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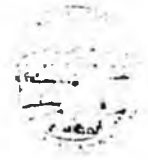
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HOUSE LABOR AND COMMERCE COMMITTEE

ALASKA STATE LEGISLATURE

P.O. BOX Y, JUNEAU 99811

(907) 465-3892



April 4, 1990

Letter of Intent
CS SS HB 454 (L&C)

It is the intent of the House Labor and Commerce Committee that the projects addressed in HB 454, along with all other projects which seek funding from the Railbelt Energy Fund, be addressed in the House Finance Committee. The House Labor and Commerce Committee neither affirms or denies support for the individual projects in HB 454 but seeks a forum where all the Railbelt projects can be heard as a collective package.

Representative Dave Donley, Chair
House Labor and Commerce Committee

dd/gbs90
b/hb454

DRAFT

HB454

D

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House Labor and Commerce Committee

dd/gbs90
b/hb454

6-1974J
Cramer
3/29/90

Funding Information: General Fund \$130,365,000
Other Funds -0-
\$130,365,000

Original sponsor(s): REP. KUBINA, Davidson

1 IN THE HOUSE BY THE LABOR & COMMERCE COMMITTEE
2 CS FOR SPONSOR SUBSTITUTE FOR HOUSE BILL NO. 454 (L&C)
3 IN THE LEGISLATURE OF THE STATE OF ALASKA
4 SIXTEENTH LEGISLATURE - SECOND SESSION
5 A BILL

6 For an Act entitled: "An Act making special appropriations from the Rail-
7 belt energy fund to the Alaska Energy Authority and
8 the Alaska Industrial Development and Export Authori-
9 ty for payment as grants and for design and construc-
10 tion of energy projects in Alaska; and providing for
11 an effective date."

12 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

13 * Section 1. FINDINGS AND INTENT. The legislature finds that the
14 Alaska Industrial Development and Export Authority has included the amount
15 of interest expected to be earned on the \$30,000,000 appropriated in sec. 5
16 of this Act when computing the financial feasibility of the Healy cogenera-
17 tion project. It is the intent of the legislature that the Department of
18 Revenue transfer the \$30,000,000 appropriated in sec. 5 of this Act to the
19 Alaska Industrial Development and Export Authority on July 1, 1990, or
20 immediately thereafter.

21 * Sec. 2. The sum of \$10,000,000 is appropriated from the Railbelt
22 energy fund (AS 37.05.520) in the general fund to the Alaska Energy Author-
23 ity for design and construction of the Seward intertie.

24 * Sec. 3. The sum of \$65,000,000 is appropriated from the Railbelt
25 energy fund (AS 37.05.520) in the general fund to the Alaska Energy Author-
26 ity for design and construction of the north portion of the Northeast
27 intertie.

28 * Sec. 4. The sum of \$365,000 is appropriated from the Railbelt energy
29 fund (AS 37.05.520) in the general fund to the Alaska Energy Authority for

1 payment as a grant under AS 37.05.316 to Chugach Electric Association for
 2 the Bean Creek subdivision and Blakley subdivision electric line in Cooper
 3 Landing.

4 ✓ * Sec. 5. The sum of \$30,000,000 and the interest earned on that sum
 5 beginning on July 1, 1990, are appropriated from the Healy cogeneration
 6 project reserve in the Railbelt energy fund (AS 37.05.530) in the general
 7 fund to the Alaska Industrial Development and Export Authority for the
 8 design and construction of the Healy cogeneration project.

9 * Sec. 6. The sum of \$25,000,000 is appropriated from the Railbelt
 10 energy fund (AS 37.05.520) in the general fund to the Alaska Energy Author-
 11 ity for placing underground the existing overhead electrical and other
 12 overhead utility facilities located in communities in the Railbelt.

13 * Sec. 7. The appropriations made by this Act are for capital projects
 14 and are subject to AS 37.25.020.

15 * Sec. 8. This Act takes effect July 1, 1990.
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6-1974H
Cramer
3/27/90

<u>Funding Information:</u>	General Fund \$105,365,000
	Other Funds -0-
	\$105,365,000

Original sponsor(s): REP. KUBINA, Davidson

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**HEALY
COGENERATION
PROJECT**

PROJECT HISTORY

1988
8861

* 150 MEGAWATT CONCEPT
-TECHNICAL EVALUATION

* MARKET ANALYSIS
-POWER & COAL

* 50 MEGAWATT CONCEPT
-PRELIM. FEASIBILITY

1989
8861

* PROJECT RESERVE BY
STATE LEGISLATURE

* PROPOSAL TO DOE

PROJECT PARTICIPANTS HEALY POWER PROJECT

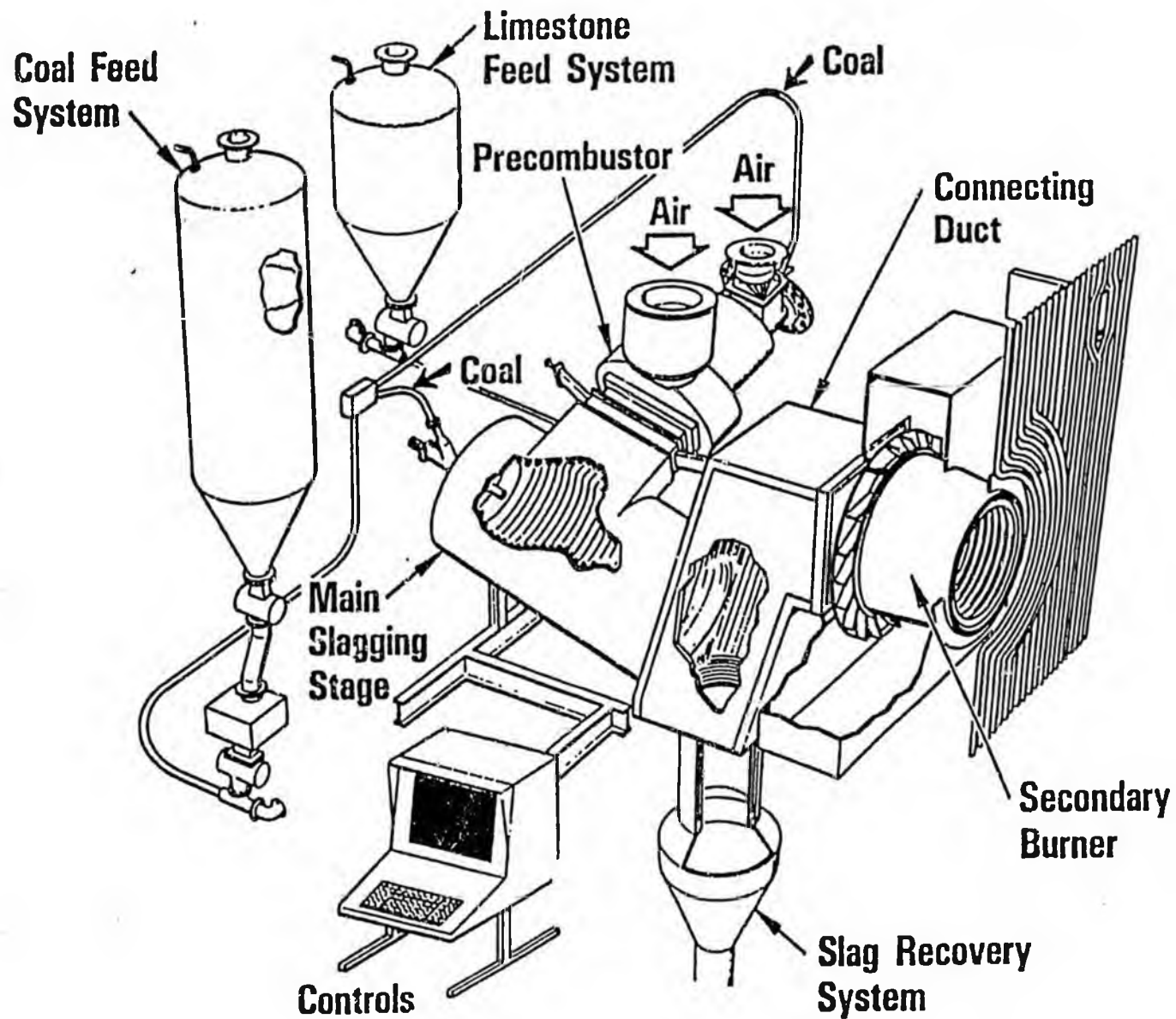
M0290113

- Alaska Industrial Development and Export Authority AIDEA
- Golden Valley Electric Association, Inc. GVEA
- Joy Technologies, Inc. and Niro Atomizer JOY
- Stone & Webster Engineering Corporation SWEC
- TRW Combustion Business Unit TRW
- Usibelli Coal Mine, Inc. UCM

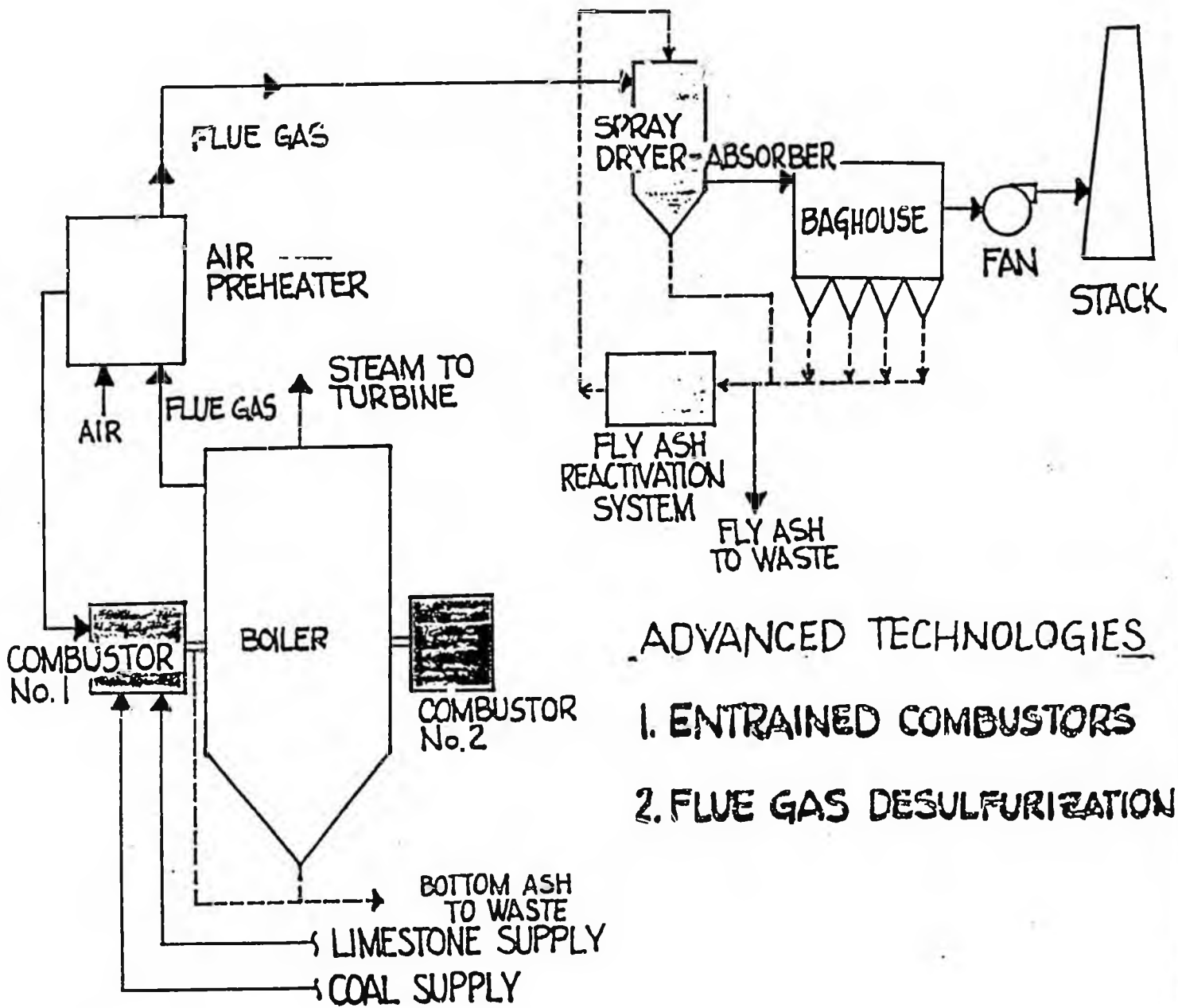
DOE CLEAN COAL III

OBJECTIVES

- * REDUCE ACID RAIN
PRECURSORS (SO_x & NO_x)
- * REDUCE U.S. - CANADA
AIR POLLUTION
- * COMMERCIALIZE CCT'S
 - RETROFIT
 - REPOWER
 - NEW COAL-BASED ELECT.
GENERATION



TRW ENTRAINED COMBUSTION SYSTEM
 Alaska Industrial Development and Export Authority



ADVANCED TECHNOLOGIES

1. ENTRAINED COMBUSTORS
2. FLUE GAS DESULFURIZATION

HCP BENEFITS

- * LOW COST, COAL-BASED POWER
- * CLEAN COAL TECHNOLOGY - LOW PLANT EMISSIONS
- * FUEL DIVERSIFICATION FOR POWER GENERATION
- * WASTE COAL UTILIZED
- * ENHANCED COAL EXPORT
- * USEFUL BYPRODUCTS

SOURCES OF FUNDS

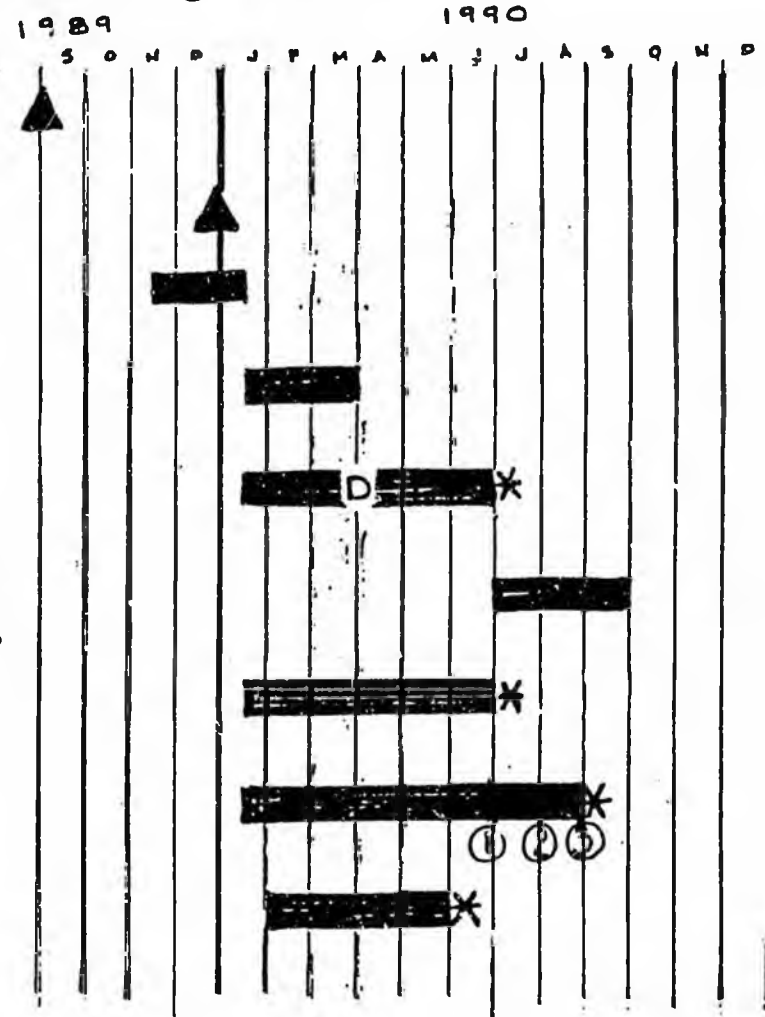
* CCT PROGRAM	\$ 93,186,000
* RAILBELT FUND	30,000,000
* AIDEA BONDS	<u>68,532,000</u>
	\$ 191,718,000

USES OF FUNDS

* DESIGN & PERMITS	\$ 26,721,000
* CONSTRUCTION	134,197,000
* DEMONSTRATION	<u>30,800,000</u>
	\$ 191,718,000

HCP NEAR-TERM SCHEDULE

DOE PROPOSAL
 DOE SELECTION
 FIN. CONSULT. SELECT.
 FINANCIAL PLAN
 POWER SALES AGMT.
 APUC REVIEW P.S. AGMT.
 COAL SALES AGMT.
 DOE COOP. AGMT.
 SECURE LEG. APPRN.



DOE COOP. AGMT.

① FINAL REPAYMENT PLAN

② HOST SITE AGREEMENT

③ DEMONSTRATE FINANCIAL CAPABILITY

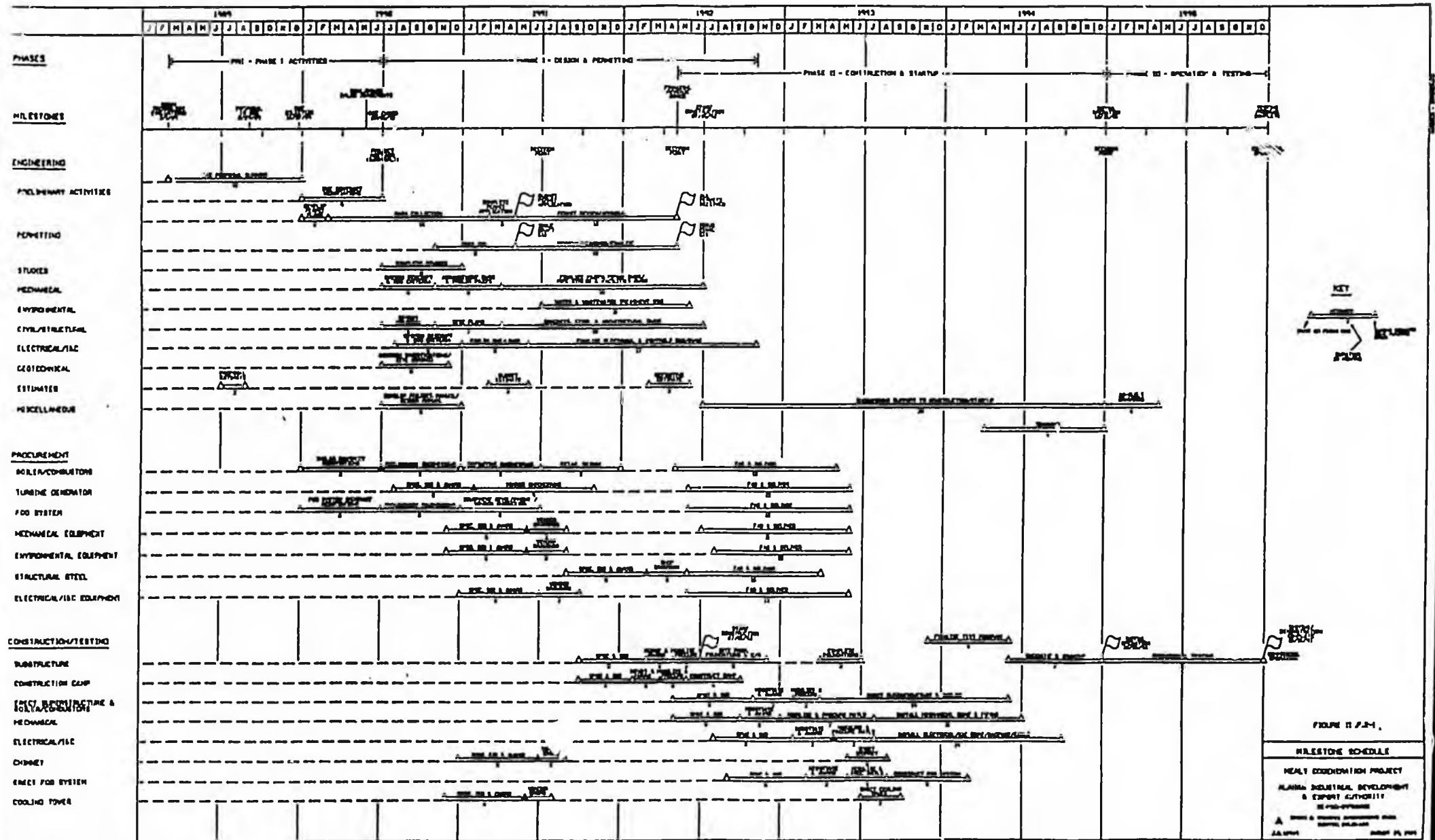
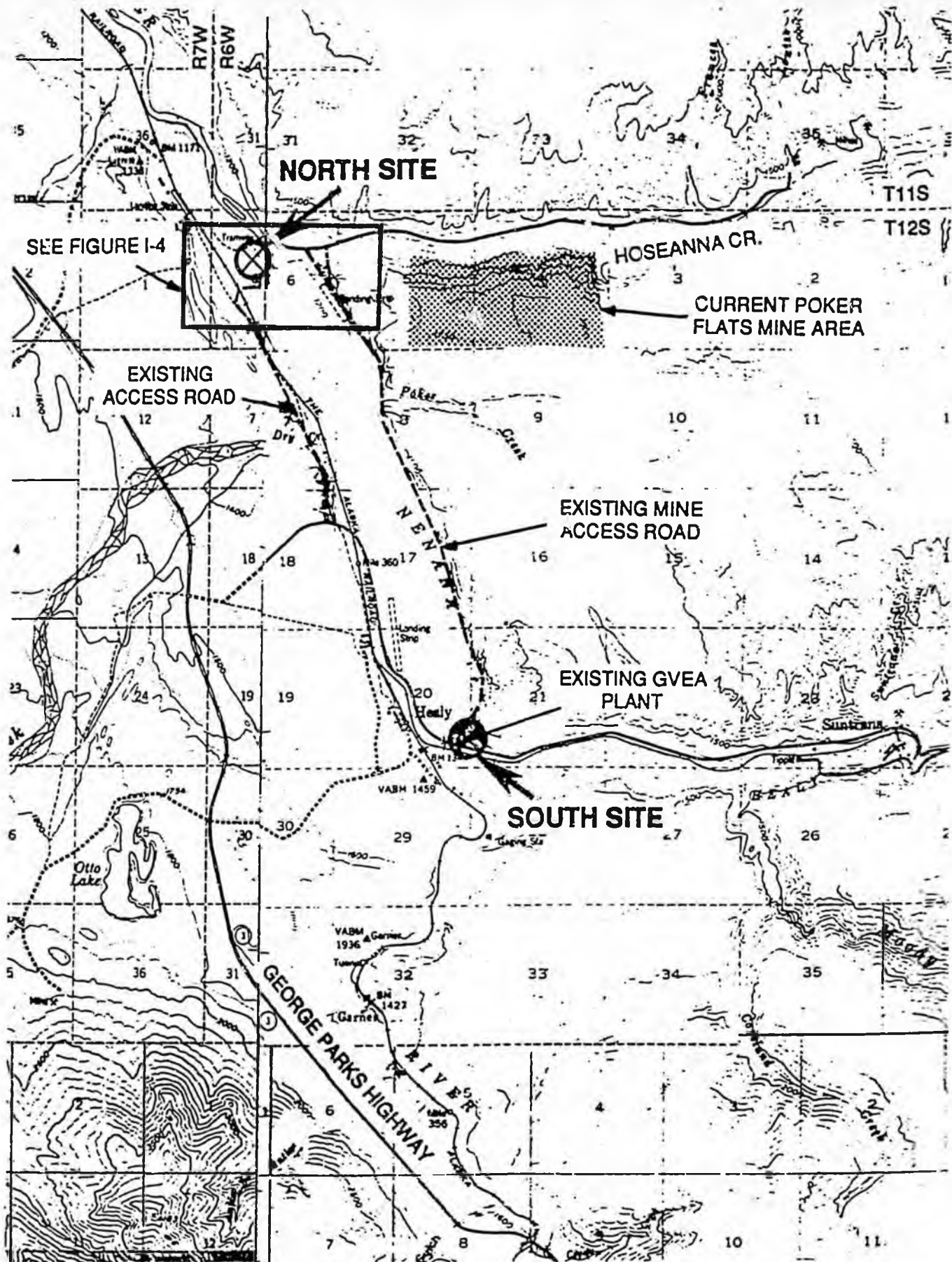


FIGURE 2.7-1

MILESTONE SCHEDULE
 HEAVY CONSTRUCTION PROJECT
 PLANNING, DESIGN, DEVELOPMENT & CONSTRUCTION
 BY THE PROJECT TEAM
 2000



PROJECT AREA
HEALY POWER PROJECT
 Alaska Industrial Development and Export Authority

CONSTRUCTION EMPLOYMENT

Mid - 1992 through 1994

\$134,197,000 Budget

Construction Employment - 200 Workers

OPERATIONAL EMPLOYMENT

GVEA/UCM - Power Generation

50 to 60 workers

UCM - Coal Beneficiation (Potential)

Additional Workers

A M E N D M E N T

OFFERED IN THE HOUSE

BY REP. BOYER

TO: SSHB 454

Page 1, line 7, after "Authority":

Insert "and the Alaska Industrial Development and Export Authority for payment as grants and"

Page 1, after line 10:

Insert a new bill section to read:

"* Section 1. FINDINGS AND INTENT. The legislature finds that the Alaska Industrial Development and Export Authority has included the amount of interest expected to be earned on the \$30,000,000 appropriated in sec. 5 of this Act when computing the financial feasibility of the Healy cogeneration project. It is the intent of the legislature that the Department of Revenue transfer the \$30,000,000 appropriated in sec. 5 of this Act to the Alaska Industrial Development and Export Authority on July 1, 1990, or immediately thereafter."

Page 1, line 11:

Delete "Section 1"

Insert "Sec. 2"

Renumber the following bill sections accordingly.

Page 1, after line 22:

Insert a new bill section to read:

"* Sec. 5. The sum of \$30,000,000 and the interest earned on that sum beginning on July 1, 1990, are appropriated from the Healy cogeneration project reserve in the Railbelt energy fund (AS 37.05.530) in the general fund to the Alaska Industrial Development and Export Authority for the design and construction of the Healy cogeneration project."

Renumber the remaining bill sections accordingly.

Adjust the funding information accordingly.

Alaska State Legislature

While in Session
P.O. Box V
State Capitol
Juneau, Alaska 99811
465-4859

P. O. Box 2463
Valdez, Alaska 99666
835-2695

Representative Eugene Kubina

MEMORANDUM

TO: Representative Dave Donley, Chair
Labor and Commerce Committee

FROM: Representative Gene Kubina *Gene*

RE: HB 454

DATE: February 1, 1990

I would like to request that HB 454; "An Act making special appropriations from the Railbelt energy fund to the Alaska Energy Authority for design and construction of energy projects in Alaska; and providing for an effective date", be scheduled in your Committee in the near future.

Thank you for your consideration of my request.

— DISTRICT SIX —

• Chenega Bay • Chitina • Cooper Landing • Cordova • Hope • Moose Pass • Seward • Tahtilek • Valdez • Whittier •



HOUSE BILL 454
Labor and Commerce Committee
The Honorable Dave Donley, Chairman

Testimony by: R.D. (Doug) Bursey
General Manager
Copper Valley Electric Association, Inc.

Thank you for the opportunity to provide testimony in support of House Bill 454. My name is Doug Bursey. I am the General Manager of Copper Valley Electric Association, Inc. with corporate offices in Valdez and Glenallen.

Copper Valley Electric Association, Inc., (CVEA) provides service to 1,510 consumers in Valdez and 1,052 in the Copper Basin area. The Valdez system is a compact urban area. The Copper Basin area is a quite sparsely settled rural area. The residential electrical rate for Valdez is 16.2 cents per Kwh, and the Copper Basin cost is 20.2 cents per Kwh.

CVEA was a participant in the Old Power Cost Assistance (PCA) program, however, CVEA has not participated in the Power Cost Equalization (PCE) program, even though CVEA's rates are the highest (after PCE adjustment) in the State of Alaska. CVEA does participate in the Four Dam Pool through Solomon Gulch.

Solomon Gulch is under utilized in the summer months, which allows water to spill which if utilized could double the summer output. The Solomon Lake storage area is rather small, and accordingly CVEA's generation strategy is to maximize this limited resource. This strategy requires tandem operations of Solomon Gulch, along with CVEA owned diesel generation facilities for approximately 6 months each year.

Therein lies part of the cause for CVEA high rates. CVEA generates 80% (eighty percent) of its needs from hydro, but has to maintain staff and operate sufficient oil fired generation to carry all of its electrical generation throughout the year. This major cost could be avoided, if CVEA were interconnected to another source through a tieline.

Unless a tieline is built within the next two to three years, CVEA will have to replace aged generation machines which will cause the existing high rates to go even higher.

Economic feasibility assessment of the CVEA system shows that, as the rates increase, end use has been reduced, which of course is normal. However, with rates in the twenty cent (20¢) range and expected to go higher, one has to look at the

quality of life. We also looked at economic development opportunities, and have found very little to encourage economic growth. We, therefore, began to look at what we could do to reduce, not raise, the rates.

The Alaska Energy Authority included CVEA in the economic feasibility studies performed on various transmission lines, by Decision Focus Incorporated and Powers Engineering with completion in June 1989. One of the transmission routes studied was called the Northeast Intertie. While none of the transmission lines had a perfect Benefit to Cost ratio, the Northeast Intertie had a very good showing and with minor changes, would become a valuable part of Alaska's infrastructure at a beneficial cost to Alaska and very definite positive affect on the Copper Valley system. (Appendix C)

The cost of electricity could be reduced rather than raised. Another major benefit could be to provide central station service to Black Rapids Cold Weather training facility, Summit, Paxson, Alyeska Pump Station 10 and other miscellaneous electrical loads along the Richardson Highway.

The Northeast Intertie, would also be a major part of load transfer and provide alternate service needs for Fairbanks. This is supported by the North American Electric Reliability Council Study (NERC), draft final report. (Appendix A)

I am told by Penny Haldane of the Alaska Energy Authority, that the statement found in Paragraph 1 page 4, last sentence "or more likely some other separate Right of Way transmission path.....", will change to read "other separate path such as the route identified as the Northeast Intertie route...." Also, the map found on Page 12, will show the penciled in Northeast Intertie, as I have penciled it in and highlighted it. (Appendix A)

The State of Alaska would benefit not only through economic development opportunities, but through a better use of Solomon Gulch. As I noted before, nearly as much energy spills over the dam each year as is used. A tieline would afford the ability to use this spill water and in the process make \$750,000 to \$1 million for the State through the Four Dam Pool debt service. This would be in addition to the \$1.5 million already returned annually by CVEA consumers. (Appendix D)

CVEA proposed that the tieline be constructed in two phases. Phase one from Delta to Glennallen would tie the State owned Solomon Gulch line at the Alyeska Station 11 to the Golden Valley Electric system at Jarvis Creek, a substation near Delta. Golden Valley Electric supports this effort.
(Appendix B)

This provides a win-win situation wherein everyone benefits;

- * Copper Valley Electric consumers have lower energy costs, the ability to participate in economic sales of electricity, and future stability of rates and power.

- * State of Alaska has additional income of approximately \$750,000 each year the project operates.

- * More area of the State is opened up to economic development, along with central station service being provided to Paxson, Summit, Black Rapid Military installation, and Pump Station 10.

Phase one needs to be built within two years. Phase two could be completed from Glennallen to Palmer within five years. When this leg is completed, a much greater benefit accrues in that Fairbanks utilities will have two sources to draw from, thus providing more stability. A different weather area exists on the Northeast Intertie route, which would reduce the impact of icing, windstorm or avalanche on the line along the Parks Highway, thus improving electrical service. This also provides for 125 MW of load transfer capability, as compared to the existing 70 MW, along the Parks Highway route.

CVEA's present costs for generation of oil fired generation is approximately twenty nine (29¢) cents per Kwh, as compared to power from Golden Valley Electric Association (GVEA) at Jarvis Creek at approximately three (3¢) or four (4¢) cents. If CVEA were interconnected, approximately 12,000,000 diesel fired Kwh's could be displaced at a direct cost savings of approximately \$2,000,000 annually. This savings would yield a rate reduction for CVEA consumers of three (3) to five (5) cents per Kwh.

Phase two will provide to the Railbelt utilities, especially the Fairbanks utilities, several benefits associated with an integrated system.

* High-Cost Power Displacement

An improved transmission system would allow energy produced as low cost in one area to displace high-cost generation produced in another area. This economy interchange between Anchorage and Fairbanks is limited by the capacity of the existing fully loaded transmission line.

* System Reliability

Improvement to the transmission system can reduce the number and extent of power outages, especially between Anchorage and Fairbanks which will reduce outages that have occurred due to the intertie along Park's Highway.

* System Efficiency

Power transfers between Anchorage and Fairbanks presently suffer losses exceeding ten percent. A second line will lower losses and reduce end user replacement costs.

* Reserve Sharing

With an improved, reliable transmission system in place, electric utilities could reduce the amount of costly reserve capacity they maintain. They could rely instead on reserves available elsewhere in the interconnected system.

Flexibility for new generation;

Should the Usibelli power plant be completed or other generation be proposed in the area, two lines will allow more flexibility, both in siting as well as sizing.

* Access to Bradley Power

An improved transmission system would ensure that all Railbelt electric utilities have freer and more direct access to the full peaking output of Bradley power, resulting in equal distribution of benefits from the project for all Railbelt communities.

* Utility Coordination

Strengthening the transmission system in the Railbelt would afford electric utilities increased opportunity to better coordinate their planning and operations.

House Bill 454
March 19, 1990
Page 5

* Fuel Supply

Improvements to the Railbelt transmission system would provide electric utilities with full access to a variety of energy sources, enhancing competition among fuels and fuel suppliers and would reduce the dependence on oil prices.

In summary, there are many compelling reasons to build the Northeast Intertie, n # to include, creation of economic development, Bradley Lake marketing opportunities, generation of additional Four Dam Pool revenues, increased reliability and transfer capability of the Railbelt energy grid and rate relief for interior and Gulf Coast communities.

Given the States energy policy to best serve all Alaskans, CVEA feels the Northeast Intertie makes the best sense as an investment.

We urge your support for House Bill 454.

APPENDIX

- A. NERC - Draft Final Report
- B. GVEA Support - Mike Kelly
- C. Supplement to DFI Report
- D. Solomon Gulch Spill Water (CVEA Letter)
- E. CVEA Kwh Sales and Rates
- F. CVEA Total Generation
- G. Railbelt Map

**DRAFT
FINAL REPORT**

**RELIABILITY ASSESSMENT
OF THE
RAILBELT INTERCONNECTED ELECTRIC UTILITY SYSTEMS
OF THE
ALASKA SYSTEMS COORDINATING COUNCIL
1990-1999**

March 16, 1990

by

a Subgroup of

NERC's 1990 Reliability Assessment Subcommittee

John H. Stout, Chairman
(Manager of Engineering Design and Development
Houston Lighting & Power Company)

Chris H. Fleming, Vice Chairman
(Manager, Advanced Engineering and Planning
Ohio Edison Company)

Richard E. Phillips, Operating Committee Representative
(Operating Manager
New York Power Pool)

Virginia C. Sutzberger, NERC Staff Coordinator
(Director-Engineering
North American Electric Reliability Council)

Preface

A subgroup of NERC's 1990 Reliability Assessment Subcommittee (RAS) recently reviewed the overall reliability of the Railbelt interconnected electric utility systems of the Alaska Systems Coordinating Council (ASCC) at the request of ASCC. This assessment reviewed the adequacy of the existing system and the proposed generation and transmission plans for the Railbelt electric systems over the 1990-1999 period. Included in this review were the reliability impacts of two proposed transmission interconnections — a Soldotna to University 138 kV line and a Healy to Fort Wainright 138 kV line (possibly 230 kV or 345 kV construction).

This assessment was performed over an approximate eight week period from mid January to mid March 1990.

In preparing this report, the RAS subgroup interviewed representatives of the Alaska Energy Authority, Anchorage Municipal Light & Power, Chugach Electric Association, Golden Valley Electric Association, and Fairbanks Municipal Utilities System. These interviews were conducted February 12-14, 1990 in Anchorage, Alaska.

In addition to the interviews, the assessment is based primarily on electric utility data and plans for 1990-1999 provided by the Railbelt interconnected systems on a basis consistent with the annual April 1 Coordinated Bulk Power Supply Program (IE-411) Reports submitted to the U.S. Department of Energy by each of NERC's nine Regional Reliability Councils and from the completion of additional annual data submittals generally requested by the Reliability Assessment Subcommittee from the nine Regions. Several reports of others, either prepared by outside consultants for the Railbelt electric systems or prepared by individual Railbelt electric systems, were also reviewed and provided background information.

This reliability assessment report is the culmination of these efforts and reflects the expertise, judgement, and interpretations of the RAS subgroup.

Reliability Assessment
of the
Railbelt Interconnected Electric Utility Systems

Overview

The Alaska Railbelt electric utility systems began interconnected operations just four years ago by linking together the Fairbanks area, the Anchorage Bowl, and the Kenai Peninsula. The unique geographic, economic, and electrical characteristics of the electrical systems in these three areas have resulted in a connection that is far less reliable than the four major electric interconnections of the U.S. American Electric Reliability Council (NERC). For example, the relatively small electrical size of the Railbelt interconnection and the relatively slow response time of the electrical generators require that automatic shedding of customer load take place following most generation and Railbelt interconnection transmission line contingencies. Nonetheless, this Railbelt interconnection has improved the reliability of electric supply to utility customers, primarily in the Anchorage Bowl area.

Two important reliability issues face the Alaska Railbelt interconnected systems. First is the need for additional transmission interconnection lines between the three major load centers and their generation facilities. The existing area interconnection lines are single, limited capacity lines prone to outage by weather and avalanche. Second, is the need to maintain a proper balance between economy and reliability. The cost of reliability is exceptionally high for the Railbelt systems resulting in compromises to the generally accepted electric utility reliability criteria in the lower 48 states and most of Canada. The expectations of the Alaska Railbelt customers toward reliable electric supply show signs of increasing. As a result, the interconnected Railbelt's seven members are recognizing that, along with sharing the economic benefits of interconnection operation, they must also share the responsibilities of reliability.

Assessment of the 1990-1999 generation adequacy clearly indicated that sufficient generating capacity margins exist in each of the three major load areas: the Fairbanks area, the Anchorage Bowl, and the Kenai Peninsula. Neither forced outages or maintenance outages are expected to adversely impact generating reserve adequacy. These three areas all have capacity margins well above the interconnection agreement requirement of 30% generating reserves. As electric demand within the Railbelt systems increases, the member systems should recognize that these margins will likely move down toward the 30% minimum. Of concern is the fact that the 30% reserve criteria is not founded on technical reliability studies such as loss of load probability analyses. The Alaska Railbelt systems should reassess carefully the justification of a 30% criteria and revise their interconnection agreement in accordance with such a reassessment.

The existing single line transmission interconnections between the Kenai Peninsula and the Anchorage Bowl and between the Anchorage Bowl and the Fairbanks area constrain the sharing of generation between and among load centers and pose a significantly higher than traditional reliability risk for system-wide blackouts due to single contingency outages.

In terms of traditional reliability criteria, the proposed Soldotna-University 138 kV transmission line provides a second circuit between the Kenai peninsula and the Anchorage Bowl and is necessary to help improve the reliability of electric supply to the Kenai peninsula, the Anchorage Bowl, and the Fairbanks area. This line will increase the electric transfer capability between the Kenai peninsula and the Anchorage area, improve system stability, and help to reduce the number of load shedding incidents in the Anchorage and Fairbanks areas and the black out or loss of electric supply to Kenai peninsula customers following certain system outages or contingencies. It will also help to reliably distribute the output of the Bradley Lake hydro generating facility to the appropriate utility purchasers of the hydro capacity. Without this line, reliability in the Kenai peninsula will likely be reduced following the completion of the Bradley Lake project.

The proposed Healy-Fort Walnwrights 138 kV (possibly 230 kV or 345 kV construction) transmission line is needed for the reliability of electric supply to the Fairbanks area. It provides a second transmission path from Healy to the Fairbanks area for both Healy generation capacity and capacity purchases from the Anchorage area (and the Kenai peninsula). This line provides both improved reliability and economic benefits (Bradley Lake capacity) to the Fairbanks area. Its reliability impact, however, will not be as dramatic as the Soldotna-University 138 kV line, but based on traditional planning criteria, the tie is required to assure an adequate source-to-load path from Healy to the Fairbanks area. In fact, under traditional reliability criteria, a second transmission line between the Anchorage Bowl and the Fairbanks area would likely be required (either via Teeland and Healy, or more likely some other separate right-of-way transmission path between the Anchorage Bowl and the Fairbanks area).

Finally, as the existing Railbelt systems lack individual comprehensive planning and operating criteria as well as interconnection criteria for integrated planning and operations, the Railbelt utilities should develop, formulate in writing, and approve appropriate planning and operating reliability criteria for their respective systems and service areas as well as for interconnected planning and operations.

Peak Demand and Generation Adequacy

The assessment of the Alaska Railbelt systems generation adequacy should not be made solely on an aggregate interconnection basis. This is because the transmission interconnections between the three major load centers: the Fairbanks area, the Anchorage Bowl, and the Kenai Peninsula consist of single, limited capacity transmission lines. As such, these interconnection lines constrain the sharing of generation between load centers. A proper assessment of generation adequacy requires that the Fairbanks (Golden Valley-Fairbanks) area, the Anchorage Bowl, and Kenai Peninsula be evaluated individually.

The distribution of installed generating capacity among the three geographical regions of the Railbelt electric utilities is generally proportional to the load distribution as shown in Table 1. About 63% of the winter peak demand of the Railbelt is located in the Anchorage Bowl area, 22% in the Fairbanks area, and 15% in the Kenai Peninsula. Similarly, the installed generating capacity is 67% in the Anchorage Bowl, 20% in the Fairbanks area, and 13% on the Kenai Peninsula. The small mismatch is not significant as all areas have capacity margins of 30% or more in the early years of the assessment period.

With the addition of Bradley Lake hydro plant in 1991 at the southern extremity of the Kenai Peninsula in 1991, along with some planned retirements and replacements of capacity, the ratio of installed capacity by the winter of 1999/2000 will shift slightly resulting in about 61% in the Anchorage Bowl, 20% in the Fairbanks area, and nearly 19% on Kenai. The capacity margins will continue to be adequate in the three load areas and are projected to range from 38% to 54% at the end of the assessment period.

The makeup of the generating capacity and the relative economics of operating the various types of capacity in the three areas distort the apparent balance of generating resources and demand requirements. As shown in Figure 2, about 92% of the 1989/1990 installed capacity is primarily gas- or oil-fired with only about 4% consisting of coal-fired steam turbines (with all 45 MW of that located in the Fairbanks area) and the remainder about 4% hydro. About 32 MW of the 49.2 MW of hydro capacity is located in the Anchorage Bowl with the remaining hydro on the Kenai Peninsula. With the addition of Bradley Lake hydro plant (and other generating capacity replacements and retirements through 1999), the proportion of hydro will shift to nearly 13% with 125 MW of the 157 MW being concentrated on the Kenai Peninsula.

Due to relative fuel costs, the Fairbanks area relies primarily on its coal-fired steam generation and significant imports from the south. That is, depending on the time of the year, some 50% or more of its electrical energy requirements are imported over the single 170 mile line from the Anchorage Bowl area. These imports plus the output of the 25 MW coal-fired steam turbine at Healy, in turn, depend upon the single 103 mile line to Gold Hill substation to reach the Fairbanks area customers.

Similarly, except for a small amount of hydro, there is limited generation normally operated on the Kenai Peninsula, and the 89 mile transmission interconnection line with the Anchorage Bowl is relied on for imports approaching 60% of the load requirements of the Kenai area. However, after the completion of the Bradley Lake 108 MW hydro plant, that import situation will change. The Kenai Peninsula will become a net exporter of capacity entitlements to the systems north of the peninsula via the Anchorage Bowl during most of the year over that same single 89 mile interconnection line.

In the Anchorage Bowl area today, the electrical generation output is generally equal to twice the customer requirements in the area, or more. Net exports from the Bowl therefore equal or exceed the Bowl area demand. Nearly one-half of the generation in the Anchorage Bowl is located at Beluga generating facility at the western extremity of the Bowl on the western shore of Cook Inlet. This is also the most economical generation with the exception of the 32 MW of hydro at Eklutna near Palmer. The output of Beluga and Eklutna along with some generation in downtown Anchorage are relied upon heavily to support both the Anchorage Bowl load and the exports to the Fairbanks area and the Kenai Peninsula. This result is a mix of generation of some 80% or more of the total operating capacity in the Railbelt interconnection concentrated in the Anchorage Bowl, 10 to 15% in the Fairbanks area, and 5% or so in the Kenai Peninsula.

After the addition of Bradley Lake in 1991, it appears that the typical operating generation mix would shift to approximately 65 to 70% in the Anchorage Bowl, 20% in the Kenai Peninsula, with the Fairbanks area retaining its 10% to 15% share.

Sufficient generating capacity exists in the three major Railbelt electric areas for normal and emergency operation. However, the economic realities of the cost of operating that generation results in a preponderance of the electrical energy requirements of the Railbelt interconnection being generated in the Anchorage Bowl area. The Fairbanks and Kenai areas rely heavily on imports of that generation to supply their electrical requirements. Therefore, the transmission interconnection transfer capability and its reliability both north and south of the Bowl are critical. Although the addition of the Bradley Lake hydro plant will somewhat reduce the generation requirements in the Anchorage Bowl area and would result in Kenai Peninsula being a net exporter much of the time, the same transmission interconnection between Anchorage and the Kenai Peninsula would be relied upon to maintain that supply and the capability and reliability of the north and south transmission interconnection lines would continue to be important.

Assessment of generation adequacy clearly indicates that sufficient generating capacity margins exist in each of the three Alaska Railbelt areas. Neither forced outages or maintenance outages are expected to adversely impact generating reserve adequacy. However, while the individual utilities or areas may have capacity margins well above the interconnection agreement requirement of 30% reserves, the Railbelt member systems should recognize that as demand increases the margins will likely move down toward the 30% minimum. Of concern is the fact that the 30% criteria is not founded on technical reliability studies such as loss of load probability analyses. The Alaska Railbelt systems should reassess carefully the justification of a 30% criteria and revise their interconnection agreement in accordance with such a reassessment.

Transmission Adequacy

As the loads and generating capacity of the Railbelt electric systems are generally in three geographically separate areas, each of the areas had developed its own transmission systems prior to establishing interconnected operation in the mid 1980s. As a consequence, there are three transmission voltages in use that are interconnected by transformation at five substations in the Anchorage Bowl area as shown in Figure 1. In addition, there is underlying subtransmission in each of the areas consisting primarily of 69 kV facilities as well as some 34.5 kV.

In the Golden Valley area, which encompasses Fairbanks and extends from Denali Park up the Tanana River valley past Fairbanks to Delta Junction, the transmission system is a single 138 kV circuit of approximately 212 miles in length, except for a 33 mile section between the North Pole and Carney substations currently bridged by 69 kV facilities. However, there are plans to add a 138 kV segment to complete this system in 1994. The Fairbanks area (Golden Valley and Fairbanks) is interconnected with the Anchorage Bowl area by 170 miles of single circuit line between the Healy generating plant near Denali Park to Teeland substation. Teeland substation is an interconnection point for all three transmission voltages of these systems and is located in the northwestern portion of the Anchorage Bowl area.

The Kenai Peninsula is the southernmost of the three areas and has a transmission system of 115 kV which is essentially a single circuit serving the peninsula with branches to Fritz Creek, Lawing, and Bernice Lake. Approximately 180 miles of 115 kV transmission line serves the Kenai Peninsula. Future plans are to convert 24 miles of 69 kV line between Lawing to 115 kV thereby extending the 115 kV branch to Seward. The Kenai Peninsula is interconnected with the Anchorage Bowl by a 89 mile 115 kV circuit between Quartz Creek substation (41 miles north of Seward) and University substation. University substation is another interconnection point for three transmission voltages and is located in the southeastern portion of the Anchorage Bowl area.

The Anchorage Bowl area includes the city of Anchorage and the surrounding countryside between the Turnagain and Knik Arms of Cook Inlet, extending northward to Palmer and the Matanuska Valley area, and westward to the area north and west of the Knik Arm. The transmission system within Anchorage is 115 kV with an extension southward to the three voltage University substation and one north to Palmer and westward to the Teeland substation interconnection point. In addition, there is an overlay of about 98 miles of 230 kV transmission extending from Beluga generating station on the west shore of Cook Inlet to a 230/138 kV stepdown substation at Point MacKenzie, then north to the Teeland substation interconnection point as well as eastward from Point MacKenzie across Knik Arm (via subtransmission) to Anchorage where it is interconnected to the 115 kV system, and then south to University substation with another transformation to 115 kV. The 230 kV loop is closed by 138 kV, transformed from 115 kV at University substation, along the southern boundaries of Anchorage to Point MacKenzie stepdown substation and extended west to the Beluga generating plant.

The transmission in the Anchorage Bowl area is such that it can be considered a network and, as such, should be able to withstand loss of any given circuit. The Kenai Peninsula is essentially a branched circuit with underlying subtransmission on the cross-peninsula sections, such that loss of any branch should be sustainable with only loss of the area served by that branch. However, the 89 mile single circuit tie between Kenai Peninsula and the Anchorage Bowl is, and has historically been, subject to outages due in large part to avalanches. These outages place the Kenai Peninsula in jeopardy from the effects of isolation from the Anchorage Bowl. The addition of the 108 MW Bradley Lake hydroelectric plant at the southern extremity of the peninsula near Homer along with 60 miles of 115 kV transmission between Fritz Creek and Soldotna will tend to exacerbate this situation with the further problem that loss of the

existing Kenai-Anchorage Bowl interconnection would interrupt Bradley Lake capacity entitlements of the Anchorage Bowl and Fairbanks area utilities.

The addition of the proposed 138 kV circuit between Soldotna substation, requiring transformation from 115 kV at that point, to the 138 kV portion of University substation would not only provide a parallel path to the existing tie but would also make the Kenai electric system more of a loop arrangement. It is in view of this that the following comments are offered as regard reliability aspects:

- The existing 115 kV interconnection line has a poor reliability history and has a transmission transfer capacity limit under 75 megawatts (MW). The chances of significantly improved performance is not great due to its physical/geographical location and system conditions that exist.
- The second (currently proposed Soldotna to University 138 kV line) Kenai interconnection to the Anchorage Bowl area would improve reliability by preventing the shedding of customer load if the existing interconnection line trips, (with the possible exception of those times when the Kenai Peninsula generation is operating in anticipation of loss of the existing tie).
- When Bradley Lake comes into service, reliability will suffer without a second interconnection tie. That is, the second Kenai Peninsula to Anchorage Bowl line is necessary to support Bradley Lake and to help reliably distribute the Bradley Lake capacity to the purchasing systems, to minimize blackouts in the Kenai Peninsula, and to minimize underfrequency load shedding in the Fairbanks area and the Anchorage Bowl.

As indicated above, the Golden Valley-Fairbanks area transmission system is essentially a 212 mile single circuit from the primary electrical source at the Healy generating plant to the eastern extremities of the system at Jarvis Creek. Of this, only about 50 miles has underlying transmission and therefore this system is highly exposed for loss of any single 138 kV circuit segment, particularly the 103 mile circuit between Healy and Gold Hill. It is in view of this that the following comments are offered as regard reliability aspects.

- The addition of the proposed 105 mile 138 kV circuit between Healy generating plant and Fort Wainwright substation would not only provide an alternate path for loss of the circuit to Gold Hill, but would also provide essentially loop service between the Healy plant and the major part of the load in this area.
- The reliability of the Healy-Gold Hill line has been good, such that additional facilities will not have as dramatic an impact on reliability as the second Kenai Peninsula to Anchorage Bowl tie. However, based on traditional planning criteria, the Healy-Fort Wainwright tie is required to assure an adequate source-to-load path from the dual sources at Healy (Healy generation plus the capacity purchases from the Anchorage Bowl and Kenai Peninsula (Bradley Lake)) to the Fairbanks area.

The 170 mile interconnection line between Teeland substation and Healy generating plant is vulnerable to single circuit outage and would cause loss of transfer capability between the Anchorage Bowl area and Healy. Future consideration should be given to providing an additional transmission path between the Anchorage Bowl area and the Fairbanks area. Under traditional reliability criteria, a second transmission line between the Anchorage Bowl and the Fairbanks area would likely be required (either via Teeland and Healy, or more likely some other separate transmission path between the Anchorage Bowl and the Fairbanks area).

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Operations

The following comments are made concerning the operational aspects of the Alaska Railbelt interconnected systems:

- Each Railbelt system indicated it brings on additional generation for reserves in recognition of adverse weather conditions. These reserves were indicated to be geographically located such that they would not be bottled by transmission contingencies. This type of response enhances reliability and should be encouraged.
- It was indicated in the interviews that customer load would be shed if economy or non-firm transactions were interrupted. This does not conform to the traditional interpretation of NERC criteria for these types of transactions in the interconnected systems of the lower 48 states. The three traditional broad categories of electrical transactions and a summary of their application is as follows:

Economy – Economy transactions are, by definition, immediately withdrawable. Receiving systems have the obligation to maintain generation backed-off and spinning to replace the economy without loss of load.

Non-Firm or Interruptible – The receiving system must have generation available to replace the purchase within a specified time. The seller must maintain the delivery for the duration of the agreed upon time. Interruption of the transaction within the predetermined time frame is accomplished without any loss of load.

Firm – A firm purchase is treated as a generator on the receiving system and a load on the sellers system.

- Lack of agreement exists over who must cut what generation schedules if a transmission constraint exists. This condition is partially due to conflicting terms between new and existing contracts, e.g. contracts between Chugach and Fairbanks and contracts associated with Bradley Lake. There is also a lack of definition in the area of transmission ownership vs use. These are policy decisions that should not wait for shift dispatchers to solve when the condition occurs.
- Additional spinning generator reserves will not prevent underfrequency load shedding for the loss of generation. Reliance on load shedding as spinning reserve is not traditional and is avoided by most NERC systems. However, due to the unique nature of the Railbelt systems, their generation inertia and size of loads, this technique may not only be appropriate, but essential.
- Each Railbelt system should develop written operating criteria and procedures for its system. These criteria and procedures could then be compared and utilized to develop overall operating criteria and procedures for the Railbelt interconnection

Reliability Issues

The existing Railbelt utilities lack comprehensive planning and operating criteria as well as interconnection criteria for integrated planning and operations. Therefore, the existing and proposed Railbelt electric utility systems were evaluated against traditional reliability criteria and practices followed by the interconnected electric systems of NERC's Regional Reliability Councils in the lower 48 states and Canada.

For example, NERC's Planning Guides recommend to the extent practicable that an excessive concentration of generating capacity in one unit, at one location or in one area, be avoided, that excessive dependence on a single transmission line be avoided, and that a system be designed to withstand credible contingency situations. Under traditional criteria, a single generation or transmission contingency generally would not black out an entire interconnected system or cause the shedding of a portion of system load. In contrast, within the Alaska Railbelt systems, a single contingency such as the loss of fuel supply to the Beluga generating plant on December 11, 1989 can and has blacked out the interconnected Railbelt electric systems. Similarly, based on information given to the RAS subgroup, during periods of high capacity transfers from the Kenai Peninsula Bradley Lake project, the sudden outage of the existing 115 kV interconnection line between the Kenai peninsula and the Anchorage Bowl would likely cause load shedding in the Anchorage and Fairbanks areas and a blackout of the complete Kenai electric system. These two examples illustrate the lack of compliance with traditional NERC planning and operating criteria.

Based on a comparison of the current Railbelt interconnected systems planning and operating procedures with traditional electric utility planning and operating reliability criteria in NERC-U.S. and NERC-Canada, the RAS subgroup offers the following comments:

- **Planning and Operating Criteria** The Railbelt utilities should develop, formulate in writing, and approve appropriate planning and operating reliability criteria for their respective electric systems and service areas. In addition, coordinated interconnection planning and operating reliability criteria should similarly be developed, formulated in writing, and approved under the auspices of the existing Interconnection Agreement or under the ASCC umbrella. NERC's Planning Policies encourage the development of planning and design criteria by Regional Councils, power pools, and individual systems applicable to their Region or area.
- **Load Shedding and Spinning Reserve Studies** The Railbelt utilities are currently conducting two important reliability related studies. The first involves the application of underfrequency load shedding schemes. Underfrequency load shedding is critical to the Railbelt utilities, because it is the primary method of preventing system blackouts following a loss of generation or certain transmission line outages. The second study involves spinning reserve requirements after the Bradley Lake hydro project comes into service. This study will also play an important role in determining the ability of the Railbelt utilities to avoid uncontrolled loss of customer load following a system disturbance. Both studies are likely to result in Railbelt members having to make difficult decisions affecting the balance between economy and reliability. Interconnected operation will require that such decisions be made, and complied with, as one, rather than as seven separate systems. The importance of these studies dictates that they be completed promptly and that the Railbelt utilities quickly determine and implement whatever policy and procedures are identified by those studies.
- **Bradley Lake Hydro Project** The Bradley Lake hydro project, on the Kenai Peninsula, is nearing completion, but the Railbelt utilities have not yet received approval for construction of the transmission facilities needed to reliably transfer capacity from the project to major load centers. As discussed elsewhere in this

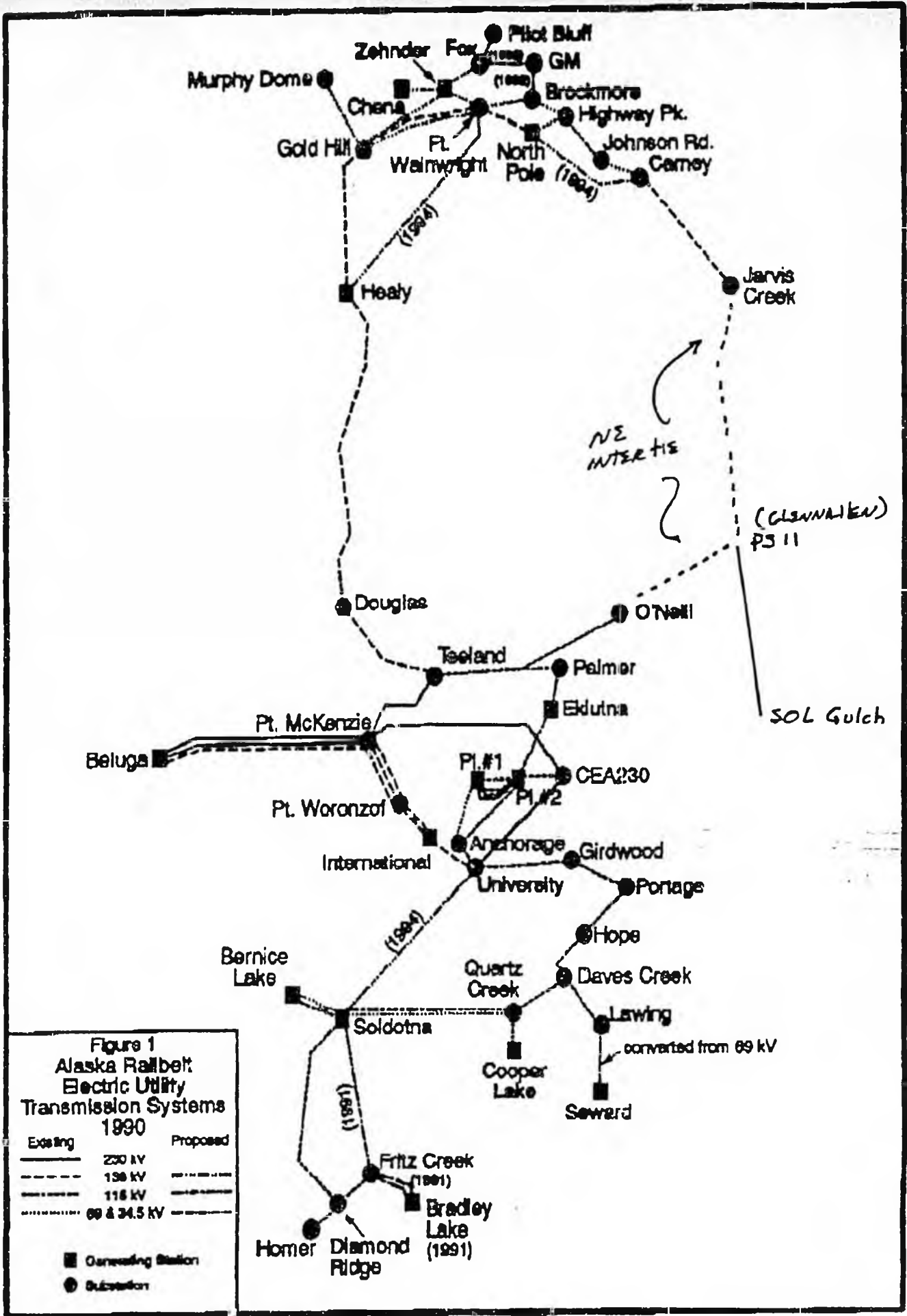
assessment, this is a direct threat to the reliability of the Railbelt systems. However, it is also an indication of an even greater threat, the lack of an integrated, coordinated process of planning transmission to accompany generation resources. Electric system reliability is much like a chain, with generation, transmission, and distribution facilities as individual links. Making the generation link stronger is ineffective unless the transmission link is at least as strong. In the future, the Railbelt utilities must proactively and collectively plan transmission to support any generation or purchased capacity options. Reliability will likely suffer if transmission requirements remain an afterthought.

- Economy vs Reliability The most significant issue affecting the reliability of the Railbelt utilities is maintaining a proper balance between economy and reliability. If judged against the reliability levels generally maintained by the NERC Interconnections, it would appear that, within the Railbelt utilities, economics has encroached on reliability. However, given the unique geographic, electrical, and economic circumstances facing the Railbelt systems, the existing balance may be proper. The cost of providing reliability is exceptionally high for the Railbelt utilities, but there are indications that the reliability expectations of the customers in the Railbelt utilities are increasing. The lack of a clear, written definition of what constitutes adequate reliability for the Railbelt utilities makes a final judgment impossible. However, one judgment that can be made is that more than in any other NERC Region, the balance between economy and reliability is of concern. The members of the Railbelt utilities must pay utmost attention to this balance. It is easy to share in the economic benefits of an interconnected system. It is more difficult, but nevertheless just as important, to also share the responsibilities of maintaining reliability.

Table 1
RAILBELT INTERCONNECTED ELECTRIC UTILITY SYSTEMS OF ASCC
PEAK DEMAND & CAPACITY RESOURCES — MW
Winter Season

Major Electric Load Centers	Utilities	1989/1990		1999/2000	
		<u>Demand</u>	<u>Capacity</u>	<u>Demand</u>	<u>Capacity</u>
Fairbanks Area	GVBA	100	197	122	221
	FMUS	<u>30</u>	<u>44</u>	<u>33</u>	<u>28.5</u>
	Total	139	241	155	249.5
Anchorage Bowl	CEA	163.8	413.8	170.0	383.9
	APAD	0	32	0	32
	MEA	97	0	113	0
	AML&P	<u>143</u>	<u>331.8</u>	<u>155</u>	<u>331.8</u>
	Total	403.8	777.6	438	747.7
Kenai Peninsula	CEA	13	99	13.3	63.7
	HEA	73.9	40	76.3	40
	SES	10.5	10.5	14	13.5
	AEA	<u>0</u>	<u>0</u>	<u>0</u>	<u>108</u>
	Total	97.4	149.5	103.6	225.2
All Systems	Total	640.2	1168.1	696.6	1222.4

Sources: Draft of the Railbelt interconnection's responses for the 1990-1999 period to the U.S. Department of Energy's annual April 1 Coordinated Bulk Power Supply Program (IE-411) Report and the NERC Reliability Assessment Subcommittee's data request forms 01 through 08.





GOLDEN VALLEY ELECTRIC ASSOCIATION INC. Box 71249, Fairbanks, Alaska 99707-1249, Phone 907-402-1151

March 20, 1990

Mr. Doug Bursey
Copper Valley Electric Association
P.O. Box 45
Glennallen, AK 99588

Dear Mr. Bursey,

Thank you for the copy of HB 454. I was pleased when Mr. Kubina replaced our friend Representative Cato when she retired. He has a head start on energy issues because of his experience on your Board. He can be very helpful in assuring that the energy fund is used for its intended purpose. I also believe he has the energy and vision to work toward interconnection of the Copper/Cordova area into the Railbelt grid. He knows how important it is for power cost in that area to be cut in half.

As we discussed at the ARECA meeting in Juneau last week, the primary goals for use of the energy fund remain as follows: (1) construction of the Kenai-Anchorage and Healy-Fairbanks interties; and (2) ongoing funding of PCE. However, as we have discussed, we need to be looking beyond these projects toward solutions to the power cost problems in your consumers' area. I'd like to play a role in implementing those solutions if possible.

The Northeast Intertie which was studied by AEA as a candidate for funding showed multiple millions of dollars in benefits to Southcentral, the Copper Basin and the Interior. If you believe as I do that our State will grow and prosper, this line must be built. In the lower 48 most major transmission ties are in place. They were funded during the past 50 years through a combination of federal programs for public power and generous tax breaks for the privates. All those opportunities are in the past. Alaska is a young state. Our state government must play the role of assisting our consumers in adding the important transmission infrastructure that will bring reliable, inexpensive power to our citizens. The Northeast Intertie is a worthy candidate-project.

The Northeast Intertie can be built in three stages. First, Delta Junction to Glennallen. Then Glennallen to Palmer; then later over to Cordova. The first leg from Delta to Glennallen has many immediate benefits. Among them are:

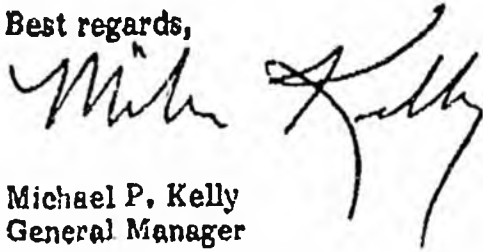
1. The high cost diesel generators would immediately be silenced.
2. Consumers could be connected at major points along the highway.
3. GVEA could purchase the "spilled KWHs" from Solomon during the summer when CVEA doesn't have enough load to absorb all the output.
4. Copper and Delta would benefit from the dual feed, thereby insuring reliability. The recently released NERC report points out the importance of the transmission ties.

Mr. Doug Bursey
March 20, 1980
Page 2

5. CVEA rates would plummet as a result of gas-fired energy from Anchorage and coal-fired power from the new Healy plant.
6. If CVEA is still interested, we could renew investigation of a CVEA-GVEA merger.

Doug, I'll help all I can.

Best regards,

A handwritten signature in cursive script that reads "Mike Kelly". The signature is written in dark ink and is positioned to the right of the typed name.

Michael P. Kelly
General Manager

**COPPER VALLEY ELECTRIC ASSOCIATION, INC.**

P O BOX 45 GLENNALLEN, ALASKA 99588-0045

Glennallen (907) 822-3211
Valdez (907) 835-4301
Telefax # (907) 822-5586

March 24, 1989

Mr. Salim Jabbour
Decision Focus Inc.
4984 El Camino Real
Los Altos, CA 94022

Subject: D.F.I. Report on Railbelt Intertie Feasibility Study

Dear Mr. Jabbour:

We appreciate the time spent in presenting the D.F.I. analysis during the meeting of March 13, 1989. Even though the schedule of the final report is rather inflexible, we must request that we are kept informed of the developing changes.

As discussed during the meeting, there are benefits associated with the Northeast Intertie that were not addressed in the model presented. The most significant benefit would be the costs associated with generation sharing between Golden Valley Electric and the other utilities. Since this savings is not possible with the alternate route, it seems an easily quantifiable and necessary benefit.

There has been discussion as to the merits of including the Backscatter load in the analysis. We feel that this load should not be down played and should realize full potential. Information we have indicates that the likely supplier is very interested in being connected to a power grid. This is certainly a good indication as to the merit of including the Backscatter load as truly viable.

We are concerned that the overall benefits to the CVEA system have been lessened due to questions concerning our system, specifically our system heat rate. CVEA operates its system in the most efficient manner possible, yet is limited by old and inefficient equipment. Assuming that our heat rate is any better than we reported is not supportable.

The model indicates additional generation being added with existing heat rates utilized. We feel that this is a conservative approach that should be followed. We have no way of forecasting the performance levels of future plant since the percentage of new generation versus use of existing is as yet undetermined.

SERVING MEMBER-OWNERS IN THE COPPER RIVER BASIN AND VALDEZ

(APPENDIX C)

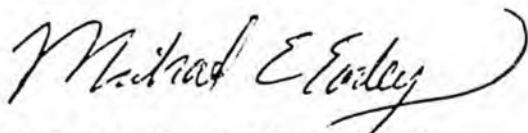
Page 1 of 3

Mr. Salim Jabbour
March 24, 1989
Page 2

As CVEA operates an isolated system, we feel very strongly about the Northeast Intertie. The overall effect on the quality of life to our members in Glennallen and Valdez stands to be greatly improved by this project. These benefits are not easily quantified, but must be considered. Currently, electricity is consumed on a purely subsistence level with absolute minimum use. The only way for this to change is for reductions in energy costs now exceeding 20 cents per Kwh, and the only way to lower these costs is for CVEA to become interconnected into the power grid through the Northeast Intertie. We hope that the importance of these issues will allow their incorporation into the final report even though the project completion draws near.

If we may provide any additional information which can be incorporated in the model, please let us know.

Sincerely,



Michael E. Easley, P.E.
Manager, Engineering Services

cc: Steve Haagenson, GVEA
Richard Emmerman, APA
Alan Mitchel, ISER

SUMMARY OF BENEFITS-RAILBELT INTERTIE FEASIBILITY

MARCH 15, 1989

PROJECT	EXPECTED		UTILITY		COST
	LOW	HIGH	LOW	HIGH	
ANC-FRENE 100MW	31.7	32.4	22.8	23.5	8.46
ANC-FRENE	-38.5		-6.8		133.9
N.E INTERTIE	-30	41.5	-3	112	186.1
COAL	-88.8	-168	-86	-166	290.7
GAS	191.2		271.9		284.1
GENA1-ANCH	-72.8	-61.5	-77.2	-65.9	103.1
ENDUSE 3	5.19	7.11	10.28	10.28	15.42
ENDUSE 8	1.51	5.95	14.38	14.38	43.51

ADDITIONAL BENEFITS TO BE ADDED TO NE INTERTIE SINCE ADDITIONAL TRANSMISSION RELIABILITY WILL ALLOW GVEA TO REDUCE GENERATION CAPACITY.

GAS OPTION SHOWS LARGE BENIFITS AT THE COST OF ENERGY DIVERSIFICATION MILITARY MAY NOT APPROVE SINGLE SOURCE PIPELINE.
GAS COMPANY PROFITS ARE INCLUDED IN BENEFITS.

OTH-B LOAD IS CONSIDERED IN HIGH VALUES FOR NE INTERTIE.



COPPER VALLEY ELECTRIC ASSOCIATION, INC.

PO BOX 45 GLENNALLEN, ALASKA 99588-0045

Glennallen (907) 822-3211
Valdez (907) 835-4301
Telefax # (907) 822-5586

October 30, 1989

Mr. Brent Petrie
Alaska Energy Authority
P.O. Box 190869
Anchorage, Alaska 99519-0869

Dear Brent:

During 1989 CVEA was able to collect data on just how much energy was spilling. We had previously estimated 14 to 16 million kwhs would be available. This year 25,768,863 kwhs spilled represented by the overflow charts attached for July, August, and September.

Brent, if you assume a return to the State of four (4) cents per kwh this represents a \$1,030,754.52 potential sale to the state. I believe, this is worthy of consideration in conjunction with discussion on tie lines between Copper Valley Electric and the Railbelt utilities.

Sincerely,

R.D. (Doug) Bursey
General Manager

attachments

c:\wp50\rdb\89-197

(APPENDIX D)

Page 1 of 4

SERVING MEMBER-OWNERS IN THE COPPER RIVER BASIN AND VALDEZ

SULOMON GULCH HYDRO
GULCH FLOW & LAKE OVERFLOW

JULY 1989

DATE	CFS 0000	CFS 0800	CFS 1600	AVG \ CFS TOTAL	ACRE \ FEET OVERFLOW	KWH LOST
1	281.6	281.6	255.7	273.0	541.4	306,445
2	352.5	328.3	321.6	334.1	662.7	375,113
3	363.1	363.1	271.7	332.6	659.8	373,429
4	308.2	284.9	255.7	282.9	561.2	317,634
5	284.9	278.3	255.7	273.0	541.4	306,445
6	241.2	234.0	190.8	222.7	441.7	249,976
7	231.1	225.1	180.1	212.1	420.7	238,113
8	207.7	210.5	170.2	196.1	389.0	220,188
9	202.0	204.8	172.6	193.1	383.1	216,820
10	202.0	180.1	177.5	186.5	370.0	209,411
11	225.1	243.2	204.8	224.4	445.0	251,884
12	252.5	255.7	204.8	237.7	471.4	266,815
13	237.1	213.4	175.0	208.5	413.6	234,071
14	188.1	180.1	149.9	172.7	342.5	193,881
15	141.7	141.7	121.5	135.0	267.7	151,520
16	128.4	124.9	107.3	120.2	238.4	134,942
17	154.2	155.4	143.7	151.4	300.4	170,006
18	196.3	202.0	193.5	197.3	391.3	221,460
19	228.0	216.3	156.4	200.2	397.2	224,791
20	202.0	200.0	175.0	192.3	381.5	215,922
21	177.5	185.4	156.4	173.1	343.3	194,330
22	152.0	154.2	141.7	149.3	296.1	167,611
23	158.6	180.1	210.5	183.1	363.1	205,519
24	237.1	255.7	234.0	242.3	480.5	271,979
25	222.1	196.3	160.8	193.1	382.9	216,745
26	158.6	141.7	121.5	140.6	278.9	157,844
27	133.9	130.2	110.3	124.8	247.5	140,106
28	139.7	132.0	116.6	129.4	256.7	145,308
29	143.7	143.7	149.9	145.8	289.1	163,644
30	275.0	152.0	265.2	230.7	457.7	259,032
31	240.1	240.1	193.5	224.6	445.4	252,109
					12461.3	7,053,090

ENAME: LAKE OVERFLOW

SOLOMON GULCH HYDRO
GULCH FLOW \ LAKE OVERFLOW

AUGUST 1989

DATE:	CFS 0000	CFS 0800	CFS 1600	AVG \ CFS TOTAL	ACRE \ FEET OVERFLOW	KWH LOST
1	188.1	216.3	284.9	229.8	455.7	257,946
2	321.6	331.8	284.9	312.8	620.4	351,126
3	255.7	219.2	204.8	226.6	449.4	254,354
4	199.1	170.0	170.2	179.8	356.6	201,814
5	165.4	202.0	145.7	171.0	339.2	192,010
6	160.8	163.1	156.4	160.1	317.6	179,735
7	188.1	180.0	175.0	181.0	359.1	203,236
8	180.1	156.4	130.2	155.6	308.6	174,646
9	163.1	113.4	87.0	121.2	240.3	136,027
10	82.8	87.0	89.0	86.3	171.1	96,847
11	113.4	111.8	100.0	108.4	215.0	121,695
12	124.9	130.2	133.9	129.7	257.2	145,570
13	128.4	160.8	145.7	145.0	287.5	162,746
14	152.0	149.9	111.8	137.9	273.5	154,813
15	116.6	102.8	90.0	103.1	204.6	115,782
16	97.5	93.8	74.0	88.4	175.4	99,279
17	79.9	83.9	66.7	76.8	152.4	86,257
18	61.7	71.0	80.9	71.2	141.2	79,931
19	91.5	132.0	172.6	132.0	261.9	146,227
20	216.3	228.0	185.4	209.9	416.3	235,643
21	180.1	152.0	132.0	154.7	306.8	173,673
22	143.7	130.2	97.5	123.8	245.6	138,983
23	128.4	113.4	98.7	113.5	225.1	127,420
24	152.0	190.8	152.0	164.9	327.1	185,162
25	172.6	373.8	237.1	261.2	518.0	293,197
26	365.8	523.8	202.0	530.5	1052.3	595,600
27	366.6	252.6	186.1	269.1	533.8	302,104
28	288.0	384.6	962.9	545.2	1081.3	612,028
29	931.6	962.9	763.2	886.0	1757.3	994,626
30	608.3	370.2	291.6	423.4	839.7	475,290
31	255.7	228.0	190.8	224.8	446.0	252,406
					13336.0	7,546,176

SOLOMON GULCH HYDRO
GULCH FLOW \ LAKE OVERFLOW

SEPTEMBER 1989

DATE:	CFS 0000	CFS 0800	CFS 1600	AVG \ CFS TOTAL	ACRE \ FEET OVERFLOW	FWH LOST
NOTE: LESS THAN 13 CFS = 0.0						
1	190.8	190.8	231.0	204.2	405.0	229,244
2	252.5	271.7	527.9	350.7	695.0	393,711
3	792.0	483.4	281.6	519.0	1029.4	582,653
4	237.1	172.7	123.2	177.7	352.4	199,457
5	121.5	202.0	1010.0	444.5	881.7	499,016
6	1343.0	777.2	536.1	885.4	1756.2	994,027
7	381.0	295.0	255.7	310.6	616.0	348,656
8	255.7	231.0	188.1	224.9	446.1	252,520
9	193.5	167.0	139.7	166.7	330.7	187,182
10	165.4	503.4	816.3	495.0	981.9	555,747
11	617.0	573.9	402.9	531.3	1053.8	596,424
12	298.3	338.0	291.6	309.5	613.9	347,459
13	249.4	228.0	160.8	212.7	422.0	238,824
14	130.2	113.4	78.9	107.5	213.2	120,684
15	65.4	54.7	29.7	49.9	99.0	56,057
16	20.8	18.3	9.9	16.3	32.4	18,337
17	6.9	6.3	5.8	6.3	12.6	0
18	5.6	5.6	11.8	7.7	15.2	0
19	5.1	5.1	6.1	5.4	10.8	0
20	5.8	5.7	5.9	5.8	11.5	0
21	0.1	9.1	79.1	31.4	62.3	35,288
22	288.3	311.5	845.8	481.9	955.8	540,965
23	630.2	366.6	377.4	456.1	908.6	514,246
24	758.5	1873.0	3033.0	1888.2	3745.1	2,119,740
25	2146.0	870.8	523.8	1180.2	2340.9	1,324,945
26	414.0	429.7	278.3	374.0	741.8	419,869
27	234.0	222.1	222.1	226.1	448.4	253,793
28	246.3	202.0	126.7	191.7	380.2	215,174
29	100.0	76.0	39.9	71.9	142.7	80,771
30	36.9	44.4	33.1	38.1	75.6	42,810
31				0.0	0.0	0
				19780.8	11,167,597	

FY 89 Statistics

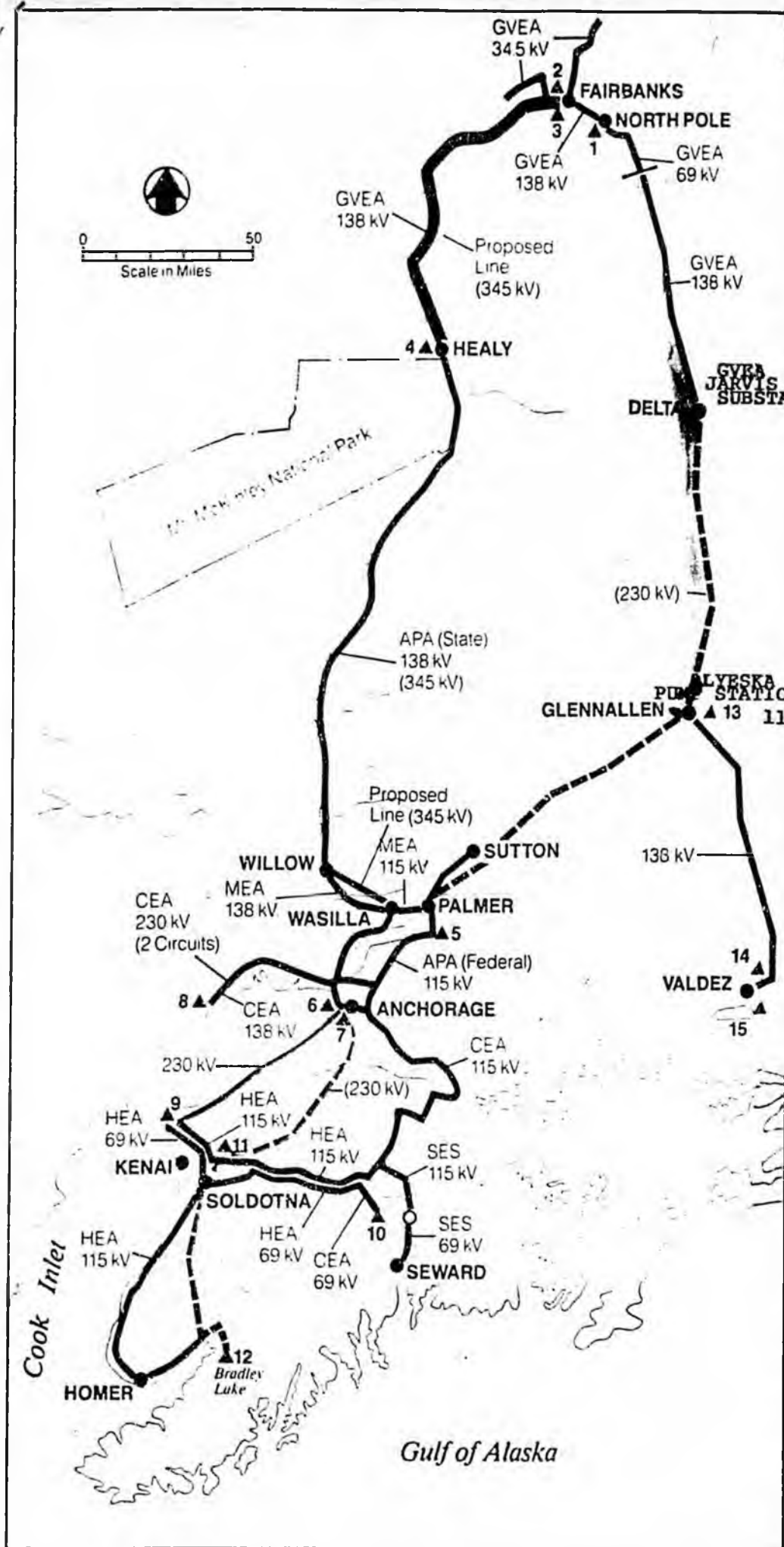
COPPER VALLEY
REVENUE RECAP-1989
FILENAME: \AUD89\REVRCP

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					PERCENTAGE		
					REVENUE	KWH SALES	I OF CONSUMERS
BY CUSTOMER CLASS	REVENUE	AWH SALES	I OF CONSUMERS	REV/AWH	REVENUE	KWH SALES	I OF CONSUMERS
G RESIDENTIAL	781,568	3,866,082	798	0.202	9.8%	7.5%	31.1%
V RESIDENTIAL	1,548,217	9,580,096	1,203	0.162	19.4%	18.5%	47.0%
G SMALL COMM'L	860,976	4,345,817	205	0.198	10.8%	8.4%	8.0%
V SMALL COMM'L	841,777	5,855,911	212	0.144	10.5%	11.3%	8.3%
G LARGE COMM'L	1,272,394	8,527,840	11	0.149	15.9%	16.5%	0.4%
V LARGE COMM'L	2,478,794	18,402,943	56	0.135	31.0%	35.5%	2.2%
V STREET LIGHTS	19,141	105,801	8	0.181	0.2%	0.2%	0.3%
V STREET LIGHTS	11,363	63,087	9	0.180	0.1%	0.1%	0.4%
G PUBLIC BLDGS	67,327	357,256	30	0.188	0.8%	0.7%	1.2%
V PUBLIC BLDGS	108,039	729,296	30	0.148	1.4%	1.4%	1.2%
TOTAL REVENUES	7,989,597	51,834,129	2,562	0.154	100.0%	100.0%	100.0%
BY DISTRICT							
G RESIDENTIAL	781,568	3,866,082	798	0.202	9.8%	7.5%	31.1%
G SMALL COMM'L	860,976	4,345,817	205	0.198	10.8%	8.4%	8.0%
G LARGE COMM'L	1,272,394	8,527,840	11	0.149	15.9%	16.5%	0.4%
G STREET LIGHTS	19,141	105,801	8	0.181	0.2%	0.2%	0.3%
G PUBLIC BLDGS	67,327	357,256	30	0.188	0.8%	0.7%	1.2%
TOTAL COPPER BASIN	3,001,407	17,202,796	1,052	0.174	37.6%	33.2%	41.1%
V RESIDENTIAL	1,548,217	9,580,096	1,203	0.162	19.4%	18.5%	47.0%
V SMALL COMM'L	841,777	5,855,911	212	0.144	10.5%	11.3%	8.3%
V LARGE COMM'L	2,478,794	18,402,943	56	0.135	31.0%	35.5%	2.2%
V STREET LIGHTS	11,363	63,087	9	0.180	0.1%	0.1%	0.4%
V PUBLIC BLDGS	108,039	729,296	30	0.148	1.4%	1.4%	1.2%
TOTAL VALDEZ	4,988,191	34,631,333	1,510	0.144	62.4%	66.8%	58.9%
TOTAL CVEA	7,989,597	51,834,129	2,562	0.154	100.0%	100.0%	100.0%
BY TYPE OF CUSTOMER							
RESIDENTIAL	2,329,785	13,446,178	2,001	0.173	29.2%	25.9%	78.1%
SMALL COMM'L	1,702,753	10,201,728	417	0.167	21.3%	19.7%	16.3%
LARGE COMM'L	3,751,188	26,930,783	67	0.139	47.0%	52.0%	2.6%
STREET LIGHTS	30,504	168,888	17	0.181	0.4%	0.3%	0.1%
PUBLIC BLDGS	175,366	1,086,552	60	0.161	2.2%	2.1%	2.3%
TOTAL REVENUES	7,989,596	51,834,129	2,562	0.154	100.0%	100.0%	100.0%

(APPENDIX E)

MONTH		PURCHASED POWER	GLENN NET GEN	VALDEZ NET GEN	TOTAL AVAIL	KWh SALES	12 MONTH ROLLING AVG LINE LOSS %	CALENDAR TOTALS				
								PURCHASED POWER	GLENN NET GEN	VALDEZ NET GEN	TOTAL AVAIL KWh	KWh SALES
December	1985	2,303,763	1,802,250	(75,277)	4,030,736	4,204,575	10.5%	36,749,950	10,151,260	792,199	50,733,415	45,401,085
January	1986	2,742,236	1,709,360	(61,926)	4,389,670	3,753,880	10.9%	72%	26%	2%	100%	
February	1986	2,590,026	1,400,380	(116,480)	3,871,526	3,893,884	11.0%					
March	1986	2,580,070	1,757,500	(161,726)	4,175,844	3,669,310	11.9%					
April	1986	1,345,950	2,643,076	(146,120)	3,842,906	3,600,269	9.6%					
May	1986	3,380,940	722,220	(3,670)	4,099,490	3,422,584	10.0%					
June	1986	3,455,554	(78,832)	(5,860)	3,370,862	3,671,715	10.1%					
July	1986	4,056,890	(53,066)	(2,040)	4,031,784	3,021,674	10.2%					
August	1986	4,165,573	219,752	(5,240)	4,322,085	4,151,221	9.6%					
September	1986	3,383,994	122,522	2,110	3,509,626	3,476,021	9.5%					
October	1986	3,924,595	115,834	(1,230)	4,039,199	3,139,959	10.0%					
November	1986	3,625,089	803,810	(27,900)	4,400,999	3,570,836	9.4%					
December	1986	3,212,626	1,026,022	(85,600)	4,152,048	4,206,014	9.6%	35,457,540	10,385,030	(618,704)	48,207,879	43,570,367
January	1987	2,755,800	1,615,354	(198,950)	4,172,204	3,639,373	9.0%	3%	22%	-1%	100%	
February	1987	3,003,040	961,542	(75,670)	3,884,912	3,653,546	9.6%					
March	1987	3,111,690	1,274,649	(119,830)	4,266,509	3,664,289	9.8%					
April	1987	2,146,580	1,747,916	60,540	3,955,036	3,880,099	9.4%					
May	1987	3,452,600	517,730	(40,500)	3,929,830	3,235,691	8.5%					
June	1987	3,739,954	(78,790)	(65,400)	3,645,764	3,316,605	10.8%					
July	1987	4,136,318	(30,030)	(49,210)	4,057,078	3,395,139	10.0%					
August	1987	3,966,541	213,874	5,172	4,185,587	3,886,528	10.3%					
September	1987	2,934,496	51,673	(124,340)	3,861,829	3,751,854	10.4%					
October	1987	4,028,669	(40,191)	(107,280)	3,881,198	3,675,436	9.0%					
November	1987	3,321,809	871,424	213,780	4,407,013	3,537,403	8.1%					
December	1987	3,015,390	1,019,848	152,840	4,188,078	3,750,601	10.1%	40,622,880	9,175,000	(347,115)	43,450,774	43,561,164
January	1988	3,180,000	1,406,220	156,460	4,742,680	4,289,084	10.2%	84%	17%	-1%	100%	
February	1988	2,591,792	1,298,860	137,560	4,028,212	3,690,897	10.3%					
March	1988	2,783,747	1,281,920	119,410	4,185,077	3,624,498	10.3%					
April	1988	1,373,945	2,277,080	16,245	3,667,270	4,043,449	9.4%					
May	1988	3,033,477	848,730	58,050	3,940,257	3,651,974	8.6%					
June	1988	3,215,942	461,300	(25,530)	3,651,712	2,883,168	9.5%					
July	1988	4,221,709	78,800	(37,225)	4,263,284	3,771,322	9.1%					
August	1988	4,229,479	11,194	(53,655)	4,186,919	3,828,933	9.2%					
September	1988	3,978,686	(32,520)	(23,660)	3,922,606	3,867,492	9.1%					
October	1988	4,028,387	85,440	(30,100)	4,083,727	3,489,060	9.8%					
November	1988	3,430,744	928,670	(61,430)	4,297,984	3,580,925	9.5%					
December	1988	2,771,156	1,573,960	0	4,345,116	3,854,630	9.6%	38,839,064	10,219,654	256,132	49,314,850	44,574,433
January	1989	3,321,842	2,045,130	(172,750)	5,194,222	4,259,735	10.5%	75%	21%	1%	100%	
February	1989	2,087,714	1,763,950	(129,940)	3,721,724	4,326,663	8.6%					
March	1989	2,855,431	1,812,950	(96,650)	4,571,731	3,394,775	9.8%					
April	1989	795,659	1,575,590	-1,859,530	4,230,719	4,402,260	10.1%					
May	1989	2,816,599	1,556,662	(15,300)	4,357,961	3,577,311	11.0%					
June	1989	2,149,365	1,445,490	(46,330)	3,548,525	4,310,097	8.0%					
July	1989	2,303,144	1,496,642	(28,130)	3,771,656	4,295,844	6.1%					
August	1989	3,456,934	1,528,100	(33,390)	4,951,644	4,646,803	5.9%					
September	1989	4,654,540	10,318	(24,900)	4,639,958	4,877,229	5.2%					
October	1989	4,495,374	484,386	(27,250)	4,952,510	4,456,037	4.9%					
November	1989	3,483,144	2,294,860	(96,590)	5,681,414	4,940,380	4.9%					
December	1989	2,670,147	2,471,150	(159,950)	4,981,347	4,346,995	5.1%	35,089,890	15,485,228	1,028,290	54,603,411	51,834,129
								64%	34%	2%	100%	



HOUSE BILL 454
PROPOSAL

Railbelt Generation and Transmission Systems

LEGEND

- Community
- ▲ Generation Station
- 2 Generation Station Identification Number
- 230 kV Line Capacity
- Line Capacity Change
- Northeast Transmission Line Route (Proposed)
- Parks Highway Line (Proposed)
- Fritz Creek Transmission Line (Proposed)
- Enstar Gas Pipeline Route (Proposed)
- Tesoro Products Line Route (Proposed)
- Transmission Line Route (Existing)
- Bradley Junction to Soldotna Line (under construction)
- Bradley Transmission Line (part of Bradley Lake Project)

(Prepared by ARECA—January 1989)

1. Oil Fired Generation — 121.8 mW — Golden Valley Electric Association — North Pole
2. Oil Fired Generation — 40.6 mW — Fairbanks Municipal Utilities System — Fairbanks
Coal Fired Generation — 28.6 mW — Fairbanks Municipal Utilities System — Fairbanks
3. Oil Fired Generation — 51 mW — Golden Valley Electric Association — Fairbanks
4. Coal Fired Generation — 25 mW — Golden Valley Electric Association — Healy
5. Hydroelectric Generation — 30 mW — Alaska Power Administration (Federal) — Eklutna
6. Natural Gas Generation — 330 mW — Anchorage Municipal Light & Power — Anchorage
7. Natural Gas Generation — 49.4 mW — Chugach Electric Association — Anchorage
8. Natural Gas Generation — 360 mW — Chugach Electric Association — Beluga
9. Natural Gas Generation — 81.7 mW — Chugach Electric Association — Bernice Lake
10. Hydroelectric Generation — 17.4 mW — Chugach Electric Association — Cooper Lake
11. Natural Gas Generation — 38.5 mW — Alaska Electric Generation & Transmission — Soldotna
12. Hydroelectric Generation — 90 mW — Alaska Power Authority (State) — Bradley Lake
13. Oil Fired Generation — 10.4 mW — Copper Valley Electric Association — Glennallen
14. Oil Fired Generation — 7.2 mW — Copper Valley Electric Association — Valdez
15. Hydroelectric Generation — 12 mW — Alaska Power Authority (State) — Solomon Guich

(APPENDIX G)