

MEMORANDUM

State of Alaska

TO: Esther Wunnicke
Commissioner of Natural Resources

DATE: January 20, 1983

FILE NO: 4800.25.AA

TELEPHONE NO: x2400

FROM: Mark Wittow 
Special Assistant

SUBJECT: Comments on the
Governor's Economic
Ct. Gas Report

You have asked for a brief analysis of the January 1983 report by the Governor's Economic Committee on the feasibility of a Trans-Alaska Gas System (TAGS). TAGS would carry unconditioned natural gas and gas liquids from Prudhoe Bay to a Kenai Peninsula tidewater site for liquefaction and subsequent export to Pacific Rim buyers. It would be constructed in stages, transporting 950 million cubic feet per day (mmcf) of raw gas in its first stage, and 2,830 mmcf at full capacity. The project is proposed as an alternative to the somewhat moribund Alaska Natural Gas Transportation System (ANGTS), which has been unable to obtain the necessary financing to begin construction.

The conclusions of the report cite four main advantages for TAGS, which are restated below:

1. Flexibility/Markets

TAGS would enable North Slope gas to be marketed anywhere an LNG tanker could dock, with Pacific Rim countries as the potential purchasers. Markets would include Japan, Taiwan, Korea and the western U.S., as opposed to the U.S. markets to which ANGTS is constrained.

2. Higher Netback Value

LNG is currently sold in Japan for the BTU-equivalent price of crude oil. In the U.S., the prices paid for new gas have been about 40% below parity; hence, sales to Japan would result in comparatively higher prices if transportation costs are similar.

3. Phasing

The phased nature of TAGS lowers the amount of capital that must be raised for the initial construction of the project, and enables later segments to be financed from the cash flow from the initial segment.

4. Liquids to Tidewater

TAGS would carry gas liquids, the feedstock for petrochemical manufacture, without requiring a separate pipeline, as ANGTS would.

The conclusions also state that TAGS "can be built." A detailed review of the report raises serious questions about the ultimate feasibility of the proposal. However, a judgement by the State as to whether ANGTS or TAGS is preferable is largely irrelevant, since the State is not capable of playing a lead role in either project. That role can clearly only be played by the major North Slope producers - Exxon, ARCO and Sohio. Although the State should recognize that its interests may sometimes diverge from those of the producers, it cannot carry a major project without them.

The key questions raised by the report's analytic portion are described below. The current unwillingness of the producers to drop their support for ANGTS in favor of TAGS is largely explained by these considerations.

-- Alaska gas will have a tough time cracking Pacific Rim markets, given the availability of supplies from other sources with lower transportation costs, such as Indonesia, Malaysia and Thailand, Australia and Canada, and potentially from Middle East countries with substantial gas reserves. Demand for LNG in Japan will grow a great deal - but supplies available from these other sources may limit Japan's ability to take the large quantities of Prudhoe gas delivered by TAGS. At Phase I, the volume would be comparable to the quantity currently supplied by Indonesia, Japan's largest LNG source to date. At full volume, TAGS would deliver gas almost equal in volume to Japan's present total consumption. Other Pacific Rim countries expect to use relatively little LNG. (In comparison, at more than double the capacity of TAGS Phase I, ANGTS would deliver gas equalling only 4% of the U.S.'s present consumption.)

Although the Japanese market probably looks better than ANGTS's U.S. market at this point in time, Japanese customers are far from ready to make the kind of commitments necessary to finance a project in Alaska.

-- Even assuming the sale of gas to the Pacific Rim, the project is marginally feasible, if at all. The economic analysis section of the report declines to state conclusions concerning the feasibility of the project, and discusses several possible scenarios that show a negative return to project sponsors and to the state as well. Other problems include capital availability and cost. The assumed higher sales price in Japan does not provide a clear return after

transportation costs are considered. (Similar problems plague ANGTS.)

-- Federal action would be required for the project to move forward. Congress would have to amend the Alaska Natural Gas Transportation Act of 1977 to permit a project other than ANGTS to carry Prudhoe gas to market, in addition to a variety of regulatory approvals that the federal executive branch would have to make. As always, Eastern and Midwestern Congressmen would have problems with encouraging the export of U.S. energy to Japan. The project may have a chance of succeeding as a component of a major U.S.-Japanese trade package. (State Dept. sources report that they will not discuss Alaska gas exports with Japan while ANGTS has the backing of the producers.)

-- TAGS would improve the potential feasibility of petrochemical development in Alaska. However, as the report states, it will be many years before this industry even has a chance to succeed in Alaska, given present market conditions and the development plans of other major gas producers. TAGS would not, by itself, make petrochemical development in Alaska possible.

On a positive note, the report is an excellently conceived alternative proposal, and would form a sound basis for a new project if the producers were to sever their current allegiance to ANGTS. The TAGS report shows that the analysis performed by the State in 1975-77 before supporting the El Paso LNG proposal is still valid today - ANGTS holds no special magic for Alaska, other than its authorizations and existence. But the half a billion dollars spent developing that proposal will not be easily given up by its participants. When the coffin is lowered, the State would do well to encourage consideration of TAGS. Until then, it would be unwise to bury a still breathing, if comatose, project without the power to grant new life to a successor. In conclusion, I do not think that the TAGS report justifies action by the State at the present time.

Two pipeline companies who were members of the ANGTS consortium have written off the project in recent weeks. Their actions could prove to be the first step in the collapse of the ANGTS project - it is too early to tell at this point in time. If ANGTS collapses, the State should reassess its position concerning North Slope gas.

A bit of perspective: the U.S.S.R. has been able to obtain contracts for less than half of throughput of its gasline to Western Europe, and Alberta producers are now attempting to block Dome's proposed LNG export to Japan, due to the low netback value of the gas to be supplied for that project.

Page 4 - Wunnicke/TAGS Report

I have concentrated on the major conceptual points of the TAGS report, and have not discussed the specifics of the quantitative analysis. I would be happy to provide further work in that area or on any other issues in the report of further interest, if you wish.

cc: Robert Maynard, AGO
Ron Ripple, OMB, Strategic Planning
Ben Schlesinger
Bruce Pasternack
Robert Loeffler

PS I have attached
Northwest's analysis
of the TAGS report

TAGS

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JAN 21 1983

Evaluation of "Trans-Alaska Gas System
Economics of an Alternative for North Slope Gas"
(Hickel Committee Report)

H. W. MOLES

Overall Assessment

The proposed Trans-Alaska Gas System (TAGS) is at a stage of development equivalent to ANCTS in 1976, i.e., prior to expenditure of \$700 million and six years of work on data acquisition, planning, and government approvals. Major problems exist with regard to: (1) an unrealistically low cost estimate, (2) greatly underestimated lead times for government-related and engineering requirements, (3) major unanticipated controversies over environmental matters, (4) gross oversimplification of financing requirements, and (5) unrealistic assumptions regarding political acceptability of major gas exports to Japan. The comparison herein is with the ANCTS facilities in Alaska sponsored by the Northwest Alaskan Pipeline Company (NWA). 1/

Unrealistically Low Cost Estimate

- A TAGS cost of \$8.2 billion for the pipeline compared to \$10.8 billion for ANCTS's Alaska pipeline segment, excluding the contingency for abnormal events in Alaska, is not credible because TAGS would involve:
 - Seventy-five (75) miles greater length.
 - Fourteen (14) compressor stations vs. NWA's seven (7). (Note: For essentially comparable volumes of processed gas, with CO₂ removed. Transporting 12-13% CO₂ would be expensive and inefficient.)
 - Fifteen (15) miles of major water crossings (Cook Inlet), a technically feasible but extremely difficult and expensive undertaking.
 - No apparent allowance for mitigating environmental problems, especially south of Livengood--national park, wetlands traversed, etc.

1/ The Alaska segment of ANCTS and TAGS are roughly comparable in terms of net gas delivery capability, after CO₂ removal, of about 2.5 bcfd, notwithstanding the fact that ANCTS has been limited by the State to an initial delivery rate of 2.0 bcfd. It should be noted that facilities comprising about one third of the total ANCTS system, including segments in Canada and the lower-48 States, have already been successfully financed and placed into operation.

- No evidence of any coping with frost heave problems--a major undertaking for NWA over past five years.
 - Inadequate consideration of need for heavy wall pipe within highway and railroad rights-of-way.
 - No apparent allowance for data acquisition (e.g., surveying, environmental, borehole drilling, soils testing), adequate refrigeration to cover gas temperature fluctuations, and temporary construction facilities. The latter item alone accounted for 15% of the NWA cost estimate.
- TAGS conditioning facility at \$1.4 billion is grossly underestimated in comparison to \$4 billion for ANGTS, even taking into consideration a premium for North Slope construction.
- Report assumes no capital costs for initial compression station on North Slope by use of existing producer reinjection compressors. This probably is unrealistic in light of past producer statements. Additional costs required would be about \$1 billion, according to the Hickel Report.
- In several places, a statement is made that "a liquids pipeline estimated to cost in excess of two billion dollars is eliminated." It should be noted that ANGTS does not require any such liquids pipeline. NGL liquids in ANCTS are shipped in the gas pipeline or in TAPS.

Inadequate Recognition of Technical and Scheduling Problems

- The report assumes only a two-year lead time before commencement of construction. This is grossly inadequate because:
- From Livengood South, the intended route has received no field testing or other engineering work, e.g., borehole drilling, soils testing, environmental studies, etc. Even to obtain government permits to conduct these preliminary activities is a time-consuming process. A massive amount of data will have to be acquired under adverse climatic conditions, and considerable additional time will be required for its analysis.
 - The report shows little concern for and misunderstanding of geotechnical/geothermal effects under Arctic and sub-Arctic conditions. For example, a

flawed understanding of the frost heave problem is exhibited by a pipeline routing into "thawed" floodplain soils north of and throughout the Brooks Range.

- Schedules in the report appear to have overlooked the time required for such items as: (1) establishment of West Coast fabrication sites, (2) bid cycles for equipment and major contracts, and (3) negotiation of a project labor agreement.
- Compressor stations were located by hydraulic analysis, without regard to environmental or construction considerations. For example, compressor stations are placed in Atigun Valley and adjacent to Mt. McKinley National Park, which may dramatically influence costs.
- A 36 inch diameter pipeline would severely restrict the capacity for potential future growth and would require very expensive looping in lieu of simply adding compression as planned for ANCTS to reach 3.4 bcfd. TAGS would be a poor choice in view of potential gas reserves on North Slope of 150 Tcf.

Environmental Matters Ignored.

- With major new routing, partly through virgin territory, a new environmental impact statement (EIS) would be required, taking at least two years.
- With ANCTS, 90% of environmentally sensitive areas are north of Fairbanks. TAGS would have all of the same problems plus major environmental issues to the south. Numerous highly sensitive areas would be traversed: national park and wilderness areas, wildlife preserves and refuges, and State parks.
- Significant air quality concerns exist with at least four compressor sites. (#4-Atigun Valley, no dispersion, #10 and #11 near Mt. McKinley National Park, Class No. I area, #14 Kenai National Wildlife Refuge).
- Tanker traffic control is problem in Cook Inlet--identified in early FPC hearings.

Financing

- TAGS has no buyers or project sponsors as does ANCTS.

- TAGS is built on a series of highly caveated gross assumptions and cannot be validly compared to ANGTs which has undergone detailed scrutiny in its cost estimate and other planning.
- A 20% contingency at this stage of development is unrealistically low.
- "Component financing" concept (breaking the project into smaller parts to ease financing) is totally useless unless the entire system is committed to in advance, which will be required by lenders.
- Assumption that State of Alaska tax-exempt bonds under Section 103 IRC might be used to finance liquefaction facilities is highly questionable.
- Congressional and regulatory actions and engineering, environmental, and legal studies to even begin development of a realistic financing plan would take a minimum of four years.
- Competitive proposals for supplying Japanese markets have not been assessed and evaluated vis-a-vis TAGS.
- The comment that "...it is generally necessary to secure contractual commitments for funds at least equal to the estimated cost of the project prior to the commencement of construction." is a gross simplification of the arduous task of securing even lender interest in the Project. Based on ANGTs experience, the project is at least 4 years from the point of engaging in serious discussion with lenders or perhaps even non-beneficiary investors.
- The alleged "flexibility" of TAGS is illusory. The project cannot be financed without firm long-term commitments in advance for purchase of the gas.
- The report itself recognizes that no assurances can be given with regard to project financing and "there remains significant uncertainties with respect to cost estimates and economic and financial assumptions in connection with the project of the scale of TAGS."

Legal

- The report emphasizes the possibility of avoiding FERC regulation (by not making any sales of gas in the U.S.) but ignores the fact that major federal and state agency involvement would be required for right-of-way, engineering

approvals, and construction authorization. Section 28 of the Mineral Leasing Act, the authority for federal pipeline rights-of-way, moreover, does not extend to national parks. Compliance with the manifold stipulations in government authorizations with respect to all aspects of project planning would be time-consuming and extend far beyond two years.

- While emphasizing the advantages of having the pipeline non-jurisdictional with FERC, the report also suggests the possibility of shipments to the U.S. These appear to be mutually exclusive. In any event the prospect of such a major transportation system being regarded as a "gathering line" is extremely unlikely.
- Congressional action would be required with respect to: (1) ANGTS, (2) concurrence in a federal right-of-way, and (3) potentially for any intrusion into the Mt. McKinley National Park.
- Land use problems may be seriously underestimated with respect to the Alaska Railroad and highway rights-of-way. 2/

Political

- Unlikely the U.S. will be willing to commit 26 Tcf of U.S. gas reserves to Japan, which would be necessary incident to the long-term contracts that are prerequisite to financing.
- The suggested desirability of substantial foreign financial participation could, moreover, raise questions concerning whether a Federal right-of-way should be granted. (See §2882.2-1(a) of Mineral Leasing Act regulations, 43 CFR 2880).
- Transporting unprocessed gas in the pipeline means that small local communities, slated for taps under ANGTS, would be unable to obtain gas without prohibitively expensive local processing.
- As a practical matter, even the report recognizes that a new Act of Congress or amendment to ANGTA will be necessary. Such action would require a minimum of one year.

2/ For the Alaska Railroad, refer to the Alaska Railroad Transfer Act of 1982 (Section 601 of Pub. L. 97-468).