

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672
2665 SCOMM 120 HOUSE SPEC. COMM. UTILITY RESTRUCTURING, 1999-2000

Alaska State Legislature

REPRESENTATIVE
GENE THERRIAULT

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House Of Representatives

While in session
State Capitol
Juneau, Alaska
99801-1182
(907) 465-4797
Fax: (907) 465-3884
House District 33

House Bill 62

"An Act relating to the Alaska Public Utilities Commission; and providing for an effective date."

Sponsor

Representative Gene Therriault

A handwritten signature of Gene Therriault in dark ink.

Sponsor Statement

Under AS 42.05 and 42.06, the Alaska Public Utilities Commission regulates public utilities by certifying qualified providers of public utility and pipeline services. It is designed to ensure that utilities provide safe and adequate services and facilities at reasonable rates. The five-member Commission also determines the eligibility and the per kilowatt-hour support for electric utilities under the Power Cost Equalization program (AS 42.45).

The Alaska Public Utilities Commission is set to expire June 30, 1999 under AS 44.66.010, Termination of state boards and commissions. If the Legislature does not act to extend the Commission, it would have one year, until June 30, 2000, to conclude its affairs. House Bill 62 will extend the Commission for another four years.

The title has intentionally been left broad enough to allow leeway for discussion of several issues of concern that have arisen during the past four years of the Commission's existence.

FISCAL NOTE

STATE OF ALASKA
1999 LEGISLATIVE SESSION

BILL NO. HB 62

Revision Date/Time (Note if correction) _____

Title Alaska Public Utilities Commission

Dept. Affected _____

BRU _____

AK Public Utilities Commission

Component _____

APUC Operations

Sponsor Rep. Theriault

Requester Com.on Util. Restructuring, Labor & Commerce

Component Serial No. _____

346

Expenditures/Revenues

(Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES						
-----------------------------	--	--	--	--	--	--

CHANGE IN REVENUES ()						
-------------------------------	--	--	--	--	--	--

FUND SOURCE

(Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other 1110 APUC Rcpts	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY99) cost: _____

0.0

POSITIONS

Full-time	0	0	0	0	0	0
Part-time	0	0	0	0	0	0
Temporary	0	0	0	0	0	0

ANALYSIS: (Attach a separate page if necessary)

The zero fiscal note, has attached to it the summary of the Governor's FY2000 request for the Commission of \$4699.2 The Commission anticipates this level of funding would continue from FY 01-FY 05, in the event that the Commission's sunset date is extended.

Prepared by _____

Division APUC

Phone 263-2112

Date/Time 2/11/99 3:51 PM

Approved by Commissioner _____

Agency _____

Date _____

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Component Detail
Department of Commerce and Economic Development

Component: APUC Operations
BRU: Alaska Public Utilities Commission

	FY1998 Actuals	FY1999 ABS Conference Committee	FY1999 Authorized	FY2000 Adjusted	FY2000 Governor	FY1999 Authorized Vs FY2000 Governor	
71000 Personal Services	2,628.2	2,839.9	2,850.8	3,287.0	3,287.0	436.2	15.3%
72000 Travel	51.3	35.0	35.0	35.0	35.0	0.0	0.0%
73000 Contractual	1,084.3	1,525.2	1,961.4	1,600.9	1,300.9	-660.5	-33.7%
74000 Supplies	71.9	62.5	62.5	62.5	62.5	0.0	0.0%
75000 Equipment	16.2	13.8	13.8	13.8	13.8	0.0	0.0%
76000 Land/Buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
77000 Grants, Claims	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
78000 Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Totals	3,851.9	4,476.4	4,923.5	4,999.2	4,699.2	-224.3	-4.6%
Funding Sources :							
1110 APUC Rcpts	3,851.9	4,476.4	4,923.5	4,999.2	4,699.2	-224.3	-4.6%
Positions :							
Permanent Full Time	46	46	46	55	55	9	19.6%
Permanent Part Time	0	0	0	0	0	0	0.0%
Non Permanent	0	0	0	0	0	0	0.0%

Public hearing on HB 101
3/3/99
Utilities Restructuring Committee
Contents

HB 101 "reinstatement of corporations that are public utilities"

Sponsor statement by Rep. Morgan

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Comments by AK Telephone Assn.

Comments by Bush-Tell inc.

Alaska State Legislature

SESSION

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MEMBER

Community & Regional Affairs Committee
Health, Education & Social Services Committee
House Resources Committee
Special Committee on Fisheries



Representative Carl M. Morgan, Jr. District 36

Sponsor Statement HB 101

**"An Act relating to the reinstatement of corporations that are public utilities;
and providing for an effective date"**

This legislation is a vehicle to allow the Alaska Department of Commerce and Economic Development the discretion to reinstate, as a corporation, a local exchange (telecommunications) company that serves several communities in western Alaska.

After reviewing the facts and circumstances surrounding the issue, I hope that you will agree that this measure warrants our attention and support. The following are the facts surrounding the involuntary dissolution of Bush-Tell.

Bush-Tell is a small, rural local exchange telephone company located in Aniak, Alaska, which provides local exchange telephone service to ten small villages in Western Alaska. Bush-Tell was incorporated on November 10, 1969 and has been providing telecommunications service since 1970. Mr. Harry "Bob" Colliver, Jr., the President and sole shareholder of Bush-Tell, recently contacted the Alaska Division of Banking, Securities & Corporations to find out about registering a "dba" and was informed that Bush-Tell was no longer registered as a corporation with the division. Bush-Tell had been involuntarily dissolved in 1993 for failing to file its biennial report and/or failing to pay its biennial corporate tax for the period ending December 31, 1992. Upon investigation, it was discovered that Bush-Tell's registered agent had failed to follow the proper statutory procedures for resigning as a registered agent and that his omissions resulted in the involuntary dissolution of Bush-Tell.

Bush-Tell's designated agent was a sole practitioner in Anchorage, Alaska who also served as Bush-Tell's general counsel. In the early 1980's, Bush-Tell hired another law firm to do its legal work but continued to retain the sole practitioner as its registered agent. The forms for Bush-Tell's biennial reports were sent to the registered agent and were filed by the registered agent up to and including the period ending December 31, 1990.

In 1991, the registered agent left the private practice of law, closed his office and left a forwarding address for his mail with the U.S. Postal Service. The registered agent did not inform the Alaska Division of Banking, Securities & Corporations that his address was changing or that he was resigning as Bush-Tell's registered agent. Alaska Statute 10.06.170(b) requires that, if a registered agent resigns, the registered must file a

Page Two
Sponsor Statement
HB 101

written notice with the commissioner setting out the latest address of the principal office of the corporation and the names, addresses and titles of the most recent officers of the corporation. The commission must then immediately mail a copy of the notice to the corporation at its principal office.

On July 12, 1993, the Alaska Division of Banking, Securities & Corporations sent a notice by certified mail to Bush-Tell, care of the registered agent, informing Bush-Tell that it had not filed its biennial report and/or tax for the period ending December 31, 1992 and that, if the biennial report and/or tax are not mailed by September 19, 1993, the Certificate of Involuntary Dissolution will be issued and the corporation will cease to exist as of September 20, 1993. This notice was returned to the Alaska Division Banking, Securities & Corporations because the register agent's forwarding notice had expired. On September 20, 1993, Bush-Tell was involuntarily dissolved.

Since the time of dissolution, and even after discovering the involuntary dissolution, Bush-Tell has observed all of the corporate procedures required by its Bylaws and Alaska law including holding regular board of directors meetings and paying corporate income tax.

I urge your support of HB 101.

FISCAL NOTE

STATE OF ALASKA
1999 LEGISLATIVE SESSION

BILL NO. HB 101

Revision Date/Time (Note if correction) _____

Title Corporate Public Utility Reinstatement

Dept. Affected Commerce & Econ. Dev.

BRU Banking, Securities and Corporations

Component Banking, Securities and Corporations

Sponsor Rep. Morgan

Requester House URS

Component Serial No. 1233

Expenditures/Revenues

(Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES						
-----------------------------	--	--	--	--	--	--

CHANGE IN REVENUES ()	0.0	0.0	0.0	0.0	0.0	0.0
-------------------------------	------------	------------	------------	------------	------------	------------

FUND SOURCE

(Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type)						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY99) cost: _____

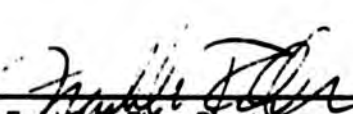
POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: (Attach a separate page if necessary)

Prepared by
Division

Approved by Commissioner
Agency


Franklin T. Elder, Director
Banking, Securities and Corporations


Deborah B. Sedwick
Commerce and Economic Development

Phone 465-2521

Date/Time 3/1/99 3:58 PM

Date 3/1/99

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STATE OF ALASKA

DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT

DIVISION OF BANKING, SECURITIES, AND CORPORATIONS

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HOUSE BILL NO. 101

REINSTATEMENT OF PUBLIC UTILITY CORPORATIONS

In reviewing HB 101, the Division of Banking, Securities and Corporations supports the language and intent of this bill. Indeed, the Division feels that it is in the best interest of the State of Alaska to continue to help keep entities active and in good standing with the State. Public utility corporations provide important public services to citizens of Alaska.

In the past, it has been the Division's policy to send statutorily required biennial reports to a corporation's, or an entity's, registered agent. Corporations complete the report and return it with any required taxes or fees to the Division. Receipt of these completed reports and fees by this Division determine the compliance of each entity. However, an episode occurred a couple of years ago in which a service company, who acts as registered agent for a large number of Alaska corporations, misplaced a large number of reports. Because of this episode, the Division changed policy and started sending these reports to the principal business address of each corporation. Unfortunately, not all corporations keep the Division apprised of their address changes. Therefore, for those reports that are returned as undeliverable by the U. S. Post Office, the Division resends the report to the registered agent. We have increased our diligence in working with corporations to avoid to the maximum extent possible inadvertent dissolving of businesses.

Alaska Telephone Association

201 E. 50th, Suite 114
Anchorage, AK 99518
(907) 563-4000
FAX (907) 562-3776

David Fauske
President

James Rowe
Executive Director

BY FACSIMILE

The Honorable Bill Hudson, Chairman
House Utility Restructuring Committee
State Capitol
Juneau, Alaska 99801

Re: H.B. 101

Dear Representative Hudson:

I am writing in support of H.B. 101, which is the reinstatement of public utility corporations. The Alaska Telephone Association supports this measure because of its importance to local telephone service provider Bush-Tell, Inc.

The current ownership and management of Bush-Tell, Inc. has been the same since its inception in 1969. Since that time the corporation has provided service, often in challenging conditions, to many small communities in western Alaska, including Aniak, Red Devil, Crooked Creek, Shageluk, Sleetmute and Stony River. This corporation has always done an outstanding job of providing reliable telecommunications services while being an integral part of the community and good corporate citizen.

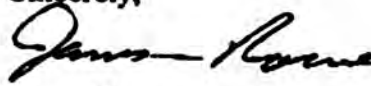
Through a set of unfortunate circumstances Bush-Tell, Inc. was involuntarily dissolved in 1993. Even after learning of the involuntary dissolution last summer, Bush-Tell continued to hold Board meetings, conduct business, pay all corporate income taxes, and conduct its affairs as if it had not been dissolved.

Upon discovering that it had been involuntarily dissolved, Bush-Tell, Inc. approached the Department of Commerce and learned that it would take an act of the Legislature to obtain reinstatement.

Given this unique set of circumstances and the excellent record that Bush-Tell, Inc. has in providing telephone service in rural Alaska, I hope that the Legislature recognizes the importance of Bush-Tell to its customers and quickly passes this legislation. The members of the Alaska Telephone Association believe that Bush-Tell, Inc. has in the past and will in the future provide a very necessary public service.

Thank you for your consideration.

Sincerely,


James Rowe



BUSH-TELL, INC.

Box 109 • Aniak, Alaska 99557 • (907) 675-4311

The Honorable Bill Hudson, Chairman
House Utility Restructuring Committee
State Capitol
Juneau, Alaska 99801

Re: H.B. 101

Dear Representative Hudson:

I am President and sole shareholder of Bush-Tell, a small, rural local exchange telephone company located in Aniak, Alaska. Bush-Tell, Inc. provides local exchange telephone service to ten small villages in Western Alaska.

I moved to Alaska in 1958 and worked as a technician providing maintenance and operations services to the White Alice Communications system from 1958 to 1978. I started Bush-Tell in 1969 and worked as both the full-time manager of Bush-Tell and as a technician on the White Alice Communications and have since devoted all of my time to managing Bush-Tell. I have lived in Aniak for approximately 39 years.

This year, I contacted the Alaska Division of Corporations to find out about registering as a "dba" and was informed that Bush-Tell was no longer registered as a corporation with the Alaska Division of Corporations. I further learned that Bush-Tell had been involuntarily dissolved in September 1993 for failing to file its biennial report and/or failing to pay its biennial corporate tax for the period ending December 31, 1992, that Bush-Tell's registered agent failed to follow the proper statutory procedures for resigning as a registered agent and that his omissions resulted in the involuntary dissolution of Bush-Tell in 1993. (The State did not send any notices to me informing me that Bush-Tell had not filed its biennial report and/or paid the biennial corporate tax for the period ending December 31, 1992 and that, if the biennial report and/or tax were not mailed by September 19, 1993, the certificate of Involuntary Dissolution would be issued and the corporation would cease to exist as of September 20, 1993.)

Since the time of dissolution, and even after discovering the involuntary dissolution, Bush-Tell has observed all of the corporate procedures required by its Bylaws and Alaska law including holding regular board of directors meetings and paying corporate income taxes.

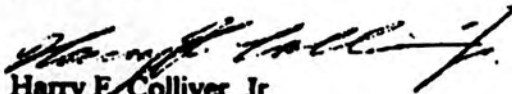
My company performs a necessary public service, especially for residents of rural Alaska. Telecommunications services are vital for emergencies, for businesses and for a full range of human and social needs. Bush-Tell, Inc. has provided an outstanding job in providing service in rural Alaska, and its corporate dissolution took place through no fault of mine or any of my

employees. Rather, the dissolution arose out of the neglect of a registered corporate agent.

Upon learning of Bush-Tell's involuntary dissolution, I sought reinstatement from the Alaska Department of Commerce. However, the Department of Commerce advised me that it was unable to reinstate Bush-Tell because too much time had passed and that a legislative enactment would be required. I understand that the Alaska Legislature has passed similar legislation in the past. Under the circumstance, I am hopeful that the Alaska Legislature would pass H.B. 101.

Thank you for consideration of this matter, which is extremely important to my customers and to me,

Sincerely,


Harry E. Colliver, Jr.
President, Bush-Tell, Inc.

FOUR DAM POOL and FOUR DAM POOL TRANSFER FUND

General Information

Four Dam Pool – Background

The following hydroelectric projects and related transmission lines compose the Four Dam Pool -- projects owned by the Alaska Energy Authority/AIDEA:

Solomon Gulch Hydroelectric Project

Copper Valley Electric Association (CVEA), serving the Glenallen-Valdez area, operates the project and purchases wholesale power from it.

Swan Lake Hydroelectric Project

Ketchikan Public Utilities, serving the Ketchikan area, operates the project and purchases wholesale power from it.

Terror Lake Hydroelectric Project

Kodiak Electric Association, serving the Kodiak-Port Lyons area, operates the project and purchases wholesale power from it.

Tyee Lake Hydroelectric Project

The City of Petersburg and the City of Wrangell purchase wholesale power from the project. Thomas Bay Power Authority, a consortium of the two communities, operates the project.

The hydroelectric projects were respectively initiated by the communities/utilities now served by the projects. CVEA financed the construction of Solomon Gulch with federal loans; the other projects were initiated with state loans. In 1981-1982 the communities asked the State to take over ownership of the projects, each at different stage of construction, to insure their financing and completion. Consequently, the state loans were re-designated as grants, the State appropriated capital funds to cover part of the costs to construct the facilities, and the former Alaska Power Authority issued \$200 million Variable Rate Demand Bonds for the interim financing of portions of the construction costs of three facilities.

The overall cost of construction of the four facilities as of December 31, 1992, based on AEA's records available to this Division, was about \$500 million, funded as follows:

	State Appropriations	Proceeds from Investment	State Loan	Total Cost
Solomon Gulch	47,490,000	23,692,000	3,158,000	74,340,000
Swan Lake	73,075,000	-	23,551,000	96,626,000
Terror Lake	89,334,000	-	110,646,000	199,980,000
Tyee Lake	<u>85,000,000</u>		<u>44,040,000</u>	<u>129,040,000</u>
Total \$	294,899,000	23,692,000	181,395,000	499,986,000

The hydroelectric systems were initially stand-alone projects. However, 1984 legislation recognized the four facilities as one project, AS 44.83.398 (a). On October 28, 1985, AEA and the utilities/communities purchasing wholesale power from the systems (purchasers), entered into a forty-five (45) year Long Term Power Sales Agreement (LTPSA). The LTPSA is a "take and pay" contract in that the purchasers obligation is limited to the power they opt to purchase, and AEA is not obligated to provide power if not available.

Under the terms of the LTPSA, the cost of wholesale power must include production costs plus about 4 cents per kwh, called debt service component, to cover AEA's financing costs on the state loan. In the years 2000 and 2015, the wholesale power rate can be "re-opened" and the debt service component may include interest and principal on the state loan. The purchasers have contractually agreed to accept debt service on a capital of \$189,642,600, subject to the rate re-opener clause.

The power purchasers pool the respective cost of operating the four hydroelectric projects and the debt service; this results in an equal wholesale hydroelectric power rate for all purchasers. The annual common wholesale rate is about 6 cents/kwh.

Four Dam Pool Transfer Fund and State Loan

In 1984, as the \$200 million Variable Demand Bonds became due, the State appropriated \$210 million to the Power Development Revolving Loan Fund (PDRLF) for a loan to AEA for the long-term financing of the Four Dam Pool hydroelectric projects. AEA paid off the interim financing, lapsed substantial amounts to the general fund, and used the remaining loan proceeds to complete construction of the facilities.

The PDRLF was initially administered by the Division of Investments/DCED. In 1989 the fund was transferred to AEA (AS 44.83.500). Chapter 18, SLA 93 repealed the PDRLF and transferred its assets to the Four Dam Pool Transfer Fund (AS 42.45.040), administered by the Division of Energy.

The Four Dam Pool Transfer Fund is now the holder of the Loan Agreement between the State of Alaska and AEA. The loan is secured by: Promissory Notes totaling about \$185 million; all revenues from the Four Dam Pool systems; AEA's rights under any agreement related to the systems and AEA's resulting rights to receive payments. The loan is also secured by the assets of the hydroelectric projects in the Four Dam Pool.

Until the year 2000, the estimated annual stream of revenue to the Four Dam Pool Fund, for debt service on the state loan, is about \$ 10-11 million (interest only). The debt service is equal to the debt service component that AEA collects under the terms of the LTPSA, represented by a charge of 4 cents/kwh on contracted forecast sales, and 3 cents/kwh additional sales.

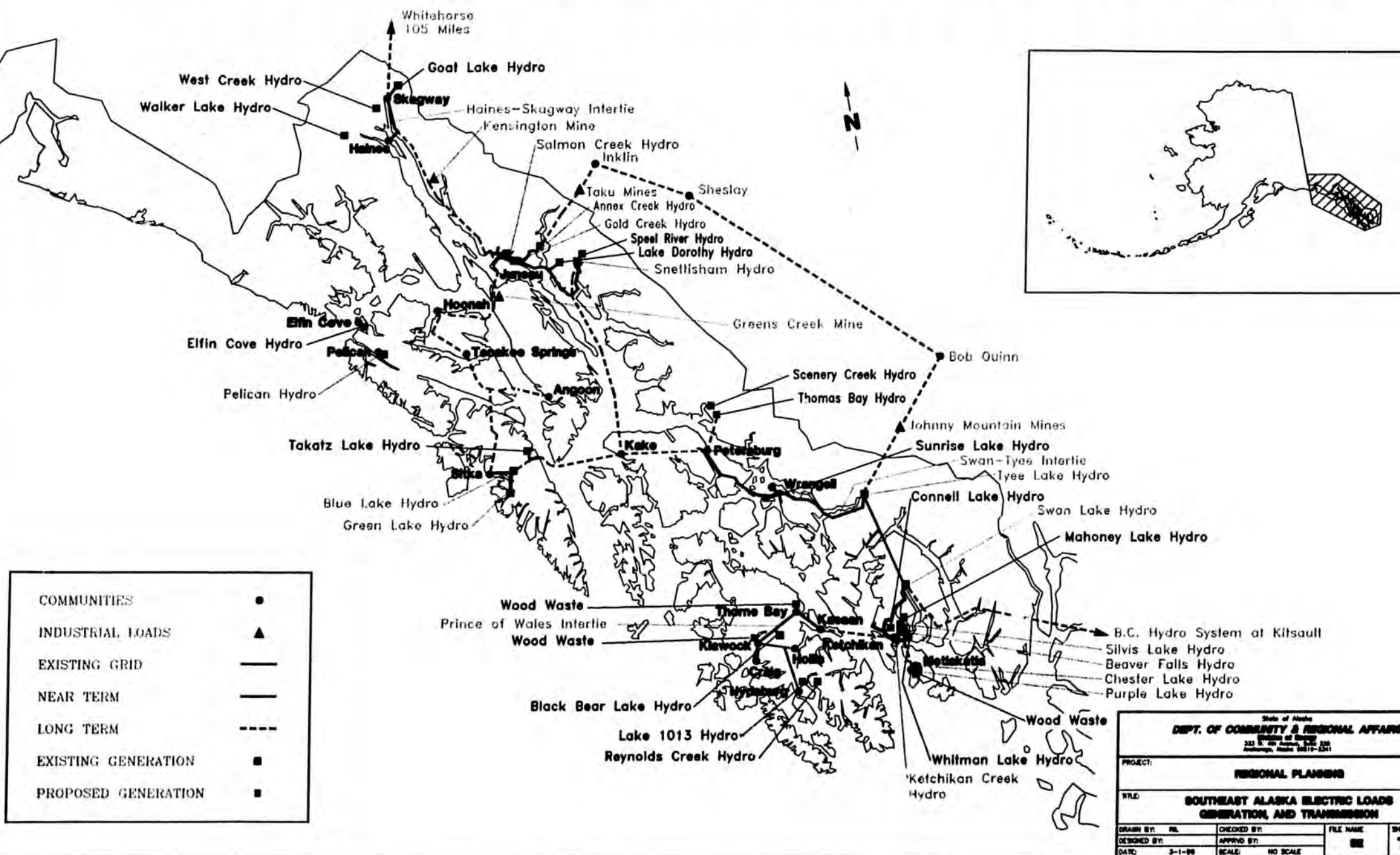
As mentioned earlier, the revenue to the Four Dam Pool Transfer Fund is subject to the terms of the LTPSA. Therefore its amount varies depending on the power purchased and/or available; it also depends on determinations made by AEA and the wholesale power purchasers to retain part or all of the debt service to cover certain project risks.

When available, the revenue for a given fiscal year period (July 1-June 30) is deposited directly in the fund by the wholesale power purchasers in a lump amount, by July 31st. Subject to appropriation, the balance of the Four Dam Pool Transfer Fund can be allocated to other named statutory funds as follows:

- 40% to the Power Cost Equalization and Rural Electric Capitalization Fund;
- 40% to the Southeast Energy Fund;
- 20% to the Power Project (revolving loan) Fund.

AEA and the wholesale power purchasers retained debt service up through July 1998, for a total of about \$16 million.

SOUTHEAST ALASKA ELECTRIC LOADS, GENERATION, AND TRANSMISSION



**DEPARTMENT OF COMMUNITY AND REGIONAL AFFAIRS
DIVISION OF ENERGY**

POWER COST EQUALIZATION (PCE)

PCE is a statutory program established in AS 42.45.100-170. The program helps rural electric utility customers by paying part of their electricity costs through the local utility. PCE provides relief to over 32,000 electric customers: residential, commercial, public schools and community facilities. Customers that are state or federal offices are not eligible for PCE. PCE reaches 195 communities with a total population of 77,000. In those communities the cost of electric service without PCE would affect a great part of a customer's disposable income.

In FY99 the program is being funded by the Power Cost Equalization and Rural Electric Capitalization Fund, and the same source is reflected in the FY2000 Operating Budget request. The program was funded by the General Fund through FY94.

Program Chronology

The first electric power assistance program was established in 1980 and was administered by the Alaska Energy Authority/DCED (formerly Alaska Power Authority) as the Power Production Cost Assistance program under AS 44.56.162 (renumbered AS 44.83.162). The program was amended and renamed Power Cost Assistance in 1981 and again, amended and renamed Power Cost Equalization in 1984. In August 1993, upon enactment of Chapter 18 SLA. 1993, it was transferred from the Alaska Energy Authority to the Department of Community and Regional Affairs/Division of Energy.

Program Background

The program addresses one of the many facets of the energy needs in Alaska. It has always been part of the state energy plan to balance the needs and solutions applicable to different areas of the state. The program, in its initial form, was established as part of HCS SB 438/SLA 1980, an omnibus energy bill that established several other new energy programs for the State. Prior legislatures provided capital appropriations for the development of state-owned electric systems providing long-term benefits to the local population. The following major projects were funded and developed:

- 1) Willow to Healy Intertie (commonly referred to as the Anchorage-Fairbanks Intertie), 50% funding of the Bradley Lake Hydroelectric Project, serving the railbelt area;
- 2) The Four Dam Pool, comprised of four hydroelectric projects:

Solomon Gulch, serving the Valdez-Glennallen area;
Swan Lake, serving the Ketchikan area;
Terror Lake, serving the Kodiak-Port Lyons area, and
Tyee Lake, serving the Petersburg and Wrangell areas.

These projects were developed with about 60% in capital appropriations and a state loan that covered the remaining 40%.

PCE was established to provide relief in other parts of the state where the development of major projects was not financially feasible. These communities are not served by roads and experience very high costs of producing electricity, usually by diesel generation and include the high costs of transportation. These high costs must be recovered from the limited number of residents/customers with limited, disposable income associated with a generally low economic development.

During SLA 1993, the legislature provided again for the statewide energy needs in Chapters 18 and 19 and continued to tie PCE to other state energy programs. Among other things, the state provided:

- 1) over \$150 million in grants and loans for the development of electric interties in the railbelt and Southeast Alaska;
- 2) \$ 66.9 million for the capitalization of the new Power Cost Equalization and Rural Electric Capitalization Fund (PCE&RECF). This fund provided for PCE and for Small Utility Improvements matching grants (up to 75% state match) to utilities participating in PCE for projects that will reduce the cost of power. Funding for Utility Improvement grants was eliminated in FY97.
- 3) established the Four Dam Pool Transfer Fund. This fund is expected to receive all the revenue associated with the state loan that financed the construction of the Four Dam Pool. The fund owns promissory notes totaling about \$185 million, and the projected annual debt service revenue through the year 2000 is \$10-11 million.

Subject to annual appropriation, the balance in this fund is allocated to energy needs in rural Alaska:

- 20% to the Power Project Fund and
- 40% to the PCE&RECF
- 40% for the development of an intertie between Swan Lake and Tyee Lake.

Concerns

Assuming a regular stream of revenue to the PCE&RECF, the fund could provide for PCE up to FY99 but no monies would be available for Utility Improvement grants. In FY2000 the fund would be depleted except for the assumed revenues from the Four Dam Pool Transfer Fund (FDPTF). A point of concern is that the revenue stream from the FDPTF may be interrupted or reduced at anytime due to a lack of revenue, or lack of legislative appropriation permitting the transfer. Any change to this stream of revenue would affect the PCE&RECF projections in Attachment 1.

The Alaska Energy Authority/AIDEA, is responsible for collecting the revenues for deposit in the FDPTF. Revenues collected for the past 5 fiscal years are as follows:

FY94: \$11,685,254 transferred to the Division of Energy;
 FY95: \$10,734,405 transferred to the Division of Energy;
 FY96: \$6,638,525 transferred; \$4,000,000 retained by AIDEA/AEA
 for repairs/upgrades to the hydroelectric projects;
 FY97: \$5,100,000 transferred; \$4,400,000 retained by AIDEA/AEA;
 FY98: \$5,345,311 transferred; \$5,500,000 retained by AIDEA/AEA for
 repairs/upgrades to the hydroelectric project;
 FY99: Reduction of \$1,600,000 per AIDEA/AEA for repairs; debt service payment is
 estimated to be \$9,600,000

Program Growth and Funding Levels

The growth of the program requirements are linked to the growth of the electric customers, resulting from increased population in the communities served, and to the increased cost of the local utilities for generating and transmitting power (fuel and non fuel costs). The resulting impact on program requirements equate to a fiscal growth of about 2% from year to year.

The program growth does not result from increased use of electricity by the eligible customers. The program wide, average monthly eligible consumption has been consistently well below 400 kwh per month, while the program permits PCE benefits up to 700 kwh per month.

However, independent from its growth, the program requirements have not always been fully funded. Attachment 2 shows the history of pro-rata reductions while Attachment 3 shows by fiscal year, the annual expenditures and percentage of actual program requirement at which disbursements were made.

According to the 4DP Power Sales Agreement, a rate re-opener with respect to Four Dam Pool debt service can be exercised by the State in the year 2000. However, the rate re-opener cannot lead to retail rates that exceed the statewide average.

**Department of Community and Regional Affairs
Division of Energy**

**Power Cost Equalization and Rural Electric Capitalization (PCE) Fund
Projection of Revenues and Expenditures**

	FY	1999	2000	2001	2002	2003	2004	2005	2006
Fund balance at beginning of fiscal year		\$17,144	\$3,202	\$0	\$0	\$0	\$0	\$0	\$0
Revenues									
G. F. Appropriation To Fund PCE at \$17.0 Million per Year		0	9,619	12,138	12,088	12,039	11,989	11,939	11,931
PCE Fund Investment Income		1,000	495	495	495	495	495	495	495
40% of Four Dam Pool Debt Service		2,058	3,685	4,367	4,417	4,467	4,517	4,567	4,574
Total		3,058	13,798	17,000	17,000	17,000	17,000	17,000	17,000
Expenditures									
PCE Expenditure Capped at \$17.0 Million per Year		17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Utility Improvement Grants -- Zero		0	0	0	0	0	0	0	0
Total		17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Surplus (Shortage)		(13,942)	(3,202)	0	0	0	0	0	0
Fund balance at end of fiscal year		\$3,202	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

- All dollars in thousands.
- PCE Fund investment income (FY1999) = actual 1st qtr plus estimated for balance of year.
- PCE Fund investment rate (FY2000 - 2006) = 6% of average Fund balance.
- Four Dam Pool FY2000 debt service estimated at \$10.8 million minus \$1.6 million "self-help"
- Four Dam Pool FY2001-2006 debt service estimates not adjusted for "self-help." Projected debt service will be reduced when self-help estimates are available from AIDEA.

PCE "Full Formula" -- Revised (Plus 2.5% Annual Growth):	22,400	22,960	23,534	24,122	24,725	25,344	25,977	26,627
Projected Four Dam Pool Debt Service:	5,145	9,212	10,918	11,043	11,167	11,292	11,417	11,436

POWER COST EQUALIZATION**History of Pro-Rata Reductions
per AS 42.45.110 (i)**

FY92 (Annual Average 81.67%)	
July 91	100%
August 91-June 92	80%
FY93 (Annual Average 89.17%)	
July 92	80%
August 92-June 93	90%
FY94 (Annual Average 95%)	
July-August 93	90%
September 93-April 94	95%
May-June 94	100%
FY95 (Annual Average 97.5%)	
July 94-April 95	100%
May-June 95	85%
FY96 (Annual Average 97.5%)	
July-August 95	85%
September 95-June 96	100%
FY97 (Annual Average 85%)	
July 96-June 97	85%
FY98 (Annual Average 85%)	
July 97-June 98*	85%
FY99 (Annual Average **%)	
July 98-**	85%

*Base rate change to 9.9 ¢/kwh was approved by APUC on 1/29/99, effective with 9th month billing cycle (March 1999).

**FY98's 15% reduction will remain in effect for FY99 and it is expected that the reduction will remain in effect throughout FY99. Program costs will continue to be monitored to determine if further reduction is necessary.

Prepared by Division of Energy/DCRA

February 1999

PCE ITD EXP & PRORATA RED HISTORY

POWER COST EQUALIZATION and Preceding Programs

Annual Expenditures
(extracted from PCE Statistical Reports)

Program Title	Fiscal Year	Amount Disbursed	Percentage of Actual Program Requirement
Power Production Cost Assistance	81	\$ 2,183,168	100%
Power Cost Assistance	82	6,419,408	100%
Power Cost Assistance	83	8,327,152	100%
Power Cost Assistance	84	8,740,820	100%
Power Cost Equalization	85	13,770,449 ^A	100%
	86	17,785,390	100%
	87	16,771,338	100%
	88	17,018,680	100%
	89	17,104,631	100%
	90	17,785,256	100%
	91	19,607,435	100%
	92	15,731,165	81.67%
	93	17,341,042	89.17%
	94	<u>17,615,024</u>	95%
Subtotal		\$ 196,200,958	
	95	18,493,448 ^B	97.5%
	96	19,201,515 ^B	97.5%
	97	17,906,275 ^{B&C}	85%
	98	18,536,691 ^{B&C}	85%
	99	<u>9,556,067^{B&D}</u>	85%
Subtotal		83,693,996	
ITD Total		\$ 279,894,954	

^A Includes three months of PPCA.

^B Funded from the Power Cost Equalization and Rural Electric Capitalization Fund, established in 1993 and capitalized with \$66.9 million.

^C FY97 & FY98 PCE Statistical Reports not yet published. FY98 Amount disbursed is the amount expended as of 2/25/99, including two remaining encumbrances.

^D FY99 Amount disbursed is the sum of invoices processed as of 2/25/98. FY99 legislative appropriation is \$17 million.

MEMORANDUM

State of Alaska Department of Law

TO: D. Randy Simmons
Executive Director
Alaska Industrial Development
and Export Authority

FROM: Keith A. Laufer 
Assistant Attorney General
Governmental Affairs Section, Anchorage

DATE: January 27, 1997

FILE NO:

TEL. NO: 269-5135

SUBJECT: Four Dam Pool

I. INTRODUCTION

Recently there have been developments with respect to the Four Dam Pool projects owned by the Alaska Energy Authority ("AEA"). This memorandum will provide a background with respect to the projects and the existing power sales agreement between the State and the purchasing utilities. In addition, this memorandum will discuss the proposal received from former United States Senator Mike Gravel on behalf of a group of investors, the Energy Group, to purchase the projects.

II. BACKGROUND

A. The Projects and the Power Sales Agreement

The State constructed and acquired the projects constituting the Four Dam Pool in the mid 1980's. The cost of the projects to the State was approximately \$483 million. The Four Dam Pool is owned by AEA and consists of four hydroelectric projects serving five communities. Power from the Tyee Lake project is sold through Thomas Bay Electric Association to the communities of Wrangell and Petersburg. Power from the Swan Lake project is sold to Ketchikan Public Utilities. Power from the Solomon Gulch project is sold to the Copper Valley Electric Association serving the Glennallen and Valdez areas. Finally, power from the Terror Lake project is sold to Kodiak Electric Association. The power from all the projects is sold under the terms of a Long Term Power Sales Agreement (the "PSA") between the purchasing utilities and the AEA. The projects are operated by the individual utilities pursuant to operating agreements between the utilities and AEA.

The PSA was executed in October, 1985 and has an initial term of 45 years; terminating October, 2030. Under the PSA, to the extent the purchasing utilities require power, they are required to first purchase the power produced from the Four Dam Pool. The price of the power is established by a formula in the PSA. Under the formula, the power rate has two components. The first component covers the operating cost of the four projects. For this purpose, operation costs of the four projects are pooled to determine one operating cost component for the entire

Four Dam Pool. The second component of the rate is the "debt service component." The debt service component is somewhat a misnomer as no debt was issued by the State to finance the projects (although funds were loaned from the Department of Commerce and Economic Development to AEA to partially finance the projects). The debt service component is the payment to the State in partial repayment of the State's investment in the projects. The debt service component is determined by reference to a debt service schedule contained in the agreement. The debt service component provides for rate "re-openers" in certain events based on the cost of power in the railbelt. In AEA's view, the likelihood of the next rate re-opener significantly altering the current rate is unlikely.

In fiscal year 1996, the power rate for energy produced by the Four Dam Pool was 6.4 cents per kWh. This rate consists of an operating cost component of 2.4 cents and a debt service component of 4.0 cents. For fiscal year 1996, the debt service component produced a debt service payment of about \$11 million dollars. AEA has estimated that the present value of the debt service payments to the State over the remaining term of the PSA is approximately \$165 million dollars. This amount assumes a discount rate of 7%.

Under the PSA, AEA retains significant liabilities related to the projects. In particular, AEA is responsible for uninsured facility failures, substandard performance, and deficiencies in the reserve and replacement fund. Moreover, the utilities obligation to purchase power is not a "take or pay" obligation. Rather, the utilities only pay for power actually purchased from the projects. While the utilities are required to purchase power first from the Four Dam Pool projects to the extent they require power, if the projects are not producing power for some reason, there is no obligation for the utilities to continue to pay.

The PSA also creates a "self-help right" on the part of the utilities. Under that provision of the PSA, if AEA does not fulfill its obligations regarding repairs to the projects, the utilities may withhold their debt service payment to the State and utilize the funds withheld to perform the necessary repairs.

As part of the 1993 legislation that re-organized AEA, the legislature has pre-allocated the debt service payments that are received from the Four Dam Pool to specific funds. Pursuant to AS 42.45.050, debt service payments made by the Four Dam Pool utilities are to be appropriated by the legislature as follows: 40% to Power Cost Equalization and Rural Electric Capitalization Fund; 40% to the Southeast Energy Fund; and 20% to the Power Project Fund to be used for Statewide energy projects. None of the Four Dam Pool debt service payment has been allocated to AEA to fulfill any of its repair obligations under the PSA, nor has AEA been appropriated any other funds to perform such obligations.

B. Funding of Required Repairs

In March, 1994, it became apparent that significant repairs were required to be made to the Tyee Transmission Line which is a part of the project. In addition, required repairs were identified for

the Terror Lake and Swan Lake projects and for spill prevention controls at the projects. Under the PSA, these repairs were the obligation of the State. Because AEA had no funds with which to make the repairs, the purchasing utilities filed suit against AEA in an effort to invoke their self-help rights under the PSA to withhold their debt service payments and utilize those funds to conduct the required repairs. In settlement of that lawsuit, the State agreed with the utilities that limited self-help would be invoked for fiscal year 1996. Funds withheld by the utilities were used for engineering studies to determine the proper scope of the repairs which were required to the projects. As part of the settlement AEA agreed to enter into discussions with the purchasing utilities regarding the possible transfer of ownership of the projects to the utilities.

In fiscal year 1996, the Administration proposed legislation that would have altered the allocation of revenues from the Four Dam Pool. Under the Administration's proposal, debt service payments would have first been allocated to AEA to pay debt service on debt that would have been issued by AEA to fund the required repairs. The legislature, however, failed to pass the proposed legislation and, as was expected, the utilities elected to utilize their self-help rights to withhold the entire debt service payments for fiscal year 1997 and 1998 in order to fund the necessary repairs. Because of the disruption in the debt service payments, no contributions from the Four Dam Pool will be made in either fiscal year 1997 or 1998 to the Power Cost Equalization and Rural Capitalization Fund, the Southeast Energy Fund, or the Power Project Fund.

C. Divestiture Discussions with Purchasing Utilities

In August 1994, the utilities and AEA agreed to mutually explore the possibility of transferring ownership of the Four Dam Pool projects to the utilities. As part of the settlement of the 1995 litigation with the utilities, AEA agreed that it would continue these discussions with the utilities. Chief of Staff Ayers sent a letter to the utilities which described certain requirements which must be met for the Administration to support a transfer of the projects to the utilities. The requirements were that (1) the PSA remain in effect through the transfer, (2) AEA's duties and obligations under the PSA be completely transferred to a joint utility entity and AEA be fully released from those obligations and duties, (3) the State receive adequate value (to be determined) for the projects, and (4) the transfer be subject to review by the legislature.

Authority staff met with the utilities in several meetings over the course of the period from August, 1995 to February, 1996. Ultimately, these discussions broke down over the proper value to be paid by the utilities for the projects. AEA proposed that the reasonable value of the facilities, assuming the utilities completed, at their own cost, the repairs to the Tyec Transmission Line, was \$84 million. AEA arrived at this purchase price by first discounting to present value the payment stream of the debt service payments that would be made to the State over the remaining term of the PSA. The present value of the payment stream utilizing a 7% discount rate was approximately \$165 million dollars. From this amount, AEA subtracted the estimated cost of AEA's continuing repair and risk obligations under the PSA. To arrive at this number, AEA utilized the results of an engineering and risk analysis prepared for the projects by

Harza Engineering Corporation. This study was jointly directed and funded by the purchasing utilities and AEA.

The utilities rejected AEA's proposal. The utilities indicated that, if they were to be required to complete the Tyee repairs, they believed the value of the projects to be somewhere between \$0 - \$20 million. The primary differences between the State and utility values were that the utilities perceived a high risk that energy loads for the region could significantly decline and that inflation could significantly increase the costs of ownership. In addition, the utilities stated that they believed that any transfer of the project would have to result in an immediate significant rate reduction in the wholesale power rate. The utilities factored in a 1 cent per kWh reduction in rates as part of their review of value.

Because the utility and AEA opinions of value were so disparate, the parties agreed to take a hiatus in the discussions to determine if other approaches were possible. Recently, AEA sent a letter to the utilities indicating that divestiture discussions could be reopened if the discussions looked promising and requesting that the utilities bring forth a new proposal in which to open discussions. The purchasing utilities are meeting in February, 1997 and will be preparing a response and counter proposal to AEA.

III. PROPOSAL FROM FORMER U.S. SENATOR GRAVEL

In September, 1996, the Authority received an unsolicited proposal from Former United States Senator Mike Gravel indicating a desire on behalf of the Energy Group to purchase the Four Dam Pool projects from the State for \$84 million plus additional funds to repair the projects up to a cap of \$100 million. The Authority indicated to Mr. Gravel that AEA was in discussions with the purchasing utilities regarding divestiture and, pending the conclusion of those discussions, that the Authority would not entertain discussions regarding other options. Mr. Gravel took his proposals to the communities themselves and began preliminary due diligence with respect to the projects. To our knowledge, the purchasing utilities, while not receptive to the proposal, have nonetheless been courteous and cooperated with Mr. Gravel's due diligence. In December, 1996, at Mr. Gravel's request AEA staff met with Mr. Gravel. Once again, Mr. Gravel was informed that the Authority would not open discussions or entertain proposals regarding the purchase of the Four Dam Pool until and unless the utilities agreed that AEA entertain such discussions.

Mr. Gravel nonetheless went on to explain his proposal. Under Mr. Gravel's proposal, a new entity would acquire the Four Dam Pool Projects from the State. Ownership of the new entity would be comprised of two ownership groups. The first group would be the lower 48 utility investor group that Mr. Gravel represents. The second group would be a community stock ownership plan ("CSOP") under which utility purchasers in the various communities served by the Four Dam Pool would gain ownership shares. As proposed, the utility investor group would obtain financing for one half of the project purchase price while the trustee of the CSOP would obtain financing for the other half of the purchase price. Under the proposal, the community

stock ownership plan trustee would obtain a guarantee or other financial assistance from the State in order to facilitate the CSOP financing.

An important element of Mr. Gravel's proposal is the termination of the PSA. According to Mr. Gravel, the sale would not be viable unless the PSA were terminated and a new power sales agreement or agreements were entered into. The Energy Group proposal calls for a rate of return to the Energy Group investors of between 12% and 15%. Mr. Gravel indicated that under his proposal the communities would be guaranteed a wholesale power rate of 6.5 cents per kWh for 30 years, the period of the anticipated financing necessary to consummate the purchase. The operational component of that rate, however, would be subject to regular adjustments utilizing an index such as the Consumer Price Index.

Mr. Gravel indicated that the new entity could obtain operational savings by consolidating operational responsibility in the new entity. Mr. Gravel stated that this would likely result in the elimination of a number of jobs. Under the proposal, the new entity would be responsible for compensating those employees whose jobs are eliminated.

Mr. Gravel has commenced efforts in the local communities to increase knowledge about his proposal and has met with various community groups. Mr. Gravel has indicated to AEA that, unless the communities or the utilities come up with some sort of fatal flaw with his proposal, he intended to pursue the proposal with the legislature. I understand that Mr. Gravel has begun his legislative efforts in earnest by engaging several lobbyists on behalf of his investor group.

IV. PURCHASING UTILITY POSITION ON GRAVEL PROPOSAL

The purchasing utilities have sent a letter advising AEA of the utilities' continuing interest in pursuing divestiture discussions with the State. A copy of that letter is attached as Exhibit A. In addition, the utilities have asked AEA to reject the Gravel group's proposal and that AEA negotiate a sale with the utilities. The utilities have indicated that they have numerous objections to the proposal provided by Senator Gravel. It is our understanding that the principle objections are that any savings or profits that could be created by the projects would be shared 50% with Outside investors and that the Energy Group would be a "limited liability" company. In the utilities view, all savings or profits should benefit the communities. In addition, the utilities have stated that it would be difficult, if not impossible to gain the consent of all the communities to any change in the current PSA.

V. CONCLUSION

The proposal submitted by former Senator Gravel focuses attention on the existing structure of the Four Dam Pool and the need to develop a long term plan to put the projects on a sound economic footing. Should you require any additional information, please let me know.

Date **APR 26 1997**

Anchorage
Daily News

Client No. **420A**

The Anchorage Times

Publisher: BILL J. ALLEN

"Believing in Alaskans, putting Alaska first"

Editors: DENNIS FRAULEY, PAUL JENKINS, WILLIAM J. TOBIN

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Gravel's offer for dams adds insult to injury

By LEW M. WILLIAMS JR.

KETCHIKAN -- Rep. Ramona Barnes' resolution calling for the sale of four state dams to the highest bidder accomplished two things. It woke up the communities in the Four Dam Pool and state officials in the Alaska Industrial Development and Export Authority that they must reach agreement on disposal of the projects. And it brought an offer from former Sen. Mike Gravel -- who represents unidentified investors -- to buy the dams for \$84 million.

Barnes, R-Anchorage, is unhappy because the Four Dam Pool projects cost so much compared with what the Southcentral area received for energy projects, and because she perceives a move to give the dams to the communities as a state grant instead of the communities repaying some funds, which could be used in Southcentral.

On the other hand, the Four Dam Pool communities are justifiably angry. Even though more money was spent on the four dams -- Swan Lake, Tyee Lake, Terror Lake and Solomon Gulch -- than was anticipated, there was faulty design which will take another \$20 million to \$30 million to correct.

Here's some of the background:

Back in the early 1980s, when the state was rolling in surplus oil revenue, the Legislature agreed to build the four dams for \$250 million. At the same time, the Railbelt Energy Fund was created with the idea that \$200 million a year would be put into it until the fund reached \$1 billion to finance construction of the Susitna Dam. The Susitna project was abandoned. So was the plan to put more money into the Railbelt Fund.

Democratic legislators from Anchorage led a \$100 million raid on the \$210 million Railbelt Energy Fund for projects other than energy. But Southcentral wasn't left penniless. The \$150 million Redoubt Lake power project and the \$120 million Fairbanks-Anchorage Intertie were constructed with state grants.

The plan was formulated for the state to build the four dams -- Swan Lake for Ketchikan, Tyee Lake for Wrangell and Petersburg, Terror Lake for Kodiak and Solomon Gulch for Valdez and Glenallen. In order to gain Anchorage's sup-



Williams



port, Southcentral lawmakers insisted on what has been called the blackmail clause -- support for the Railbelt Energy Fund and for the Susitna project.

The original idea was that the state would pay for construction of the four dams. The utility companies would pay operation and maintenance.

Because of the huge cost overrun for construction -- what was to cost \$250 million actually cost \$483 million -- the state insisted that the utilities repay a portion of the construction costs. A 45-year payment schedule requires communities to repay at the rate of 4 cents per kilowatt hour with another 2.4 cents going to operation of the projects.

...

Among the clauses in the power sales agreement is a provision that if the state fails to take care of major maintenance, money for major repairs could be taken by the project management committee out of the payments to the state.

The management committee initially paid the state about \$11 million per year under the sales agreement. Of that, \$4 million went to the Power Cost Equalization Program. Barnes says that 20 percent was supposed to go to the Railbelt Energy Program and 40 percent was to stay in the Four Dam Pool for future expansion. The Power Cost Equalization program, by the way, subsidizes diesel fuel costs to small communities to bring their power costs more in line with large towns that have cheaper power sources.

When the four dams were completed, two had serious design problems: Terror Lake and Tyee Lake. It is estimated that fixing the Tyee Lake power line will cost \$17 million and Terror Lake's dam, \$5 million, plus engineering costs. Those are the costs above the regular operation and maintenance paid for by the Four Dam Pool and are an obligation of the state under the power sales agreement.

The state sued the contractors and settled for \$10 million. It took most of the settlement money for its cost of legal action -- so repairs weren't made to the projects. Last year, the projects' management committee notified the state, that it would take the entire \$11 million a year as long as needed to make the required repairs.

That, of course, didn't sit well with Rep. Barnes, because it meant no money from the Four Dam Pool for Power Cost Equalization and the Railbelt.

In 1993, the Legislature rolled the Anchorage Energy Authority into the Alaska Industrial Development and Export Authority. That and the obligation to make \$15 million in major repairs, led the state to start negotiating with the Four Dam Pool members to get rid of the dams and get out of the business. The management committee spent \$300,000 for an appraisal of the system, which was valued at \$84 million.

Then, former Sen. Mike Gravel comes in and offers to buy the four dams from the state for \$84 million. His company is called Citizens Power of Alaska. It proposes that the Four Dam Pool communities own 50 percent. He is promising to reduce operating costs.

It is unclear how bringing in private investors, who will expect a return on their investment, will give better rates than can the public utilities. What Gravel proposes is to buy the cream off the top. It probably would mean an end to the Swan Lake-Tyee Lake Intertie and other future interties and power generation expansion, because investors would be more interested in maximizing financial returns.

This would add more insult to the injury. The injury of terrible cost overruns. The injury caused by failure to correct major problems. The injury of selling out cheap to contractors and engineers on faulty design.

Lew M. Williams Jr. is former editor and publisher of the Ketchikan Daily News.

ALASKA ENERGY AUTHORITY
(a Component Unit of the State of Alaska)

Notes to Financial Statements

June 30, 1998 and 1997

(1) Organization and Operations

The Alaska Energy Authority (AEA) was created by the Alaska State Legislature in 1976. AEA is a public corporation and a component unit of the State of Alaska (State). AEA's mission is to promote, develop, and advance the general prosperity and economic welfare of Alaskans by providing a means to operate and maintain existing power projects that tap Alaska's natural resources to achieve the lowest reasonable consumer power costs.

Throughout the 1980's, AEA worked to develop the State's energy resources as a key element in diversifying Alaska's economy. A number of large-scale projects were constructed. Today, AEA's six hydroelectric projects have an installed capacity of 164 megawatts, and the Alaska Intertie's 170 miles of transmission line link Interior Alaska with the cheaper energy available in the Southcentral portion of the State.

Pursuant to statute, on August 12, 1993, the Board of Directors of the Alaska Industrial Development and Export Authority (AIDEA), a public corporation and a political subdivision of the State, became the Board of Directors of AEA. Concurrently, the Executive Director of AIDEA was also appointed as Executive Director of AEA. The corporate structure of AEA was retained but the ability to construct and acquire energy projects was eliminated. AEA retained its operating assets including the Four Dam Pool (Solomon Gulch, Swan Lake, Terror Lake and Lake Tyee Hydroelectric Projects), the Bradley Lake Hydroelectric Project, the Alaska Intertie and the Larsen Bay Hydroelectric Project. The intent of the legislation was that ongoing operation of the operating assets be assumed by the electric utility companies that use or purchase power from the assets with oversight responsibility retained by AEA; this has occurred to the extent possible.

The following is a description of AEA's existing projects:

Bradley Lake Hydroelectric Project

The project has installed capability of 126 megawatts and transmits its power to the State's main power grid via two parallel 20-mile transmission lines. The project, which cost in excess of \$300 million, went into commercial operation in 1991. The project is now operated by Homer Electric Association under contract with AEA. Bradley Lake serves Alaska's Railbelt from Homer to Fairbanks as well as the Delta Junction area.

 Four Dam Pool Project

The Solomon Gulch, Swan Lake, Terror Lake and Lake Tyee Hydroelectric projects, collectively known as the Four Dam Pool, came on line in the 1980's and serve, respectively, the communities of Valdez and Glennallen, Ketchikan, Kodiak, and Petersburg and Wrangell.

(Continued)

ALASKA ENERGY AUTHORITY
(a Component Unit of the State of Alaska)

Notes to Financial Statements

The project gained its name from the fact that all costs are pooled, with the same kwh rate charged for electricity drawn from any one of the four projects. The local utilities are responsible for day-to-day operation of the projects.

Alaska Intertie

The 170-mile, 345-kilovolt transmission line interconnects the power distribution systems of Anchorage and Fairbanks. The Alaska Intertie allows Golden Valley Electric Association in Fairbanks to purchase electricity produced with lower cost energy, such as natural gas and hydroelectric, from the Anchorage and Kenai Peninsula utilities. The Alaska Intertie reduces the number of black/brownouts throughout the system. Operations and maintenance duties are overseen by the Intertie Operating Committee.

Larsen Bay Hydroelectric Project

The 475-kilowatt project went into commercial operation in mid-1991. In addition to producing electricity for this isolated Kodiak Island community, the project replaced the City of Larsen Bay's old water supply system and provides a better source of water with reduced maintenance and improved water quality. The City of Larsen Bay operates the project.

(2) Summary of Significant Accounting Policies

Basis of Accounting - Enterprise Fund Accounting

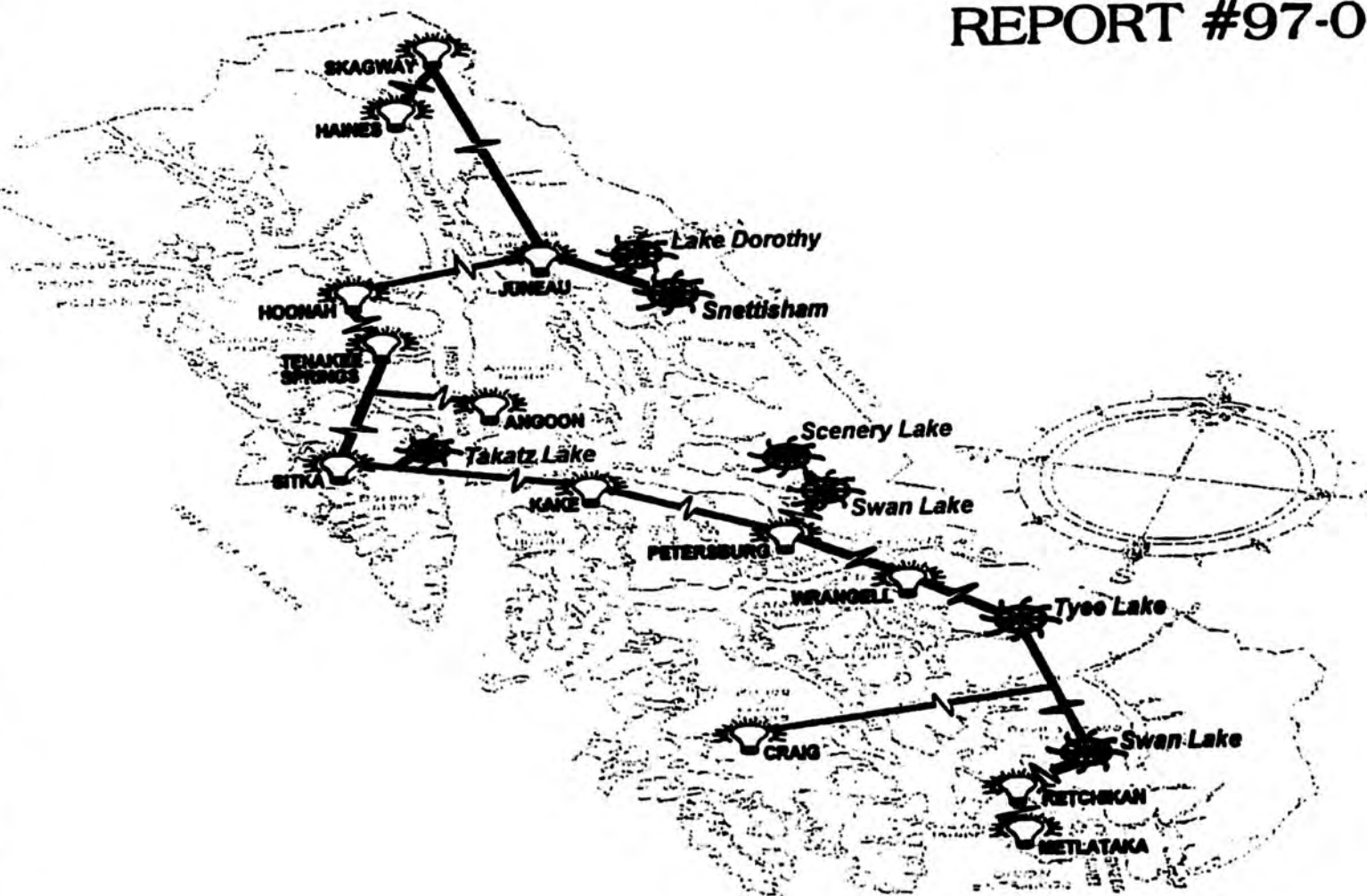
The accounts of AEA are organized as an Enterprise Fund. Accordingly, the financial activities of AEA are recorded using the accrual basis of accounting, whereby revenues are recorded when earned and expenses are recorded when goods or services are received or the related liability is incurred.

Statement Number 20 of the Government Accounting Standards Board (GASB), Accounting and Financial Reporting for Proprietary Funds and Other Governmental Entities That Use Proprietary Fund Accounting, provides two options for reporting proprietary fund activities (including component units using proprietary fund accounting). AEA has elected to apply all applicable GASB pronouncements and all FASB Statements and Interpretations, Accounting Principles Board Opinions and Accounting Research Bulletins issued on or before November 30, 1989, unless they conflict with or contradict GASB pronouncements.

(Continued)

Southeast Alaska Electrical Intertie System Plan

REPORT #97-0





23 January 1998

Mr. Berne C. Miller
Executive Director
Southeast Conference
213 Third Street, Suite 124
Juneau, Alaska 99801

Dear Berne:

**Southeast Alaska Electrical Intertie System
Transmittal of Final Report # 97-01**

We are pleased to provide this final report to the Southeast Conference and the Participants in the proposed Southeast Alaska Electrical Intertie SYSTEM. It has been a privilege and an honor to work with you and representatives of the participating municipalities and utilities on this assignment. We are grateful for this opportunity and we sincerely wish you and the communities who will benefit from an interconnected electrical system our very best as you take the vision that is presented in this report forward to reality. We would be honored to continue to serve the region and look forward to a continuing relationship with you.

Yours very truly,

A handwritten signature in dark ink, appearing to read "Nan A. Nalder".

Nan A. Nalder
Project Manager

enc.

ACRES INTERNATIONAL CORPORATION

3254 Eleventh Avenue West, Seattle, Washington 98119
Telephone 206-281-7089 Facsimile 206-213-0652 Email sea@acres.com

Southeast Alaska Electrical Intertie System Plan

REPORT #97-01

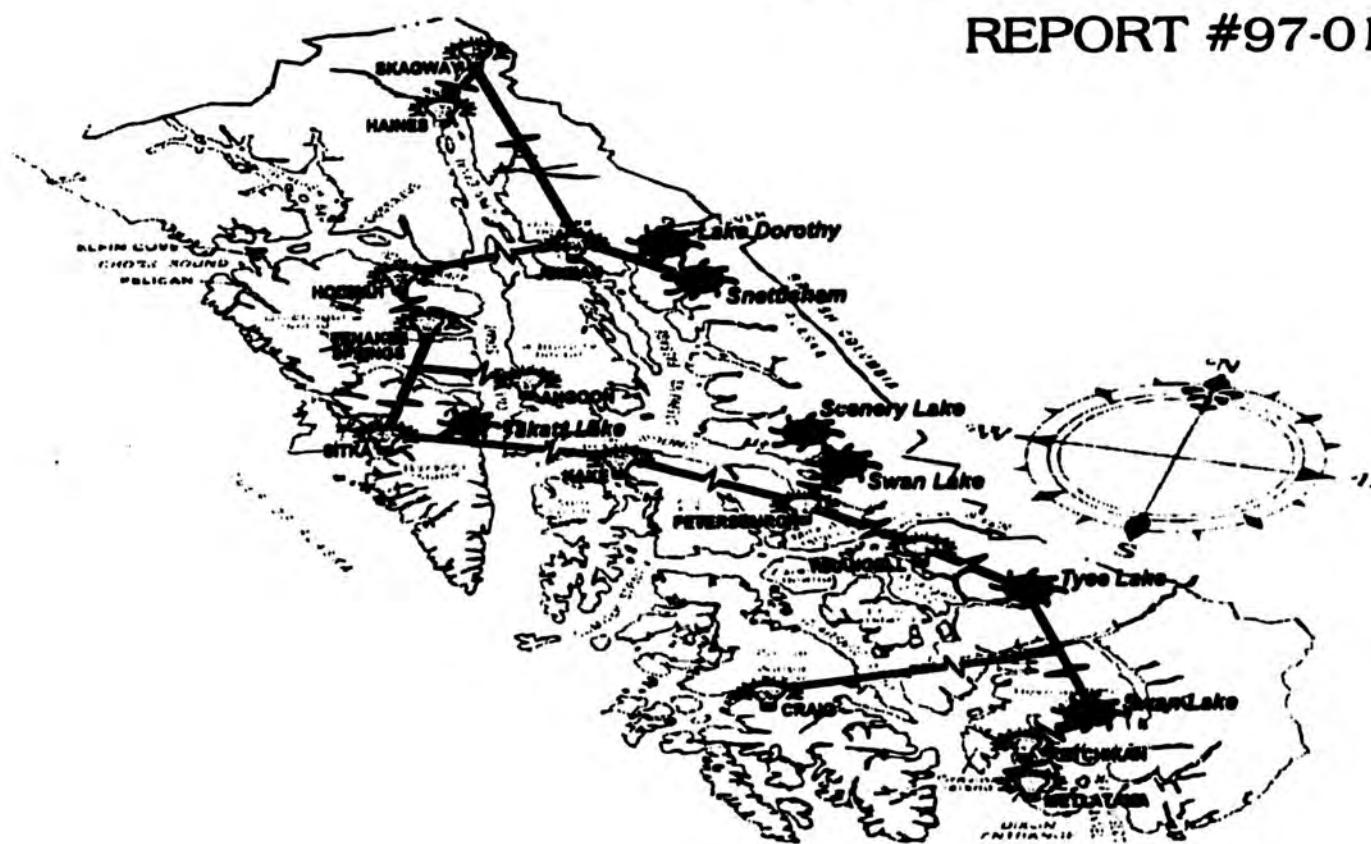


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Executive Summary

The purpose of this report is to present technical information in support of a proposed electrical intertie system to interconnect presently remote isolated load centers; increase system reliability; reduce or avoid diesel dependence; encourage economic development; and stabilize and equalize power rates. This report presents a proposed SYSTEM Plan to assess final feasibility; prepare detailed design and construction documents; and construct and operate an integrated electrical intertie system in Southeast Alaska.

"The communities of Southeast Alaska support the concept of a southeast electric grid as a means of reducing or avoiding diesel dependence, encouraging economic development and stabilizing and equalizing power rates. The communities intend to prioritize the development of a regional intertie system, in accordance with individual communities' power needs. The next step is to seek the necessary funding on a partnership basis with the state and federal governments." ("White Paper", July 1997, as revised in December 1997)

Southeast Alaska is comprised of thousands of islands known as the Alexander Archipelago. The region offers significant natural resources and a quality of life conducive to attract new clean economic development to the area. With few exceptions, no roads or bridges connect islands. People travel between islands by boat, floatplane, and/or wheeled plane. Current limitations imposed by a lack of infrastructure and related availability of low-cost clean energy restrict development of economic development and related improvement in basic quality of life in the participating Southeast Alaska communities. The participants have determined that an integrated electrical transmission grid will enhance delivery of reliable and low-cost electric service; and support development of an integrated energy, communications, and transportation infrastructure to serve regional needs and attract new economic opportunities to the region.

The communities, acting through the Southeast Conference, contracted with Acres International Corporation (Acres) to prepare a Southeast Alaska Electrical Intertie SYSTEM Plan (SYSTEM Plan) that integrates development of proposed intertie segments with new hydroelectric generation capacity designed to serve the needs of the region. The SYSTEM Plan provides a "living" plan that can be updated as the participants proceed through development of the SYSTEM.

Participating entities include: Alaska Electric Light and Power Company (AEL&P), Alaska Power & Telephone Co. (AP&T); City and Borough of

Executive Summary

- ▶ The ability to attract new industry and to modernize traditional industry is dependent on enhanced telecommunications, fibre optic networks, internet access, and efficient transportation systems.
- ▶ Existing hydroelectric projects are inadequate to serve future growth; isolated load centers will site additional diesel generation to meet immediate needs.
- ▶ Communities need reliable, cost effective, long-term sources of energy for the future that provide stable electric rates and employment and reduce environmental impacts within the region.

One of the critical issues facing the Participants is availability of adequate funds to Completing to support the level of professional engineering and construction services and related physical features to construct the proposed intertie SYSTEM. Participants recognize that a combination of State, Federal, and Community funding will be required. Communities and utilities would finance new generation facilities. Regional electric utilities will operate and maintain SYSTEM transmission facilities. Sources of potential private investment will also be explored.

The central policy question regarding future generation in Southeast Alaska is whether it is better to continue to develop many load-specific small hydropower projects and additional diesel generation units, or to develop a long-term collective solution to meet future energy demand with larger regional hydropower plant that develop the generation potential of sites with fewer cumulative environmental impacts. Alaskans are interested in protecting air quality and are therefore reluctant to continue to add fossil-fuel-fired generation in highly scenic areas that draw tourists from around the globe and provide a significant source of revenue to local communities. Developing regional power projects to meet future demand will require a regional grid.

Normally, the phasing of hydroelectric projects within a power system grid is based largely on the estimated cost of each respective potential project. By nature, hydroelectric projects are capital cost intensive and are generally very site specific. The selected new projects have very similar characteristics consisting of lake taps at perched lakes with tunnels of reasonable length leading to powerhouses at tidewater. Therefore, development costs can be expected to be comparable and consistent with others recently developed in the region.

Accordingly, it is appropriate to phase project development on the basis of projected needs for the intertie itself coupled with due consideration to the load

Executive Summary

others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

Phase III

Construct interties connecting Angoon, Tenakee Springs, Hoonah, Green's Creek and Juneau to Sitka, Kake, Petersburg, Ketchikan and Metlakatla (North-South Grid). At this point the load growth for Juneau becomes the major factor in determining the needs of the interconnected system. If mining loads develop during the next few years, Lake Dorothy may be brought on-line before 2015. Further, based on the load growth as projected for Juneau, the system loads can also fully utilize the proposed Swan Lake project within the 2015 - 2020 time frame. Preliminary cost estimates for development of intertie segments specified during Phase III are \$173,788,000/1996\$ for the Tenakee Springs/Angoon/Hoonah/Greens Creek/Juneau Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

Phase IV

Construct interties connecting Skagway, Haines, and Kensington to North-South Grid. Construct Takatz Lake Hydropower Project. By 2020, either the Takatz Lake project or the Scenery Lake project could be added to the system. Takatz Lake is shown on Figure 2 as a part of Phase IV on the basis of the proposed road interconnection from Warm Springs and the transmission system to Sitka as factors in reducing the environmental effects and cost of development. Preliminary cost estimates for development of intertie segments specified during Phase IV are \$79,160,000/1996\$ for the Juneau - Skagway Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

Phase V

Construct intertie connecting Prince of Wales Island to North-South Grid. With this addition in 2025, the cumulative load projections of the respective communities indicate that the output of Scenery Lake would be fully utilized in its first year of operation. Preliminary cost estimates for development of intertie segments specified during Phase V are \$39,089,000/1996\$ for the Ketchikan - Prince of Wales Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

The general evolution of analyses presented in the 1987 Intertie Study is entirely appropriate for the purpose of progressively narrowing down the options to find the optimal development sequence. However, we identified a

Executive Summary

Proposed Sequencing and Cost Estimates for Southeast Alaska Transmission Grid Segments

PHASE	NEW LINE SEGMENTS	LOAD CENTERS
I	Swan Lake - Lake Tye (KPU, Initial Draft Power Supply Planning Study, 1996) 57 mi 138-KV line connects Swan-Tye hydro Status: Final EIS/ USFS Record of Decision issued 8/97. Construction bids to be requested in late 1997. Estimated cost: \$69,772,000/1996\$	Petersburg, Wrangell & Ketchikan
I	Ketchikan - Metlakatla (Alaska Power Authority, Southeast Alaska Transmission Intertie Study, 1987) 15 mi 34.5 KV line (14 mi OH / 1 mi submarine) Connect KPU's Mountain Point Sub / Race Point, MP&L. Status: Final documents to be prepared once Swan-Tye line is under construction. Estimated cost: \$8,785,000/1996\$*	Petersburg, Wrangell, Ketchikan & Metlakatla
II	Petersburg - Kake - Sitka II-A - Petersburg - Kake (DCRA, Division of Energy, Kake-Petersburg Intertie Feasibility Study, 1996) 46.7 mi 69 KV (44.3 mi OH / 2.4 mi submarine) capable of upgrade to 138 KV. Status: 1996 update to 1987 appraisal level engineering / environmental review. Estimated cost: \$19,734,600/1996\$ II-B - Kake - Sitka (Alaska Power Authority, Southeast Alaska Transmission Intertie Study, 1987) 55.4 mi 138 KV (20.2 mi OH / 35.2 mi DC submarine) cable Status: Reconnaissance engineering / environmental. Estimated cost: \$45,489,000/1996\$*	Sitka, Kake, Petersburg, Wrangell, Ketchikan & Metlakatla
III	Sitka - Tenakee Springs/Angoon - Hoonah - Greens Creek - Juneau (Alaska Power Authority, Southeast Alaska Transmission Intertie Study, 1987) 148.6 mi 138 KV (120.8 mi OH / 27.8 mi AC submarine) Status: Appraisal level engineering / environmental review. Estimated cost: \$173,788,000/\$1996\$*	Sitka, Angoon, Tenakee Springs, Hoonah, Greens Creek, Juneau to Petersburg, Wrangell, Ketchikan, Metlakatla (North-South Grid)
IV	Juneau - Skagway (Alaska Power Authority, Haines-Skagway Region Feasibility Study, 1981) 70.5 mi (6.5 miles 69 KV OH / 64 miles 100 KV DC submarine) Status: Appraisal level engineering / environmental review. Estimated cost: \$79,160,000*	Connects Skagway, Haines, and Kensington, north of Juneau, to North-South Grid
V	Ketchikan - Prince of Wales Island (Alaska Power Authority, Black Bear Feasibility Report, 1981) 19 mi 69 KV or 115 KV (1 mi OH / 18 mi submarine) Status: Appraisal level engineering / environmental review. Estimated Cost: \$ 39,089,000*	Connects Thorne Bay, Kasan, Klawock, Hollis, Craig, and Hydaburg to North-South Grid
SYSTEM TOTALS	243.8 mi OH / 148.4 mi submarine 392.2 total miles Construction Cost Estimate \$435,817,000/1996	

* Indicates cost prepared using standard cost curves to escalate earlier estimate.

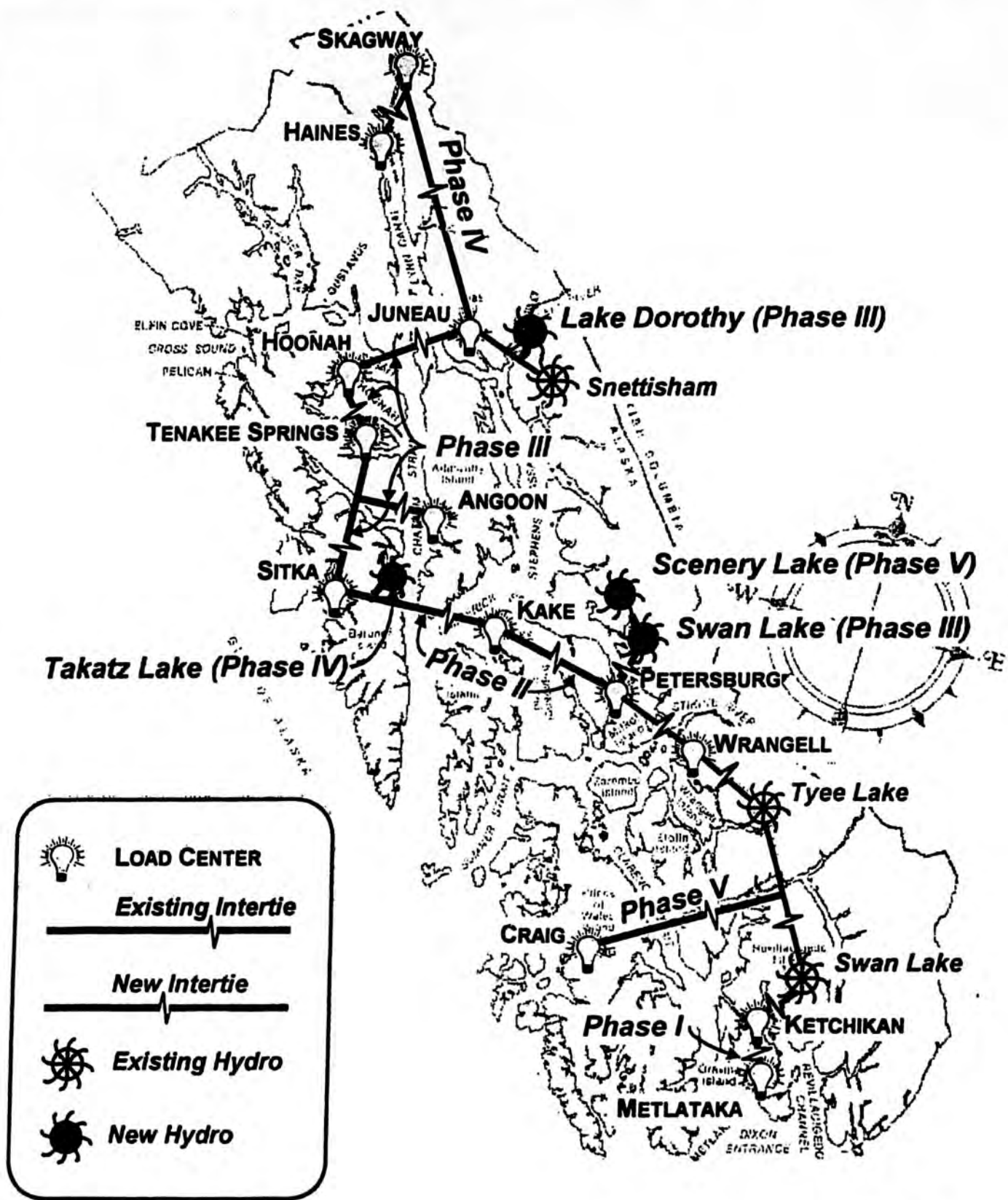


Figure 1

Southeast Alaska Utilities
ELECTRICAL INTERTIE SYSTEM PLAN



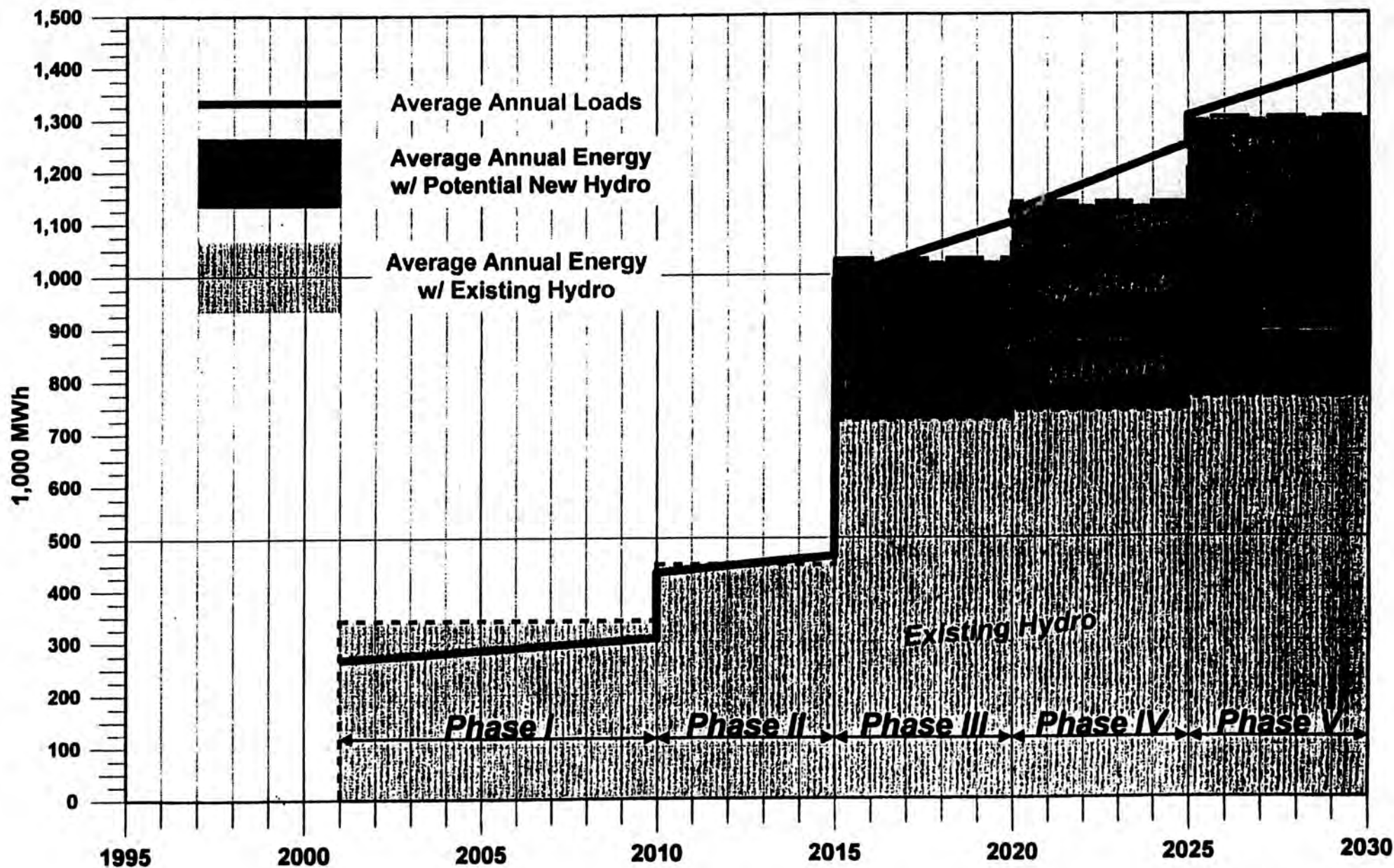


Figure 2



**“White Paper” Prepared
by Participants**

"White Paper" Prepared by Participants

Representatives from communities in Southeast Alaska met during 1997 with the purpose of preparing a "white paper" on regional power generation and distribution needs. The white paper focus is on a regional power grid development plan for Southeast Alaska that is responsive to each community's needs and time lines.

The Southeast Conference, an Alaska Regional Development Organization and USDA Resource Conservation and Development Council, issued a request for proposals to provide professional engineering services to update and summarize information contained in the Southeast Alaska Electrical Intertie & Transportation Corridors Study and other related documents on June 20, 1997. Acres International Corporation (Acres) was awarded a contract on August 5, 1997 to undertake this effort. The white paper set the tone for this assignment and one of the requirements in the RFP was to "Review paper and recommend changes needed to make paper agree with results of this effort." (Section Four, Scope of Work, 4.2 Approach, item 1, RFP # 97-01)

The July 1997 White Paper focused on a 20-year regional power grid development plan. An initial draft of the report was presented to participants and discussed at the September 1997 Southeast Conference Annual Meeting in Petersburg. Following that meeting, participants provided additional comments and also discussed the appropriate schedule for phasing development of the regional power grid. During a December 1997 meeting in Sitka, participants determined that the plan should not be limited to a 20-year horizon as full realization of the proposed plan could extend beyond a period of 20 years and participants determined that a flexible timeframe was more appropriate. Acres revised the original draft of the report to address this change in timeframe. The July 1997 White Paper was revised accordingly and following this brief introductory section, readers will find a copy of the December 1997 version of the White Paper with recommended changes as approved by the participants. A list of participating communities is included at the end of the text. Copies of resolutions passed by participating communities are available upon request from the Southeast Conference.

WHITE PAPER

SOUTHEAST ALASKA ELECTRICAL INTERTIE SYSTEM

July 1997, as Revised December 1997

Major economic and social changes are taking place in Southeast Alaska to minimize adverse impacts of those changes, and to facilitate economic revitalization and diversification, adequate infrastructure is a must.

The most basic of infrastructure is electricity, because without adequate generation and transmission capacity, communities will be unable to sustain services, let alone grow. Even other infrastructure, such as water and sewer facilities, is dependent on electricity. Moreover, from an environmental impact standpoint, failure to construct a regional electric grid will result in increased local diesel generation rather than taking advantage of the substantial hydro power potential that exists in Southeast Alaska. Building a generation and intertie grid takes a long time, so a regional construction plan is needed now.

In 1987, the then Alaska Power Authority completed a study that identified a Southeast Alaska electrical grid system. The study found that such a grid is both technically and economically feasible, with a twenty year planning horizon. Today, after a decade of growth in demand and numerous studies confirming the need for this network, virtually none of these electrical interties have been constructed. Last month, the communities of Southeast Alaska came together in Sitka to start getting the job done. The group initiated efforts to develop a plan drawing heavily on work in the previous intertie studies.

At present, most every community in Southeast Alaska generates its own power in a largely isolated electrical environment. In an area with rich hydroelectric potential, most smaller communities remain entirely diesel dependent. Even in larger communities such as Juneau, Ketchikan and Sitka which currently have hydroelectric power, those facilities are reaching the limit of their capacity and supplemental diesel power is being pursued or contemplated. This, despite the fact there is adequate hydroelectric potential to serve all of Southeast for decades to come if an intertie system existed to transport power to the load centers.

The communities of Southeast Alaska therefore support the concept of a southeast electric grid as a means of reducing or avoiding diesel dependence, encouraging economic development and stabilizing and equalizing power rates. The communities intend to prioritize the development of a regional intertie system, in accordance with individual communities' power needs. The next step is to seek the necessary funding on a partnership basis with the state and federal governments.

Participants Supporting a Regional Effort to Promote a 20-Year Power Grid Plan for the Southeast Alaska Region include:

- ▶ Alaska Electric Light and Power Company
- ▶ Alaska Power & Telephone Co.
- ▶ City and Borough of Juneau, Alaska
- ▶ City of Kake
- ▶ City of Ketchikan
- ▶ Ketchikan Public Utilities
- ▶ Metlakatla Power & Light
- ▶ City of Petersburg
- ▶ City and Borough of Sitka
- ▶ Tlingit & Haida Regional Electrical Authority
- ▶ City of Wrangell

Purposes and Objectives

Section 2

Purposes and Objectives

"The communities of Southeast Alaska support the concept of a southeast electric grid as a means of reducing or avoiding diesel dependence, encouraging economic development and stabilizing and equalizing power rates. The communities intend to prioritize the development of a regional intertie system, in accordance with individual communities' power needs. The next step is to seek the necessary funding on a partnership basis with the state and federal governments." ("White Paper", July 1997, as revised December 1997).

The communities, acting through the Southeast Conference, contracted with Acres International Corporation (Acres) to prepare a Southeast Alaska Electrical Intertie SYSTEM Plan (SYSTEM Plan) that integrates development of proposed intertie segments with new hydroelectric generation capacity designed to serve the needs of the region. The SYSTEM Plan provides a "living" plan that can be updated as the participants proceed through development of the SYSTEM.

Participating entities include: Alaska Electric Light and Power Company (AELP), Alaska Power & Telephone Co. (AP&T); City and Borough of Juneau; City of Kake; City of Ketchikan; Ketchikan Public Utilities (KPU); Metlakatla Power & Light (MP&L); City of Petersburg / Petersburg Municipal Power & Light (PMP&L); City and Borough of Sitka, Tlingit & Haida Regional Electrical Authority (THREA); and City of Wrangell. Copies of Resolutions in support of the Intertie System are included in Appendix A.

This report documents investigations and analyses conducted by Acres under the terms of the August 5, 1997 Letter of Agreement with the Southeast Conference pursuant to the Request for Proposals #97-01, Southeast Electrical Intertie, as augmented in January 1998.

2.1 Purpose

The purpose of this report is to present technical information in support of a proposed electrical intertie system to interconnect presently remote isolated load centers; increase system reliability; reduce or avoid diesel dependence; encourage economic development; and stabilize and equalize power rates. This report presents a proposed SYSTEM Plan to assess final feasibility; prepare detailed design and construction documents; and construct and operate an integrated electrical intertie system in Southeast Alaska. This report will be used to brief legislators, Members of Congress, and other public officials; and to inform residents in the communities and elicit their support for the proposed Southeast Alaska Electrical Intertie SYSTEM.

Purposes and Objectives

In preparing this report, Acres interviewed federal and state energy officials; community leaders; and electric utilities to elicit their interests and recommendations and identify studies and plans that have been completed. Studies and plans used in preparing this report are identified in the text. A complete bibliography is included at Appendix B, Volume 2 and is available from the Southeast Conference.

2.2 Objectives

Develop a 20-year power grid plan for the Southeast Alaska Region responsive to each community's needs and time lines that will enhance opportunities to increase the region's economic base and result in regional economic development opportunities that will provide a basis to achieve:

- effective and efficient coordination of the electrical resources and enhanced reliability of electrical service through a regional power grid;
- clean renewable hydroelectric regional energy resources, thereby avoiding increased environmental effects associated with additional diesel generation;
- an environment that will enhance opportunities to locate new commercial and industrial business;
- lower cost hydroelectric power to communities now solely dependent on diesel generation, thereby increasing opportunities to attract new business and provide jobs to communities with high unemployment; and
- stable electric rates and cost equalization.

**Approach and Proposed
System Development Phasing**

Approach and Proposed System Development Phasing

The State of Alaska and the Federal Government have conducted numerous reconnaissance level investigations and identified potential sites and corridors for the development of hydroelectric power generation facilities and electrical power grids throughout Southeast Alaska. This report draws on the content of existing documents and, where necessary, includes updates to existing data based on Acres' experience with similar projects. Original research and analysis were not part of this assignment. Our purpose in developing this plan was to confirm feasibility of a regional electrical intertie SYSTEM and to identify logical steps to pursue development of grid segments and regional hydroelectric generation facilities.

We interviewed leaders in a number of municipalities and utilities to identify existing studies and plans, and discussed their vision and expectations for an integrated regional electrical system. Based on these interviews, we understand that the participants seek a flexible plan that presents logical steps to take to get from here – a set of preliminary documents – to an interconnected electrical system that will serve the region's needs from a number of perspectives. Data was requested of each municipality and utility in the region regarding power generation and distribution needs, and plans and load forecasts.

Based on our interviews and information provided by the participants, review of existing documents, and our analyses, we present this proposed SYSTEM Plan in five phases:

Phase I 1995 - 2010

Construct interties connecting Swan Lake and Tyee Lake hydroelectric projects to KPU's electrical system; and construct an intertie connecting MP&L to KPU's electrical system.

Phase II 2011 - 2015

Construct interties connecting Sitka and Kake to Petersburg, Ketchikan and Metlakatla.

Phase III 2016 - 2020

Construct interties connecting Angoon, Tenakee Springs, Hoonah, Green's Creek and Juneau to Sitka, Kake, Petersburg, Ketchikan and Metlakatla (North-South Grid). Construct Lake Dorothy and Swan Lake hydropower projects.

Approach and Proposed System Development Phasing

Phase IV 2021 - 2025

Construct interties connecting Skagway, Haines, and Kensington to North-South Grid. Construct Takatz Lake Hydropower Project.

Phase V 2026 - 2030

Construct intertie connecting Prince of Wales Island to North-South Grid. Construct Scenery Lake Hydropower Project.

Section 7 of this report presents further details of the proposed SYSTEM and includes two figures which provide the following graphic representations.

Figure 1, Southeast Alaska Utilities ELECTRICAL INTERTIE SYSTEM PLAN, presents a map of Southeast Alaska with a schematic diagram superimposed to depict load centers, existing and proposed new interties, and existing and proposed new hydroelectric generation facilities. **Figure 2, Southeast Alaska Utilities ELECTRICAL INTERTIE SYSTEM PLAN: LOADS AND RESOURCES** presents a schematic diagram showing phasing of new generation as loads grow and the transmission intertie SYSTEM is constructed.

Detailed Technical Analyses and Cost Information Appendices are available upon request from the Southeast Conference.

Need for System

Section 4

Need for System

4.1

Demographics and Local Economy

Southeast Alaska is comprised of thousands of islands known as the Alexander Archipelago. The region offers significant natural resources and a quality of life conducive to attract new clean economic development to the area. With few exceptions, no roads or bridges connect islands. People travel between islands by boat, floatplane, and/or wheeled plane. Current limitations imposed by a lack of infrastructure and related availability of low-cost clean energy restrict development of economic development and related improvement in basic quality of life in the participating Southeast Alaska communities. The participants have determined that an integrated electrical transmission grid will enhance delivery of reliable and low-cost electric service; and support development of an integrated energy, communications, and transportation infrastructure to serve regional needs and attract new economic opportunities to the region.

Southeast Alaska electric utilities currently operate isolated systems. Lacking transmission interconnections to other electric systems, each utility must plan independently to provide full power requirements to meet customer needs. Developing hydropower generation and major transmission projects requires a long lead time and significant capital investment.

Population growth in Southeast Alaska has increased from approximately 65,000 to 75,000 persons over the ten year period 1986 - 1996. Annual average employment increased during the ten year period from 29,000 to 36,000 persons. During this period the real average annual salary declined from \$34,000 to \$30,000 and total payroll increased from \$1 billion to \$1.1 billion. Government accounts for over \$800 million in annual personal income in Southeast Alaska. (McDowell Group, Inc., 1997)

The three main load centers in the region are Juneau, Sitka, and Ketchikan. Expansion of transmission grid legs as presented in the 1997 Report focused on these three load areas. Recent trends for several of the participating utilities are presented in a table following this text section.

The Southeast Alaska economy is built on timber, fishing, and tourism. An increase in hardrock mining development is proposed, but as yet is not a major factor. Communities are investigating "value-added" timber and fishery products in order to expand these traditional industries. New industrial development is being actively sought, however absence of an interconnected electric system and improved transportation tends to discourage significant investment in the region. (AEA 1990).

Need for System

Table 4.1
Private Sector Industry
Trends in Southeast
Alaska 1990 - 1996

Private Industry Sector	Change Since 1990	Change 1995 - 1996
Construction	+ 600	+ 150
Lumber & Wood Products	- 1,300	+ 300
Seafood Processing	+ 50	- 150
Transportation	+ 200	No Change
Retail Trade	+ 1,200	+ 100
Services (ex. transportation)	+ 3,750	+ 350

Source: Presentation Materials prepared by McDowell Group, Inc., for the Southeast Conference Annual Meeting, September 18 - 20, 1997

Table 4.2
Government Employment
Trends - Southeast
Alaska 1990 - 1996

Level	Change Since 1990	Change 1995 - 1996
Federal	- 100	No Change
State	- 250	- 50
Local	+ 450	+ 150

Source: Presentation Materials prepared by McDowell Group, Inc., for the Southeast Conference Annual Meeting, September 18 - 20, 1997

Table 4.3
Recent Population and
Local Employment
Trends for Selected
Southeast Alaska
Communities

Phase / Community	1997 Population	% Change Population 96-97 Employment 95-96		1990-97 % Change Population	Actual Population Growth
I / Ketchikan	14,599	pop emp	-0.9% -1.1%	0.8%	771
I / Petersburg	3,432	pop emp	2.3% -2.3%	pop 1.0%	225
I / Wrangell	2,543	pop emp	-2.0% -2.3%	0.3%	64
I / Metlakatla	1,595	pop emp	0.5% NA	NA	NA
II / Kake	767	pop emp	7.7% NA	NA	NA
II / Sitka	8,733	pop emp	1.2% 1.2%	0.2%	145
III / Juneau	29,813	pop emp	1.0% 2.2%	1.6%	3,062
III / Angoon	571	pop emp	-5.6% -5.7%	NA	NA
III / Hoonah	906	pop emp	0.7% -5.7%	NA	NA
IV / Skagway	816	pop emp	6.4% -5.7%	NA	NA
IV / Haines	2,421	pop emp	2.0% 9.6%	1.9%	304
V / Craig	2,043	pop emp	-3.1% -0.3%	7.0%	783
V / Klawock	704	pop emp	-3.0% -0.3%	NA	NA
V / Thorne Bay	625	pop emp	-3.1% -0.3%	NA	NA

Sources: Presentation Materials prepared by McDowell Group, Inc., for the Southeast Conference Annual Meeting, September 18 - 20, 1997

Need for System

- Communities need reliable, cost effective, long-term sources of energy for the future that provide stable electric rates and employment and reduce environmental impacts within the region.

4.2

Financing the SYSTEM

One of the critical issues facing the Participants is availability of adequate funds to Completing to support the level of professional engineering and construction services and related physical features to construct the proposed intertie SYSTEM. Participants recognize that a combination of State, Federal, and Community funding will be required. Communities and utilities would finance new generation facilities. Regional electric utilities will operate and maintain SYSTEM transmission facilities. Sources of potential private investment will also be explored.

In support of its proposed request for federal support, the Participants state that Southeast Alaska and its residents have borne a significant burden due to federally imposed limitations on development of the State's natural resources pursuant to Federal Legislation. These limitations have resulted in significant reductions in traditional timber and fishing industries and related reductions in local employment as discussed in the above section 4.1, Demographics and Local Economy.

4.3

Joint Regional Planning and Implementation

The existing electric transmission facilities in Southeast Alaska are a collection of remote communities solely dependent on their own resources to meet load. With the exception of existing connections between Petersburg and Wrangell there are no interconnections to import or export power among Southeast Alaska communities and electric utilities. The planned intertie between Swan Lake and Lake Tyee will add Ketchikan to the Petersburg/Wrangell interconnection. AP&T also plans to interconnect Skagway and Haines in 1998.

The opportunity to develop a regional system through joint planning will avoid the need to come in later and try to fix problems similar to those inherent in the interconnected systems in the "lower 48". Joint planning and system operation will facilitate open access to regional SYSTEM facilities at fair and non-discriminatory rates. SYSTEM ownership could be available to all interested parties - utilities, municipalities, independent power project owners, and large industrial customers. Users of the SYSTEM would fund operation and future improvements. Joint ownership and operation would reduce the potential for monopoly control and related potential discrimination, and related costly lengthy litigation regarding alleged abuse of monopoly power, that have restricted efficient use of existing facilities in the "lower 48." Southeast Alaska provides an opportunity to "do it right" the first time by facilitating development that requires joint planning and operation.

Need for System

4.4

Future Electric Generation Resource Development

The central policy question regarding future generation in Southeast Alaska is whether it is better to continue to develop many load-specific small hydropower projects and additional diesel generation units, or to develop a long-term collective solution to meet future energy demand with larger regional hydropower plant that develop the generation potential of sites with fewer cumulative environmental impacts. Alaskans are interested in protecting air quality and are therefore reluctant to continue to add fossil-fuel-fired generation in highly scenic areas that draw tourists from around the globe and provide a significant source of revenue to local communities. Developing regional power projects to meet future demand will require a regional grid.

4.5

Future Growth and Need for Improved Services in Southeast Alaska

Communities need to improve services to attract new commercial and industrial development to expand employment opportunities in an area where the traditional logging, pulp, and fishing industries are in decline. A key element is stabilizing electric rates so that communities are not disadvantaged due to lack of access to hydropower generation. Competitive electric rates are essential to local regional development.

The transmission infrastructure needs to be linked with development of improved transportation to and within Southeast Alaska. Improved access will attract new product-oriented industry, improve tourism opportunities, enhance interaction between communities in Southeast Alaska, and generally improve the lifestyle of residents by enabling them to travel for business and personal needs on a reliable and timely basis.

A regional dedicated utility corridor could accommodate regional and energy transmission/transportation (electricity, fibre optics, and natural gas) and multi-modal transportation. This report addresses electricity transmission and notes the community preference to expand corridor use to provide transportation opportunities. We understand that the Southeast Conference is exploring opportunities to perform a similar review regarding transmission in Southeast Alaska. We also note that the State of Alaska Department of Transportation has embarked on an examination of multi-modal transportation needs in Southeast.

The potential to serve new large mining and related industrial loads in the region and across the border in Canada will also require expanded transportation and electric transmission infrastructure and additional generating capacity. Proposals to open the Kensington and Jualin mines north of Juneau are currently being considered. Greens Creek Mines has already installed its own diesel generation sources. The direct energy requirements for mining are assumed to be 60 million KWH/year for the Kensington mine, and

Need for System

20 million KWH/year for the Jualin mine. "Take-or-pay" provisions in power contracts with the mines will mitigate the economic risk of developing major new resources associated with mining operations.

4.6

Electric Rate Equalization and Regional Economic Stability

From a public policy perspective, the need to enhance local communities' ability to maintain an appropriate level of economic well-being is a primary interest. During the interviews with local communities, the high unemployment and lack of potential to maintain existing and attract new industry and related employment opportunities, were identified as motivating factors to construct an interconnected system so that lower cost power could be provided to these communities. The *Alaska Electric Power Statistics - 1960-1995* at page 85 presented cost comparisons for 1995 typical monthly electric bills at varying levels for residential customers. Figure 3 and Table 4.1, based on statistics from the above noted document, depict the range from high to low for communities included in this analysis.

**Existing Electrical Transmission
and Generation Facilities**

Existing Electrical Transmission and Generation Facilities

5.1

Existing Electrical Transmission Segments

Existing transmission facilities in Southeast Alaska were constructed to deliver power from generation to specific load centers. Due to the remote locations, many communities are situated on islands, and lack of electrical interconnections among locations, electrical utilities in Southeast Alaska operate their systems to deliver power to their customers and do not have opportunity to import power from other systems to meet electric customer needs. Ability to construct an interconnected system is exacerbated by these remote locations and rough terrain. The one current exception is the interconnection between Lake Tyee and municipally owned and operated electric utilities in Petersburg and Wrangell who share output from the Lake Tyee Project. Nearterm planned interconnections include the intertie between Swan Lake and Lake Tyee that would connect KPU to Petersburg and Wrangell and a planned submarine interconnection between Skagway and Haines to share output of the planned Goat Lake Hydroelectric Project.

In 1995 there were approximately 320 total transmission circuit miles in major load centers in Southeast Alaska: 20 miles @ 25 KV; 25.0 miles @ 34.5 KV; 80 miles energized @ 69 KV, built @ 138 KV; 120.5 miles @ 120.5 KV; 30 miles @ 115 KV; 44 miles at 138 KV. Areas covered by these statistics include Snettisham/Crater Lake, AELP, Sitka Electric System, KPU, and Swan Lake / Tyee Lake. Tables 5.1 and 5.2 provide detailed information regarding these existing facilities.

5.2

Existing Hydropower Generation Facilities

Existing hydro projects in Southeast Alaska are identified in two categories:

- (1) developed by local utilities to serve local load, and
- (2) system hydroelectric projects developed by the State of Alaska or the Federal Alaska Power Administration to serve shared interconnected load centers. Existing hydro projects constructed by utilities to meet specific loads are located in Skagway, Juneau, Sitka, Petersburg, Ketchikan, Metlakatla, and Prince of Wales Island. Existing system hydro electric projects include: Snettisham/Crater Lake, Lake Tyee, and Swan Lake. Figure 1 shows existing system hydropower units and transmission segments; and proposed new system hydropower units and transmission segments. Table 5.3 presents generation capacity and net generation by sector; Table 5.4 lists federal and state-owned hydro generation sources; and Table 5.5 lists all existing generation facilities by utility.

Existing Electrical Transmission and Generation Facilities

Areas served by system hydro projects currently maintain backup diesel capacity equal to 100% peak demand. Diesel units cover emergency operation, peaking requirements, voltage regulation, or meet remaining load requirements not available from the hydro projects. Areas not interconnected to a system hydro project currently maintain diesel capacity equal to 125%-130% of the peak load depending on the ratio.

Table 5.1
Existing Transmission Lines
and Major Interconnections
over 34.5 kV

Area	Circuit Voltage (kv)	Circuit Miles
Juneau (APA & AEL&P)		
Snettisham/Crater Lake - Thane (Federally owned)	138	44.0
Thane - Capital Avenue Sub	69	5.0
Thane Loop Sub (Mendenhall Valley)	69	17.0
Upper Mendenhall Bridge - Auke Bay - Brotherhood Bridge	69	
Sitka Electric Department		
Blue Lake - Sitka and through City	69	5.0
Green Lake - Blue Lake	69	9.0
Ketchikan Public Utilities		
Silvis Lake - Beaver Falls - Ketchikan and through City to North Point Higgins Sub	34.5	25.0
Swan Lake - Ketchikan (State owned)	115	30.0
Petersburg - Wrangell		
Tyee - Wrangell	69*	39.0
Wrangell - Petersburg	69*	42.0

* Line is built to 138 kv standards.

Table 5.2
Existing Transmission Line
Design and Operating
Capabilities

Area	Designed	Operated
Juneau - Snettisham/Crater Lake to Thane	138 KV	138 KV
Juneau - Annex Creek to Thane	23 KV	23 KV
Juneau - Thane to Juneau	69 KV	69 KV
Sitka	69 KV	69 KV
Tyee to Petersburg/Wrangell	138 KV	69 KV
Petersburg	25 and 138 KV	25 and 69 KV
Petersburg to Wrangell	138 KV	69 KV
Wrangell	25 and 138 KV	25 and 69 KV
Ketchikan - Swan Lake to Bailey	115 KV	115 KV
Ketchikan - Higgins to Silvis	34.5 KV	34.5 KV

Existing Electrical Transmission and Generation Facilities

Table 5.3
Generation Capacity and
Net Generation by Sector

Sector	Installed Capacity (KW)	Net Generation (MWb)	Net Growth 1994 - 1995
Utility	344,093	714,950	4.0%
U. S. Coast Guard	1,500	0	0.0%
Industry	90,184	202,481	-14.1%
TOTAL	435,777	917,431	-0.6%

Table 5.4
Existing System Hydro
Generation Sources

Plant	Installed Capacity (MW)	Average Annual Generation (Mwh)
Snettisham	46.0	216,000
Crater Lake	27.0	118,000
Tyce Lake	20.0	114,100
Swan Lake	22.5	85,400
Total	115.5	533,500

Existing Electrical Transmission and Generation Facilities

Table 5.5
Existing Resources

Project Name / Location	Fuel Type	Installed Capacity
Alaska Electric Light & Power Company		
Annex Creek	Hydroelectric	3,600 KW
Auke Bay	Diesel	2,500 KW
	Gas Turbine	24,800 KW
Gold Creek	Hydroelectric	1,800 KW
	Diesel	7,300 KW
Lemon Creek	Diesel	22,500 KW
	Gas Turbine	35,000 KW
Salmon Creek No. 1	Hydroelectric	5,000 KW
Alaska Power Administration		
Snettisham / Crater Lake	Hydroelectric	78,210 kW
Alaska Power & Telephone Company		
Dewey Lake / Skagway	Hydroelectric	975 KW
Goat Lake / Skagway	Hydroelectric	4,000 KW
Diesel / Skagway	(proposed)	3,865 KW
	Diesel	
Black Bear / Craig	Hydroelectric	4,500 KW
	Diesel / Craig	3,820 KW
Haines	Diesel	5,770 KW
Hydaburg	Diesel	1,001 KW
Hollis	Diesel	150 KW
Ketchikan Public Utilities		
S. W. Bailey	Diesel	13,450 KW
Beaver Falls	Hydroelectric	7,300 KW
Ketchikan Lakes	Hydroelectric	4,200 KW
Swan Lake / Revillagigedo Island (State-Owned)	Hydroelectric	22,500 KW
Totem Bight / Ketchikan	Diesel	2,000 KW

Existing Electrical Transmission and Generation Facilities

Project Name / Location	Fuel Type	Installed Capacity
Metlakatla Power & Light		
Purple Lake	Hydroelectric	3,900 KW
Centennial	Diesel	3,300 KW
Chester Lake	Hydroelectric	1,000 KW
Petersburg Municipal Power & Light		
Blind Slough	Hydroelectric	2,200 KW
Petersburg Generation Plant	Diesel	7,650 KW
Tyee (State Owned)	Hydroelectric	20,000 KW
City and Borough of Sitka		
Blue Lake	Hydroelectric	6,000 KW
Green Lake	Hydroelectric	18,000 KW
Indian River	Diesel	7,500 KW
Thorne Bay		
Thorne Bay Plant	Diesel	1,235 kW
Tlingit-Haida Regional Electric Authority		
5 Small Plants (17 units)	Diesel	6,067 kW
Wrangell Electric Department		
Wrangell Municipal Plant	Diesel	8,350 kW

**Status of New Facilities
Development**

Section 6

Status of New Facilities Development

6.1

New Intertie Segments Development

6.1.1

Tyee-Swan Intertie

The planned 57-mile-long 138-Kv Tyee-Swan Intertie is a key element in the proposed interconnected electric transmission SYSTEM. KPU's system is connected electrically to the Swan Lake project. Wrangell and Petersburg are connected to the Lake Tyee project. We include the proposed Tyee-Swan Intertie in Phase I of the SYSTEM Plan. The line will intertie the electrical systems of KPU, PMP&L, and WML&P, thereby increasing reliability and operating efficiency for all three systems. Once the Tyee-Swan Intertie is in place, a grid leg connecting Metlakatla will be feasible.

In 1994, KPU received a grant from the State of Alaska to hire consultants to design the transmission line and prepare the EIS for the Forest Service, August 1997 *Swan Lake-Lake Tyee Intertie Final Environmental Impact Statement Summary* (Swan-Tyee EIS). The USDA Forest Service issued its decision on the proposed Intertie in August 1997 *Swan Lake-Lake Tyee Intertie Record of Decision* (Swan-Tyee ROD). Formal bids were solicited during November - December 1997; and \$76 million in State and Federal funds has been obligated to construct the Tyee-Swan Intertie.

6.1.2

Upper Lynn Canal Intertie

Alaska Power & Telephone Co. (AP&T) plans to construct a 14-mile 33 KV submarine cable transmission interconnection between Skagway and Haines Light & Power (HLP) to provide energy from the new Goat Lake Hydroelectric Project to both locations during 1988. AP&T estimated cost for the intertie is \$5,400,000/1997\$. Annual operating expense for the connection is expected to be \$15,000. AP&T also proposes to construct a 20 mile overhead and underground line between Haines and Klukwan at an estimated cost of \$1,600,000/1996\$. Annual O&M expense is expected to be \$10,000. (*Upper Lynn Canal Regional Power Supply Review*, April 1997). These proposed intertie segments are included in Phase IV of the SYSTEM Plan as existing infrastructure.

6.1.3

Interties on Prince of Wales Island

AP&T is developing transmission lines to deliver energy from AP&T's Black Bear Lake Hydropower Plant to several communities on Prince of Wales Island. (Correspondence from Bob Grimm, AP&T, to Randy Cornelius, Sitka, June 20, 1997). These proposed intertie segments are included in Phase V of the SYSTEM Plan as existing infrastructure.

Status of New Facilities Development

6.2

Current Status of New Generation Facility Development

New hydropower generation currently being investigated by utilities in Skagway, Ketchikan, and Metlakatla are designed to serve specific remote load centers and is not included in the proposed SYSTEM Plan. We note that a number of communities, including Ketchikan and Sitka, are also planning to install additional diesel generation facilities to meet expected shortfall in the near future. We identified the following active hydropower project proposals.

6.2.1

Goat Lake

The Alaska Power & Telephone Co. has received a FERC license and other necessary approvals for the 4.0 MW Goat Lake Project. The project is currently under construction and the expected on-line date is 1998. AP&T is constructing a submarine cable to connect Haines to Skagway which will allow full utilization of the project output.

6.2.2

Mahoney Lake

The Cape Fox Corporation (Cape Fox), permittee for the proposed Mahoney Lake Hydroelectric Project, submitted a draft license application to the FERC in May 1996. That application is currently under evaluation by the FERC. The proposed 9.6 MW run-of-river Mahoney Lake Hydroelectric Project site is located approximately 5 miles northeast of Ketchikan. KPU and Cape Fox are currently discussing development options that might be beneficial to both parties.

6.2.3

Ketchikan Small Hydro Additions

KPU is investigating the potential to install hydropower generation at three existing dams located in close proximity to Ketchikan: Lake Whitman (2.7 MW), Carlanna Lake (0.5 MW), and Lake Connell (1.7 MW); and potential upgrades to its Beaver Falls and Ketchikan Lakes hydropower projects. A preliminary review of these potential future additions is discussed in the *KPU Power Supply Planning Study*, December 20, 1996.

6.2.4

Metlakatla Small Hydro Upgrades/Additions

In March 1997, MP&L issued a report, *Energy Generation Feasibility Study Report*, regarding the quantity of energy available from MP&L's system to export to KPU on a monthly basis. MP&L is currently pursuing proposed improvements at its existing hydropower projects, which are not jurisdictional to the FERC. MP&L will add a 3 MW Pelton-type turbine and generator to augment the existing 1.0 MW unit at its Chester Lake Project; construct a tunnel between Edgecombe and Chester Lakes and new 2800-foot-long 24-inch penstock; and related revisions. At Tamgas Lake MP&L will add a 550 KW Francis-type turbine and generator; modify the existing rock-fill dam to raise lake elevation 10 feet; and will include related revisions. MP&L also proposes to construct a new project at Triangle Lake (commence construction June 2000; complete June 2002) including a new dam, penstock, powerhouse with one 4 MW machine or two 2.0 MW machines, and a tie line.

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Communities in Southeast Alaska strongly support development of an integrated electrical system. Copies of Resolutions adopted in participant communities are included in Appendix A; copies of appendices are available from the Southeast Conference. Participants' expectations expressed during interviews include:

- ▶ identify appropriate sequencing for development - present basic assumptions regarding timing;
- ▶ determine the optimum electric grid to interconnect major load centers in Southeast Alaska, reduce need for redundant diesel generation, and enhance reliability; and
- ▶ determine optimum locations for new hydro generation to provide for future needs for the collective communities.

7.1

Proposed Phasing of Development

We present this proposed SYSTEM Plan in five phases based on assumptions regarding projected load growth and engineering feasibility:

Phase I 1995 - 2010

Construct interties connecting Swan Lake and Tyee Lake hydroelectric projects to Ketchikan Public Utilities' (KPU's) electrical system; and construct an intertie connecting Metlakatla Power & Light to KPU's electrical system.

Phase II 2011 - 2015

Construct interties connecting Sitka and Kake to Petersburg, Ketchikan and Metlakatla.

Phase III 2016 - 2020

Construct interties connecting Angoon, Tenakee Springs, Hoonah, Green's Creek and Juneau to Sitka, Kake, Petersburg, Ketchikan and Metlakatla (North-South Grid). Construct Lake Dorothy and Swan Lake hydropower projects.

Phase IV 2021 - 2025

Construct interties connecting Skagway, Haines, and Kensington to North-South Grid. Construct Takatz Lake Hydropower Project.

Phase V 2026 - 2030

Construct intertie connecting Prince of Wales Island to North-South Grid. Construct Scenery Lake Hydropower Project.

Figure 1, Southeast Alaska Utilities ELECTRICAL INTERTIE SYSTEM PLAN, presents a map of Southeast Alaska with a schematic diagram superimposed to depict load centers, existing and proposed new interties, and existing and proposed new hydroelectric generation facilities. Figure 2, Southeast Alaska Utilities ELECTRICAL INTERTIE SYSTEM PLAN: LOADS AND RESOURCES presents a schematic diagram showing phasing of new generation as loads grow and the transmission intertie SYSTEM is constructed.

7.2 Regional Electrical Interties

Existing transmission facilities in Southeast Alaska were constructed to deliver power from generation to specific load centers. Due to remote islands and rough terrain, electrical utilities in Southeast Alaska currently operate their systems to deliver power to local customers and do not have opportunity to import power from other systems to meet customer needs. The line segments proposed in this SYSTEM Plan are designed to provide equal opportunities for all participating systems to access hydropower generation, thereby lowering power costs in communities currently dependent solely on diesel generation and also providing enhanced reliability of service throughout the region. The integrated electrical SYSTEM will also reduce the level of backup power currently maintained in communities and enhance the opportunity to develop cost-effective and environmentally preferred regional hydropower generation facilities as opposed to proliferation of additional diesel generation and development of numerous dispersed smaller hydropower sites.

7.2.1 Proposed Intertie Segments and Estimated Cost

The primary source of information regarding proposed intertie segments was the 1987 *Southeast Alaska Transmission Intertie Study* (1987 Intertie Study) prepared by Harza for the Alaska Energy Authority. The 1987 Intertie Study presented recommended configurations based on the fundamental objective of sharing then surplus hydro generation at the Snettisham and Lake Tye projects with hydro-deficient supply centers, recognizing technical constraints and practical limitations imposed by terrain and construction costs. Surplus hydro generation at Lake Tye is expected to be fully utilized as a result of constructing the intertie with Ketchikan during Phase I. Snettisham is close to full energy utilization. During critical water years, such as 1997, it was necessary to run AELP diesels to cover hydro energy deficits. For average water years there could be as much as 60 million KWH of surplus energy during the summer and early fall months.

A brief discussion of each of the transmission intertie phases as shown on Figure 1 follows. Table 7.1 presents estimated costs, based on existing reports and escalated to 1996 dollars, for the proposed five phased development. Sources of estimated costs are identified below.

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Table 7.1
Proposed Sequencing and
Cost Estimates for
Southeast Alaska
Transmission Grid
Segments

In-Service Date	Phase New Line Segments	Load Centers
2001	PHASE I: Swan Lake - Lake Tyee (KPU, <i>Initial Draft Power Supply Planning Study</i> , 1996) 57 mi 138-KV line connects Swan-Tyee hydros Status: Final EIS/ USFS Record of Decision issued 8/97. Construction bids to be requested in late 1997. Estimated cost: \$69,772,000/1996\$	Petersburg, Wrangell & Ketchikan
2002	PHASE I: Ketchikan - Metlakatla (Alaska Power Authority, <i>Southeast Alaska Transmission Intertie Study</i> , 1987) 15 mi 34.5 KV line (14 mi OH / 1 mi submarine) Connect KPU's Mountain Point Sub / Race Point, MP&L. Status: Final documents to be prepared once Swan-Tyee line is under construction. Estimated cost: \$8,785,000/1996\$*	Petersburg, Wrangell, Ketchikan & Metlakatla
2002	PHASE II: Petersburg - Kake - Sitka II-A - Petersburg - Kake (DCRA, Division of Energy, <i>Kake-Petersburg Intertie Feasibility Study</i> , 1996) 46.7 mi 69 KV (44.3 mi OH / 2.4 mi submarine) capable of upgrade to 138 KV. Status: 1996 update to 1987 appraisal level engineering / environmental review. Estimated cost: \$19,734,600/1996\$	Sitka, Kake, Petersburg, Wrangell, Ketchikan & Metlakatla
2008	II-B - Kake - Sitka (Alaska Power Authority, <i>Southeast Alaska Transmission Intertie Study</i> , 1987) 55.4 mi 138 KV (20.2 mi OH / 35.2 mi DC submarine) cable Status: Reconnaissance engineering / environmental. Estimated cost: \$45,489,000/1996\$*	
2012	PHASE III: Sitka - Tenakee Springs/Angoon - Hoonah - Greens Creek - Juneau (Alaska Power Authority, <i>Southeast Alaska Transmission Intertie Study</i> , 1987) 148.6 mi 138 KV (120.8 mi OH / 27.8 mi AC submarine) Status: Appraisal level engineering / environmental review. Estimated cost: \$173,788,000/\$1996\$*	Sitka, Angoon, Tenakee Springs, Hoonah, Greens Creek, Juneau to Petersburg, Wrangell, Ketchikan, Metlakatla (North-South Grid)
2020	PHASE IV: Juneau - Skagway (Alaska Power Authority, <i>Haines-Skagway Region Feasibility Study</i> , 1981) 70.5 mi (6.5 miles 69 KV OH / 64 miles 100 KV DC submarine) Status: Appraisal level engineering / environmental review. Estimated cost: \$79,160,000*	Connects Skagway, Haines, and Kennington, north of Juneau, to North-South Grid
2025	PHASE V: Ketchikan - Prince of Wales Island (Alaska Power Authority, <i>Black Bear Feasibility Report</i> , 1981) 19 mi 69 KV or 115 KV (1 mi OH / 18 mi submarine) Status: Appraisal level engineering / environmental review. Estimated Cost: \$ 39,089,000*	Connects Thorne Bay, Kasan, Klawock, Hollis, Craig, and Hydaburg to North-South Grid
System Totals	243.8 mi OH / 148.4 mi submarine 392.2 total miles Construction Cost Estimate \$435,817,000/1996	

* Indicates cost prepared using standard cost curves to complete earlier estimates.

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7.2.1.1 Phase I

The Swan-Tyee and KPU-Metlakatla transmission intertie components would interconnect electric systems in Ketchikan, Wrangell, Petersburg, and Metlakatla resulting in the first increment of the Southeast Alaska Electrical Intertie SYSTEM (SYSTEM). This intertie segment is expected to utilize current surplus generation available from Lake Tyee. As shown in Figure 2, the existing generation resources of the respective utilities in an interconnected grid will be adequate to supply the gross annual loads of the system through the year 2010. Therefore, no additional hydroelectric resources are required during this period.

- Lake Tyee-Swan Lake Transmission - 138 KV, 37 miles, to connect the two State-owned hydropower projects. Estimated total cost includes management, engineering, construction management, licensing and permitting, right-of-way costs, a contingency and owners administration; excludes maintenance costs (*Project Estimate Update, Lake Tyee-Swan Lake Intertie, Raytheon Infrastructure Services, Inc., July 25, 1996*).
- Ketchikan-Metlakatla - 34.5 KV, 15 miles, three-phased (14 miles overhead and 1 mile submarine) from KPU's Mountain Point Substation to Race Point on Annette Island. Estimated cost includes management, engineering, construction management, land acquisition, and owners administration; excludes maintenance costs. (Alaska Power Authority, 10/1/87, *Southeast Alaska Transmission Intertie Study*) A 1996 DCRA, Division of Energy, study, *Power Intertie Analysis*, prepared by Jaight and McLaughlin Consulting Engineers, Anchorage, confirmed the proposed route as presented in 1987. No update to estimated cost was provided. (*Rural Alaska Electric Utility Interties, March 1997*).

Preliminary cost estimates for development of intertie segments specified during Phase I are \$69,772,000/1996\$ for the Swan Lake - Lake Tyee Project and \$8,785,000/1996\$ for the Ketchikan Metlakatla intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

7.2.1.2 Phase II

Kake and Sitka would be connected to the SYSTEM. Again the existing resources match reasonable well the overall loads of the interconnected system, thereby requiring no further hydropower development through the year 2015.

- Petersburg-Kake - 69 KV, 46.7 miles (44.3 miles overhead and 2.4 miles submarine cable), capable of future upgrade to 138 KV. Estimated cost includes construction, engineering, construction management, right-of-way acquisition, permitting, and owners administration. Proposal does not

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include previously proposed underground sections. A number of studies have been performed for this line segment. In 1996 DCRA, Division of Energy, commissioned an update: *Feasibility Study: Kake-Petersburg Intertie*, prepared by R. W. Beck, that incorporated and updated information presented in earlier reports.

- Kake-Sitka - 138 KV, 55.4 miles (35.2 miles DC submarine cable and 20.2 miles overhead wood pole design). Estimated cost includes management, engineering, construction management, land acquisition, and owners administration; excludes maintenance costs. Most of route follows existing road at anadromous fish stream crossings. (Alaska Power Authority, 10/1/87, *Southeast Alaska Transmission Intertie Study*).

Preliminary cost estimates for development of intertie segments specified during Phase II are \$19,734,600/1996\$ for the Petersburg - Kake Intertie and \$45,489,000/1996\$ for the Kake - Sitka Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

7.2.1.3 Phase III

Angoon, Tenakee Springs, Hoonah and Juneau would be connected to the SYSTEM. At this point the load growth for Juneau becomes the major factor in determining the needs of the interconnected system. If mining loads develop during the next few years, Lake Dorothy may be brought on-line before 2015. Further, based on the load growth as projected for Juneau, the system loads can also fully utilize the proposed Swan Lake project within the 2015 - 2020 time frame.

- Sitka-Juneau - 138 KV, 148.6 miles (120.8 miles OH, 27.8 miles submarine AC cable) \$130,775,000/1987\$ This preferred routing would need further study as it was not proposed as part of the system in the APA 1987 *Southeast Alaska Transmission Intertie Study*. Total length of the West Route alternative considered in the 1987 study was 204 miles, including the Juneau-Green's Creek and Sitka-Kake segments. Alternative preferred in 1987 study was the Kake-Snettisham connection. (Alaska Power Authority, 10/87, *Southeast Alaska Transmission Intertie Study*) Descriptions of segments of the preferred routing are discussed below:
- Tenakee Springs-Sitka - 138 KV follows existing logging roads past Sitkoh Lake to Point Lindenburg, crosses Peril Strait via submarine cable, exits at Point Moses on Baranof Island to finally connect with Sitka's transmission system. Routing envisioned would go to Warm Springs and Takatz Lake Hydro crossing to Sitka along a proposed transmission/transportation corridor.

- ▶ Tenakee Springs-Angoon - 138 KV (submarine AC cable) crossing Tenakee Inlet to east of Kadashan Bay along existing logging roads to point NW of head of Sitkoh Bay, remote substation to facilitate 69 KV spur to Angoon.
- ▶ Tenakee Springs-Hoonah - 138 KV 35-mile utility corridor is designated in the Tongass Land Management Plan. The communities are almost connected by logging roads now. (*Rural Alaska Electric Utility Interties, March 1997*)
- ▶ Hoonah-Juneau - 69 KV, 50.4 miles (32.3 miles OH, 18.1 miles submarine cable) to connect Hoonah to Snettisham Hydro Plant (includes connection @ Greens Creek noted below). Estimated cost includes 20% for engineering and overhead plus 25% for contingencies. Feasibility depends upon hookup to Noranda mine. 3 substations, 2 separate segments of submarine cables (6.1 mile and 12 mile) (U.S. Department of Energy, Alaska Power Administration, 12/1/81, *Juneau-Hoonah Transmission Line Reconnaissance Evaluation*)(*Rural Alaska Electric Utility Interties, March 1997*).
- ▶ Juneau - Green's Creek - 69 KV, 29.4 miles (24.2 OH, 5.2 submarine cable) Douglas Island substation to Middle Point - cross Stephens Passage - Youngs Bay near Hawk Inlet on Admiralty Island. USFS recommended buried cable through portion of non-wilderness Admiralty Island National Monument. (Alaska Power Authority, 10/87, *Southeast Alaska Transmission Intertie Study*).

Preliminary cost estimates for development of intertie segments specified during Phase III are \$173,788,000/1996\$ for the Tenakee Springs/Angoon/Hoonah/Greens Creek/Juneau Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

7.2.1.4 Phase IV

Skagway and Haines would be connected to the SYSTEM through a 70.5+ mile (64 miles 100 KV DC submarine cable, 6.5+ miles OH 69 KV) line segment from Juneau to Skagway. Estimate based on 1982 Teshmont study excludes escalation during construction but includes 25% contingencies and 15% engineering. (*Rural Alaska Electric Utility Interties, March 1997*) By 2020, either the Takatz Lake project or the Scenery Lake project could be added to the system. Takatz Lake is shown on Figure 2 as a part of Phase IV on the basis of the proposed road interconnection from Warm Springs and the transmission system to Sitka as factors in reducing the environmental effects and cost of development.

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Preliminary cost estimates for development of intertie segments specified during Phase IV are \$79,160,000/1996\$ for the Juneau - Skagway Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

7.2.1.5 Phase V

Communities on Prince of Wales Island would be connected to the SYSTEM. With this addition in 2025, the cumulative load projections of the respective communities indicate that the output of Scenery Lake would be fully utilized in its first year of operation. Connection is assumed to be between Ketchikan and Hollis - 69 or 115 KV, 19 miles (18 miles submarine cable and 1 mile overhead line). (Alaska Power Authority, 10/1/81, *Black Bear Lake Project: Feasibility Report*, Harza).

Preliminary cost estimates for development of intertie segments specified during Phase V are \$39,089,000/1996\$ for the Ketchikan - Prince of Wales Intertie. Estimated costs were presented in documents prepared by others and reviewed by the Acres team during the course of this assignment and do not represent an independent assessment.

7.2.2 Review of Existing Reports

The primary source of information used in preparing this Report was the 1987 *Southeast Alaska Transmission Intertie Study* prepared by Harza for the Alaska Energy Authority (1987 Intertie Study). The 1987 Intertie Study presented a comprehensive assessment of a large number of prospective interconnection projects, including route selection and preliminary design of many submarine cable links and overhead lines, and integrated these designs into an overall system expansion plan. The 1987 Intertie Study constitutes an important step towards an integrated system development plan, but the investigations must be expanded and updated to ensure the continued validity of several key conclusions.

Table 7.2 identifies sources of information relied on in preparing this Report and as requested in the RFP identifies the level of investigation and project development accomplished to date.

7.3 Regional Generation

Hydro generation is a major element in the existing power supply of the region. However, the water power potential of Southeast Alaska is still largely an undeveloped resource. A report entitled "Water Powers of Southeast Alaska" was prepared in 1947 by the Federal Power Commission (currently known as the Federal Energy Regulatory Commission) and the U.S. Forest Service (FPC/USFS Report) which identified 200 sites for potential hydropower development. A following statement as contained in the Forward

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by the Chairman of the Commission is as true today as it was some 50 years ago:

Table 7.2
Documents Reviewed -
Potential New Transmission

Date	Report	Level of Development
October 1987	Alaska Power Authority Southeast Alaska Transmission Intertie Study	Reconnaissance
August 1997	USDA Forest Service Swan Lake - Lake Tyee Intertie Final Environmental Impact Assessment Final Record of Decision	Final Route Selection
April 1996	Alaska Department of Community and Regional Affairs Kake-Petersburg Intertie Feasibility Study	Draft Reconnaissance
April 1997	Alaska Power & Telephone Co. Upper Lynn Canal Regional Power Supply Review	Draft Reconnaissance
March 1997	Alaska Department of Community and Regional Affairs Rural Alaska Electric Utility Interties	Preliminary Design Survey

"...There are over 200 potential projects which it is estimated could develop 1,008,370 average horsepower. Of these, 27 range in size from 10,000 to 51,000 average horsepower each, or a total potential of 534,000 average horsepower. In developing a power system many of these projects would logically be interconnected with high voltage transmission. The remaining projects and some of less capacity, but susceptible to automatic control and operation, could be interconnected through the principal stations at lower voltage transmission..."

Over the intervening years, slow but steady progress has been made in this direction. The current SYSTEM Development Action Plan, then, simply represents a continuation of this process. In more recent times, many of the projects identified in the FPC/USFS Report have either been developed as listed above or have been studied in further detail as summarized in Section 7.3.5 that follows. Of these, project that have been identified as having the highest potential for inclusion into the SYSTEM Development Action Plan include:

- 10 MW proposed 3rd unit at the existing Lake Tyee Project
- 26 MW proposed Lake Dorothy Project, Taku Inlet
- 48.5 MW proposed Swan Lake Project, Thomas Bay
- 20 MW proposed Takatz Lake Project, Baranof Island
- 45 MW proposed Scenery Lake Project, Thomas Bay

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A general description of each of the above listed projects and a discussion of the respective studies performed to-date follows. Table 7.3 presents potential average annual generation.

Table 7.3
Potential New SYSTEM
Hydroelectric Projects

Plant	Installed Capacity (MW)	Average Annual Generation (MWh)
Tyee Lake (3rd unit)	10.0	1,000
Lake Dorothy	26.0	127,000
Swan Lake	48.5	170,000
Takatz Lake	12.0	86,000
Scenery Lake	45.0	150,000
Total	141.5	534,000

7.3.1 Potential New Hydropower Projects

7.3.1.1 Third Unit at Tyee Lake

A third unit bay was installed during original construction of the Tyee Lake project in anticipation of future growth in the region. A 10 MW turbine-generator would provide an additional 1,000 Mwh of peaking energy annually; an additional benefit of the third unit is to recover 1,050 Mwh of energy during maintenance on either of the two existing 10 MW units.

The third unit would support future growth in Wrangell and Petersburg, the two communities that have priority rights to power generated at Lake Tyee. With construction of additional interties, energy could be available to Ketchikan, Metlakatla, and Kake.

7.3.1.2 Lake Dorothy

Lake Dorothy is located east of Juneau above Taku Inlet at elevation 2422. Hydroelectric power could potentially be developed at the site by the construction of a lake tap to supply water to an 11 foot diameter, 2¼ mile long tunnel leading to a powerhouse at tidewater containing two 13 MW units. A 4½ mile long submarine cable would be interconnected with the existing 138 KV Snettisham transmission line to provide 26 MW of capacity and 127,000 Mwh of firm and average annual energy to the Juneau area.

The Alaska Electric Light & Power Company (AELP) currently holds a Preliminary Permit from the FERC for study of the site. The Permit was applied for in anticipation of the re-opening of the A. J. Mine in Juneau. Since

the time of the permit application, however, Echo Bay Alaska has dropped plans for proceeding with AJ Mine development. A recent inspection of the Snettisham underwater cable crossing Taku Inlet indicates a redundant set of cables will have to be installed to insure the reliability of Juneau's Snettisham energy supply. The new cables will be sized to have the capacity to carry both Snettisham and Lake Dorothy generation and will substantially reduce Lake Dorothy's construction costs. AELP is also investigating other scenarios for reducing the scope and cost of Lake Dorothy so that it could be sized to serve the proposed Kensington Mine. The Kensington Mine is close to being fully permitted. These additional considerations may require AELP to apply for a subsequent Permit.

7.3.1.3 Thomas Bay - Swan Lake

Swan Lake is located approximately 15 miles northeast of Petersburg above Thomas Bay at elevation 1520. Hydroelectric power could potentially be developed at the site by the construction of a lake tap to supply water to a 7 foot diameter, 2½ mile long tunnel leading to a powerhouse at tidewater containing two 24.25 MW units. A combination of overhead transmission and submarine cable would interconnect the project with the grid at Petersburg to provide 46.5 MW of capacity and 170,000 Mwh of firm and average annual energy to the region.

The Swan Lake site was initially proposed in an application for a license to the Federal Power Commission in 1922. The license was issued but later terminated. Subsequently, the US Bureau of Reclamation completed an Interim Report on the potential of the Thomas Bay area dated, June 1965. The hydroelectric project was under consideration to meet the urgent power needs at that time in Petersburg, Wrangell, Kake, Ketchikan and Metlakatla. A geology report on the project had been developed earlier in January 1962.

Petersburg retained R. W. Beck and Associates to analyze electrical power requirements for the City which culminated in a report, "Analysis of Electrical System Requirements", dated March 1974, presenting the site as a potential power resource. Beck also prepared an Appraisal Report for the Thomas Bay Power Commission for review as a resource for the communities of Petersburg and Wrangell. However, the project was later dropped from consideration in favor of the Lake Tyee Project which was subsequently constructed.

Currently, the project's capability far exceeds the needs of the Petersburg / Wrangell area for the foreseeable future and would accordingly be available as a regional resource.

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7.3.1.4

Takatz Lake

Takatz Lake is located approximately 15 miles directly east of Sitka above Takatz Bay at elevation 920. Hydroelectric power could potentially be developed at the site by the construction of a lake tap to supply water to a 8 foot diameter, 1¼ mile long tunnel leading to a powerhouse at tidewater containing two units. Studies conducted have proposed installations ranging from 12 MW to 20 MW.

Previous studies have consistently identified Takatz Lake as the next hydro project for development by the City and Borough of Sitka. In fact, the US Department of the Interior, Alaska Power Administration/Bureau of Reclamation made a fairly detailed evaluation of the Takatz Lake site in the 1960s, and it was considered a serious alternative to the existing Green Lake Project. Green Lake was ultimately developed due to the relative cost of transmission for the two sites.

Previous evaluations of the Takatz Lake site have included an overhead transmission line for the 25 mile distance between the powerhouse site and the existing Sitka distribution system. The resulting routing involved traversing some extremely rugged terrain, including two mountain passes -- one between the Takatz Lake drainage and the Baranof Lake drainage at about elevation 2100, and one between the upper Baranof drainage and the upper Sawmill Creek drainage at about elevation 2900. The resulting construction cost of this transmission connection is the primary reason why this site remains undeveloped.

Serious consideration is now being given to the construction of a road between the Baranof / Warm Springs area and Sitka as a means to improve ferry service along the Alaska Marine Highway as well as tourism from cruise ships. The proposed road would include a 1 mile long tunnel through the most rugged part of the terrain as referenced above. Clearly, the incremental cost of a transmission line constructed along the right-of-way of the proposed road would be significantly less than previously considered thereby greatly increasing the economic viability of Takatz Lake site for hydropower development.

Currently, the project's capability exceeds the needs of the Sitka area and would accordingly be available as a regional resource. The City anticipates, however, that at some point in time all of the output of the project will be needed within their system.

7.3.1.5

Thomas Bay - Scenery Lake

Scenery Lake is located approximately 7 miles north of the Swan Lake site as discussed above or 22 miles northeast of Petersburg. It is situated above Thomas Bay at elevation 1,080. Hydroelectric power could potentially be developed at the site by the construction of a lake tap to supply water to a 7

foot diameter, 3½ mile long tunnel leading to a powerhouse at tidewater containing two 22.5 MW units. An overhead transmission line would interconnect the project with the grid at the Swan Lake site to provide 45 MW of capacity and 150,000 MWH of firm and average annual energy to the region. Unlike the other above listed projects, the Scenery Lake site has not been studied in any detail. The only identifiable reason for this lack of interest is that to-date no need for the project has occurred in the surrounding area beyond the potential provided by the Swan Lake site. A description of the features and the potential of the site was included in the FPC/USFS Report which has served as the basis of the data included herein.

7.3.1.6

Lake Grace Diversion to Swan Lake Hydroelectric Project

Lake Grace is located 28 miles from Ketchikan on the east side of Revillagigedo Island. A Power Project Withdrawal application was filed with the Federal Power Commission on November 21, 1926 but was vacated by the FERC on October 31, 1985. KPU is currently reviewing the long-term feasibility of diverting water from Lake Grace through a tunnel to Swan Lake. Water would be used to increase water storage capacity, thereby increasing generation at Swan Lake. KPU is considering installing a new turbine at Swan Lake.

A major regulatory barrier to developing Lake Grace is its location within the Misty Fjords National Monument in a designated Wilderness Area. Development of Lake Grace would require approval by the President of the United States with concurrence of the U. S. Congress. Language in Section 1105.2 of ANILCA further limits development by requiring that such authorization may be obtained only if "... there is no economically feasible and prudent alternative..."

7.3.2

Proposed Phasing of New Hydroelectric Projects

Normally, the phasing of hydroelectric projects within a power system grid is based largely on the estimated cost of each respective potential project. By nature, hydroelectric projects are capital cost intensive and are generally very site specific. In the present case, no consistent set of cost estimates are available as a means of comparison for the above identified projects. What is known, however, is the above listed projects have very similar characteristics consisting of lake taps at perched lakes with tunnels of reasonable length leading to powerhouses at tidewater. Therefore, development costs can be expected to be comparable and consistent with others recently developed in the region.

Accordingly, it is appropriate to phase project development on the basis of projected needs for the intertie itself coupled with due consideration to the load growth in the region as a whole. Thus, the intertie is the key factor in the phasing of hydro generation projects. A regional intertie will enable full

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utilization of each project as it would come on-line without the particular needs of the respective nearby communities. Shown on Figure 2 is a potential phasing of the five candidate projects listed above based on meeting the regional loads in step with the development of each component of a regional transmission grid. A brief discussion of each of the transmission intertie phases describing correlation to future hydro power project development follows.

7.3.2.1 Phase I

The proposed Phase I transmission intertie component would interconnect Metlakatla with Ketchikan, Wrangell and Petersburg. As shown on Figure 2, the existing resources of the respective utilities in an interconnected grid will be adequate to supply the gross annual loads of the system through the year 2010. Therefore, no additional hydroelectric resources are required during this period.

7.3.2.2 Phase II

The proposed Phase II would add Sitka and Kake to the transmission system. Again the existing resources match reasonably well the overall loads of the interconnected system, thereby requiring no further hydropower development through the year 2015.

7.3.2.3 Phase III

The proposed Phase III would add Angoon, Tenakee Springs, Hoonah and Juneau to the transmission system. At this point the load growth for Juneau becomes the major factor in determining the needs of the interconnected system. It indeed is possible that Lake Dorothy may have been brought on-line before 2015. Further, based on the load growth as projected for Juneau, the system loads can also fully utilize the Swan Lake project within the 2015 - 2020 time frame.

7.3.2.4 Phase IV

The proposed Phase IV would add Skagway and Haines to the transmission system. By 2020, either the Takatz Lake project or the Scenery Lake project could be added to the system. Takatz Lake has been shown on Figure 3.1 as a part of Phase IV on the basis of the proposed road interconnection from Warm Springs and the transmission system to Sitka as factors in reducing the environmental effects and cost of development.

7.3.2.5 Phase V

The proposed Phase V would add the communities on Prince of Wales Island to the transmission system. With this addition in 2025, the cumulative load projections of the respective communities indicate that the output of Scenery Lake would be fully utilized in its first year of operation.

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7.3.3

Review of Existing Reports - Hydropower Projects

Reports relied on in preparing this section are identified in the above narrative sections. Table 7.4 identifies the level of development of each of the relevant reports.

Table 7.4
Documents Reviewed -
Potential New Hydroelectric
Projects

Date	Report	Level of Development
10/1987	Alaska Power Authority <i>Southeast Alaska Transmission Intertie Study</i>	Reconnaissance
8/1997	USDA Forest Service <i>Land and Resource Management Plan, Tongass National Forest</i> <i>Tongass Land Management Plan Revision</i> <i>Final Environmental Impact Assessment</i>	Identifies constraints to new development; list projects consistent with plan
12/1996	Ketchikan Public Utilities <i>KPU Power Planning Study</i>	Identifies potential projects; Feasibility study underway.
3/1997	Metlakatla Power & Light <i>Energy Generation Feasibility Study Report</i>	Describes proposed upgrades and potential new project. No data provided.
1947	Federal Power Commission and Forest Service - U.S.D.A. <i>Water Powers - Southeast Alaska</i>	Identifies 200 sites for potential hydropower development
1992	Ketchikan Public Utilities <i>Lake Tye to Swan Lake Transmission Intertie Feasibility Study</i>	Update to existing reports and review of feasibility
4/1974	Electric Utility System - City and Borough of Sitka <i>Analysis of Electric System Requirements</i>	Project feasibility investigation
3/1974	Petersburg Municipal Power & Light <i>Analysis of Electrical System Requirements</i>	Appraisal
11/1975	Thomas Bay Power Commission, Petersburg - Wrangell <i>Appraisal Report</i>	Appraisal
1960	U. S. Department of the Interior Alaska Power Administration/Bureau of Reclamation <i>Takatz Creek Project - Alaska</i>	Detailed evaluation
10/1985	Alaska Electric Light and Power Company <i>Application for New License - Aniak Creek and Salmon Creek</i>	Operating Projects discussion of Alternatives
10/1991	City and Borough of Sitka, Alaska <i>Electric Resource Evaluation and Strategic Plan</i>	Feasibility analysis
8/1990	Alaska Electric Light and Power Company <i>Juneau 20-Year Power Supply Plan Update</i>	Reconnaissance review
6/1991	Alaska Power & Telephone Company <i>Application for License - Black Bear Lake Project</i>	Project feasibility and design

7.4

Economic and Financial Issues

7.4.1

Economic Parameters

Economic parameters and assumptions used in evaluating alternatives presented in the 1987 Study were based on guidelines supplied by the Alaska Power Authority and local utilities. These criteria are generally accepted in performing economic analysis and should be updated and applied in future analyses regarding the proposed Southeast Alaska Electrical Intertie SYSTEM. Annual fixed carrying charges employed in the 1987 Intertie Study are listed on Table 7.5.

Table 7.5
Annual Fixed Carrying
Charges - Alaska Power
Authority Guidelines
Employed in 1987
Southeast Alaska
Transmission Intertie Study

		20-Year Life	30-Year Life	50-Year Life
Cost of Money	(%)	3.50	3.50	3.50
Amortization	(%)	3.54	1.94	0.76
Insurance	(%)	0.25	0.20	0.20
Total	(%)	7.29	5.64	4.46

Criteria include the following:

- ▶ Costs are expressed in dollars
- ▶ Present Worth Analysis covers a 30-year economic life / transmission
- ▶ Planning Horizon/Period of Study is 20 years
- ▶ Discount Rates used are as appropriate for participants
- ▶ Inflation Rate is the current rate
- ▶ Economic Life of Projects
 - Diesel Generators - 20 years
 - Transmission Lines - 30 years
 - Hydroelectric Plant - 50 years

The Economic Analysis presented in the 1987 Study was performed in two steps. The first step, an economic screening, compared the construction cost of each intertie link to the value of the potential displaced diesel fuel. The screening was performed by comparing

the net present worth life cycle costs of the intended transmission link with that of the existing diesel system. The sunk cost of existing hydroelectric developments and transmission and distribution systems were assumed to be the same for all economic cases considered and were excluded from further analysis. Analyses were conducted using Alaska Power Authority criteria for discount rates, energy demand, and fuel costs. The planning horizon for the study spanned 20 years.

An important goal of the 1987 Study was to determine the most practical way to utilize surplus energy available from the Snettisham/Crater Lake and Swan Lake-Lake Tyee hydroelectric projects. Transmission interties between Juneau and Sitka and Lake Tyee and Swan Lake were preferred new transmission segments. Completion of those segments was predicted to use nearly all (96%) of the surplus generation from the two hydro projects by 2006. The Swan Lake-Lake Tyee Intertie is proposed to be developed in Phase I; the intertie between Sitka and Juneau is proposed in Phase III. Power over the intertie will supply near-term Ketchikan, Petersburg, and Wrangell needs; any remaining surplus would be provided to Metlakatla and Kake. Based on predicted load growth in the Juneau area, surplus power cited in the 1987 report at Snettisham/Crater Lake would be fully utilized during Phase II.

7.4.2 Electric Load Characteristics and Forecasts

The scope and budget for this assignment did not include a rigorous update to load forecasts to accurately model the load distribution for evaluation of proposed transmission grid legs. All information regarding utility loads and resources is compiled from existing sources of information and included in this SYSTEM Plan as background information supporting the phased development of the SYSTEM. Discussions of predicted future load growth for municipalities and utilities in Southeast Alaska are based on existing documents and interviews with municipalities and utilities. Table 7.6 presents predicted loads.

Reports reviewed in preparing information in this section are identified below.

Electric Load Forecast for Ketchikan, Metlakatla, Petersburg, and Wrangell, Alaska: 1990 - 2010 - ISER 1990 Forecast

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Table 7.6
Load Growth Projections for
Participating Communities
Average Annual Growth
Rate

UTILITY / LOCATION / PHASE	1990	2000	2010	2020
KPU / Ketchikan / PHASE I(1)	2.0	2.0	2.0	2.0
PMP&L / Petersburg / PHASE I(1)	1.3	1.3	1.6	1.6
WMP&L / Wrangell / PHASE I(1)	1.3	1.3	1.6	1.6
MP&L / Metlakatla / PHASE I(1)	1.7	1.7	1.5	1.5
THREA / Kake / PHASE II(2)	1.2	1.2	1.2	1.2
SED / Sitka / PHASE II(3)	1.0	1.0	1.0	1.0
AELP / Juneau / PHASE III(4)	2.5	2.5	2.5	2.5
THREA / Angoon / PHASE III(2)	1.2	1.2	1.2	1.2
THREA / Hoonah / PHASE III(2)	1.2	1.2	1.2	1.2
AP&T / Skagway / PHASE IV(5)	1.4	1.4	1.4	1.4
AP&T-HLP / Haines / PHASE IV(5)	2.0	2.0	2.0	2.0
THREA / Chilkat Valley / PHASE IV(2)	1.2	1.2	1.2	1.2
COCO / Coffman Cove / PHASE V(7)	1.2	1.2	1.2	1.2
AP&T / Craig / PHASE V(6)	2.5	2.5	2.5	2.5
AP&T / Hollis / PHASE V(6)	2.5	2.5	2.5	2.5
AP&T / Hydaburg / PHASE V(6)	2.5	2.5	2.5	2.5
THREA / Klawock / PHASE V(2)	1.2	1.2	1.2	1.2
THREA / Kasan / PHASE V(2)	1.2	1.2	1.2	1.2
TB / Thorne Bay / PHASE V(7)	1.2	1.2	1.2	1.2

- (1) Electric Load Forecast for Ketchikan, Metlakatla, Petersburg and Wrangell, AEA/ISER, 1990
- (2) 1997 - 1999 Three-Year Construction Work Plan, THREA, 1996
- (3) 1996 Electric System Load Forecast, SED, 1996
- (4) Juneau 20-Year Power Supply Plan, AELP, 1990
- (5) Upper Lynn Canal Regional Power Supply Review, AP&T, 1997
- (6) Environmental Assessment, Black Bear Hydroelectric Project, FERC, 1992
- (7) Alaska Electric Power Statistics - 1960-1995, DCRA/DE & ASCC, 1996