and 10 of the Alaska Natural Gas Transportation Act, this Order constitutes final agency action and is not subject to the provisions for rehearing set forth in § 19 of the Natural Gas Act and in § 1.34 of the Commission's Rules of Practice and Procedure.

By the Commission.
(S E A L)

Lois D. Cashell,
Acting Secretary.