UTAH POWER & LIGHT COMPANY

1407 WEST NORTH TEMPLE STREET

SALT LAKE CITY, UTAH 84140

'89 MAY 30 P2:1

THOMAS W. FORSGREN
VICE PRESIDENT
REGULATORY AND GOVERNMENTAL AFFAIRS
801-220-4261

SERVICE COMMISSION

May 30, 1989

Brian T. Stewart, Chairman
Public Service Commission of Utah
P. O. Box 45585
Salt Lake City, UT 84145

Dear Chairman Stewart:

In late April, the Company announced a decision to consolidate its two computer centers into one located in Portland, Oregon. That decision involved the following:

1. determine the optimal configuration of equipment and facilities in the context of current and future technology;

2. determine single versus multiple site economics; and

3. select the best site, after determining that significant savings, service standards, security, reliability and client interfaces could be met with one site.

While developing the decision, a number of drafts, interim reports, alternative analysis and other documents were prepared. Some of these drafts were copied and gained wider distribution than deserved. The final report, dated April 25, 1989, titled "Pacific & Utah Power Data Center Study" represents the culmination of all discussions and interim and draft reports and supersedes all prior documents relating to this matter. A copy of the final report is enclosed.

Page 3 of the report summarizes reasons for selection of Portland as the single site. Page 4 of the report shows a summary of savings due to consolidation over a six-year period.

progress in this area and you have our assurance that we will pursue all options to meet our commitments to displaced employees.

Please accept this correspondence as notification of merger related actions and advise the Company of any additional required information.

Sincerely,

Thomas W. Forsgren

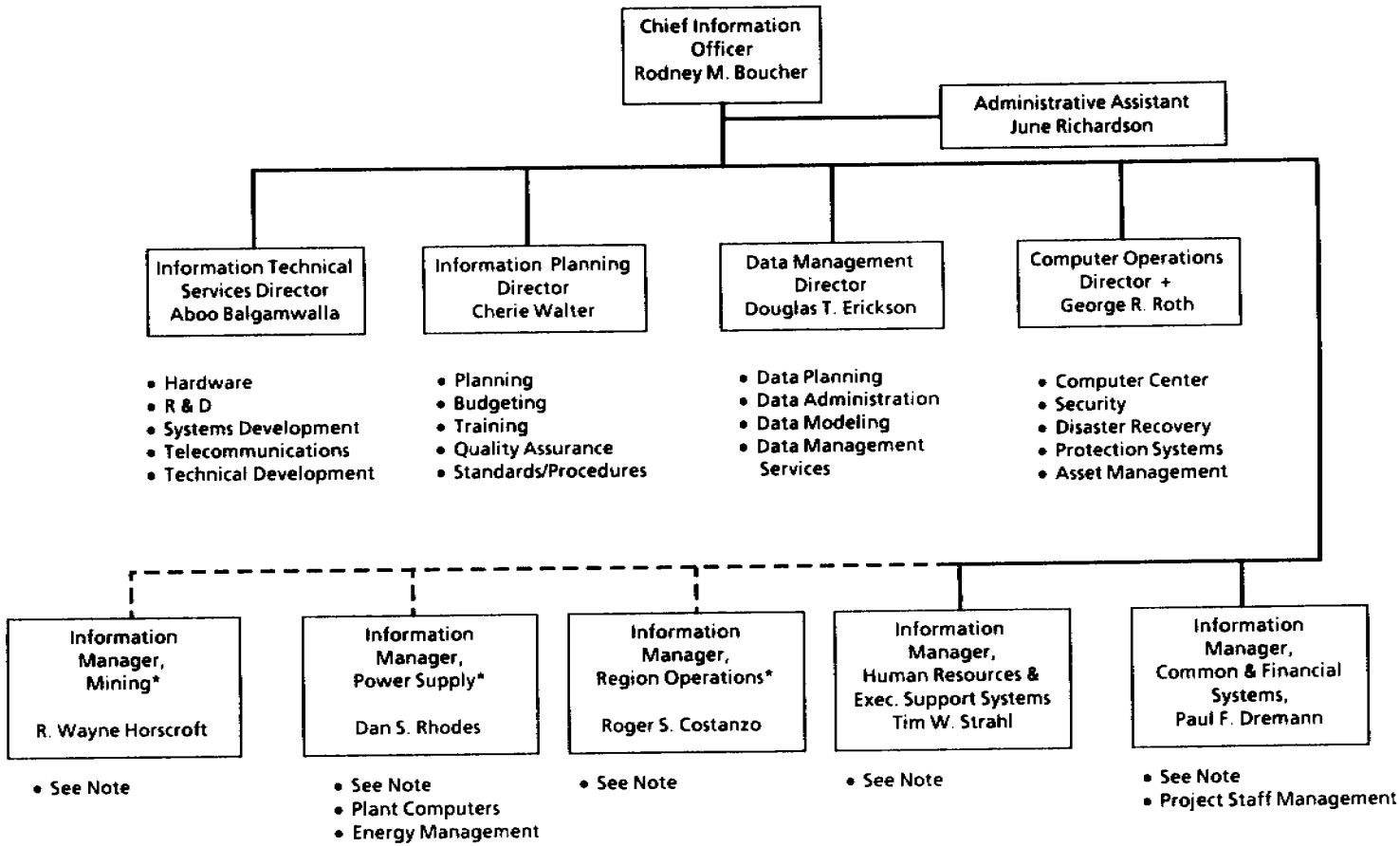
TWF:ros

Enclosures

cc: Frank Johnson
Ralph N. Creer

4/25/89

INFORMATION MANAGEMENT ORGANIZATION



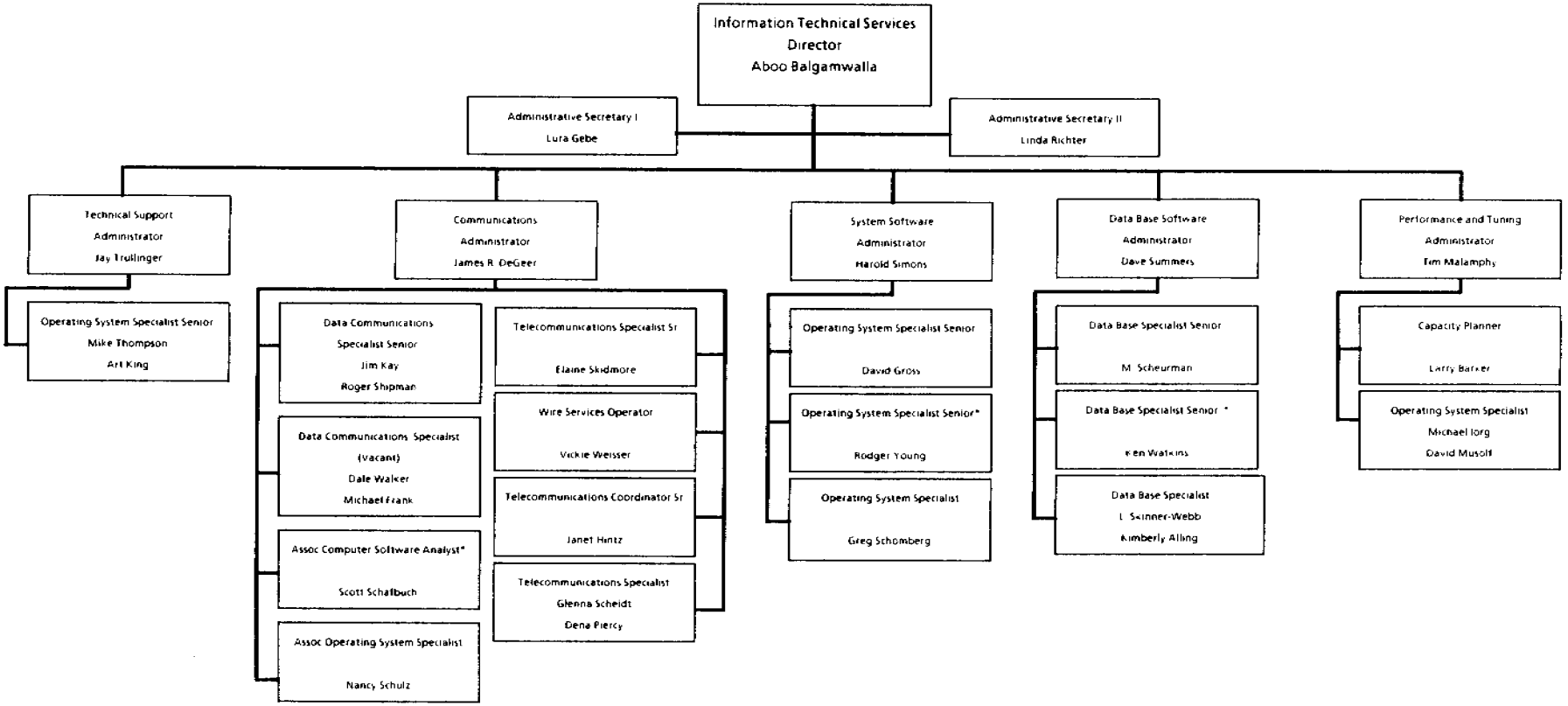
Note: Each Information Manager has responsibility for application development & maintenance, workstation & LAN support.
Dotted line positions report directly to parent organizations.

* Utah Based Positions
\+ Location to be determined

George R. Roth, Paul F. Dremann, Roger S. Costanzo, Dan S. Rhodes, and R. Wayne Horscroft are from the old Utah Power and Aboo Balgamwalla, Cherie Walter, Douglas T. Erickson, and Tim W. Strahl are from the old Pacific Power.

4/25/89

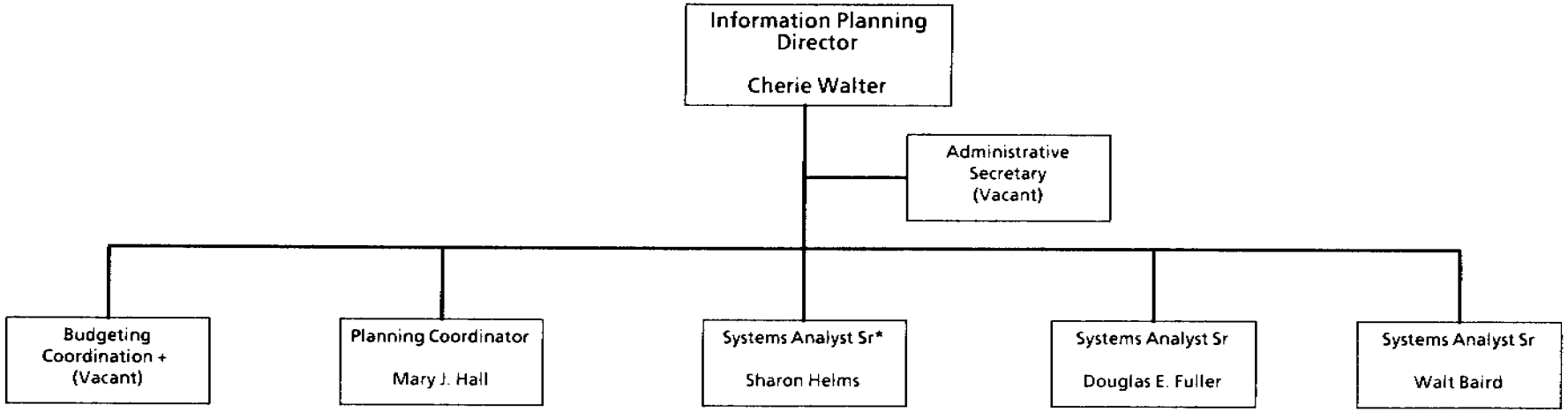
INFORMATION MANAGEMENT
INFORMATION TECHNICAL SERVICES



* Utah Based Positions

4/25/89

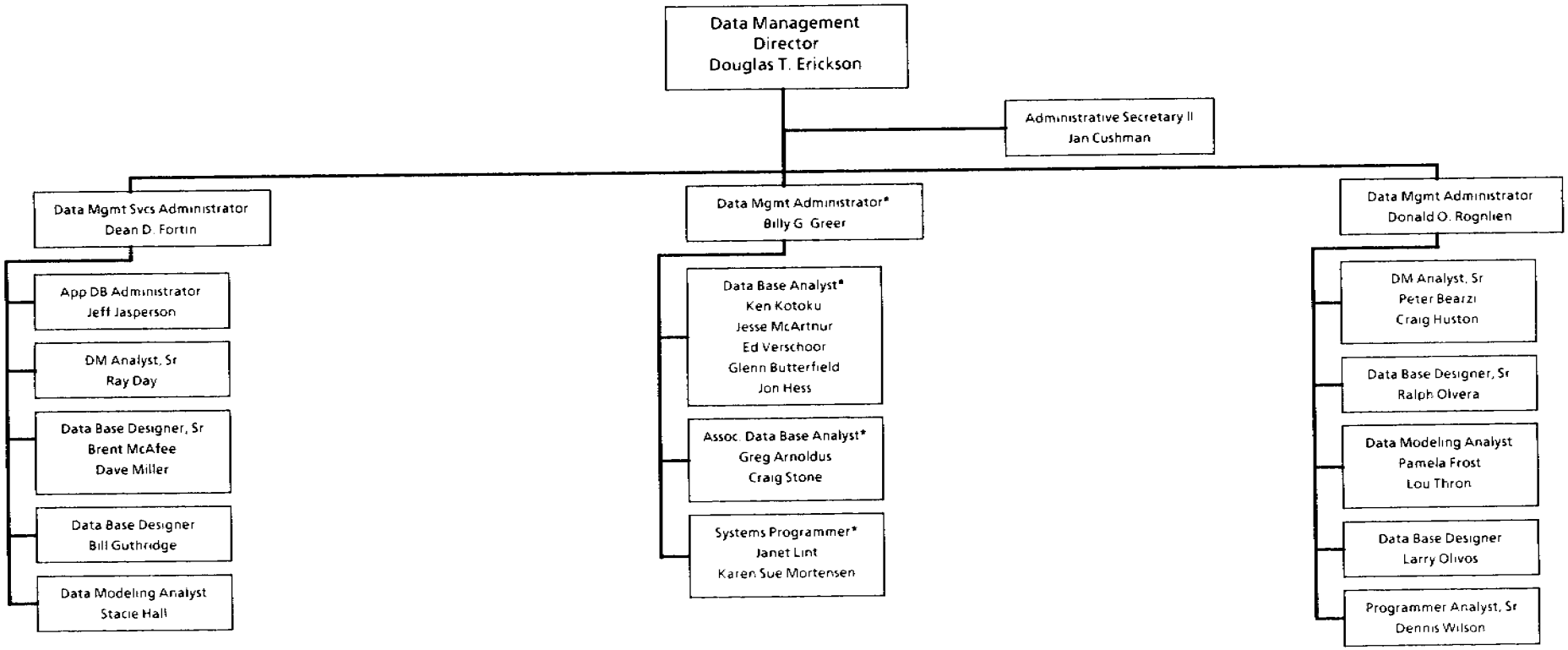
INFORMATION MANAGEMENT
INFORMATION PLANNING



\+ Location to be Determined
* Utah Based Position

4/25/89

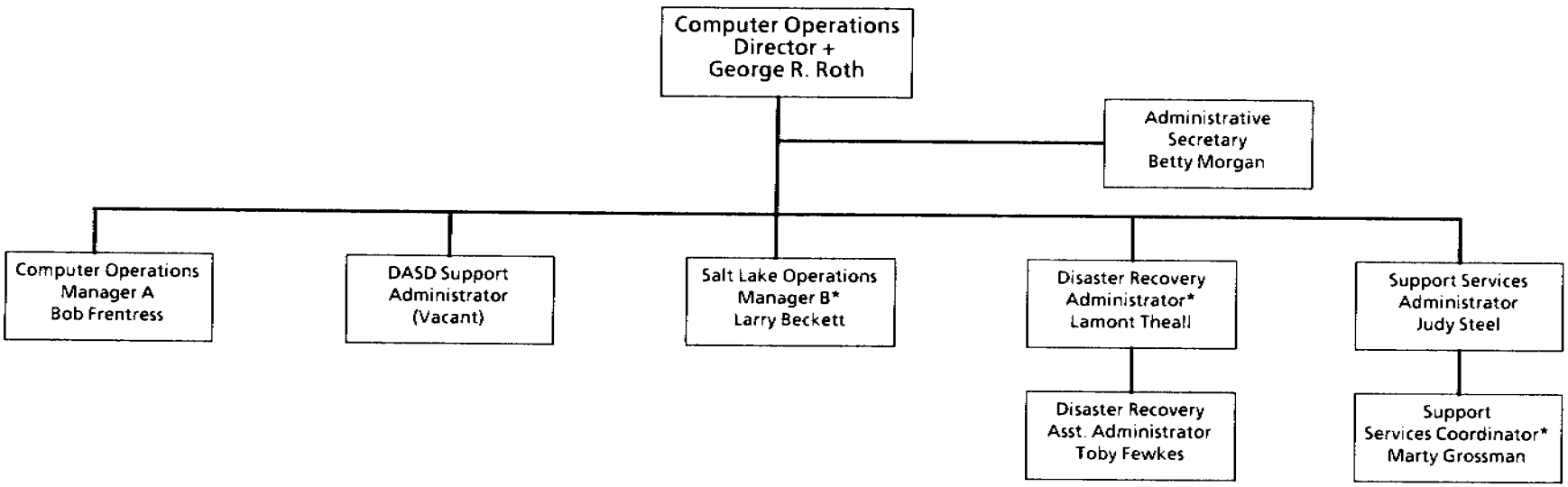
INFORMATION MANAGEMENT
DATA MANAGEMENT SYSTEMS



* Utah Based Positions

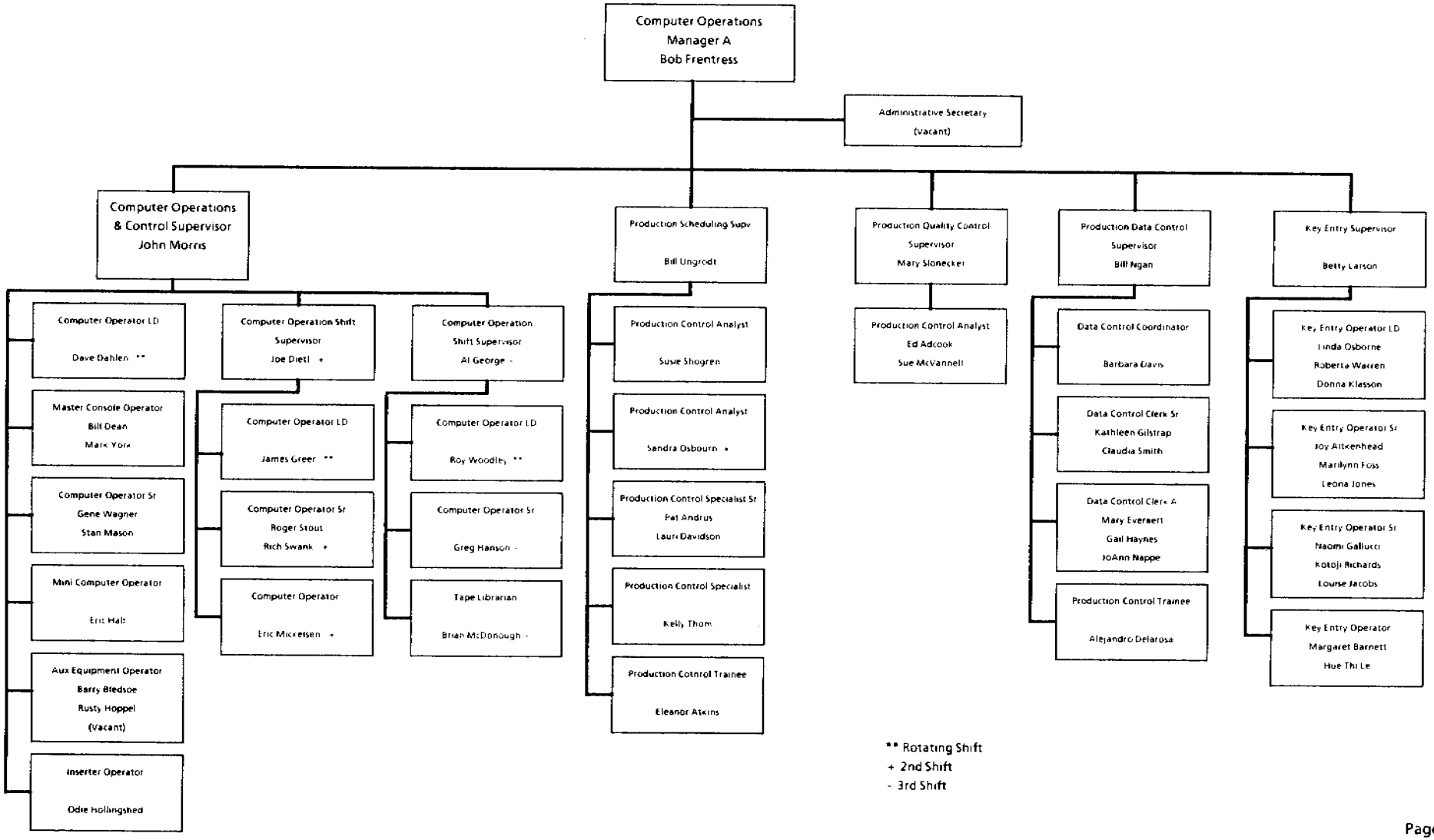
4/25/89

INFORMATION MANAGEMENT
COMPUTER OPERATIONS



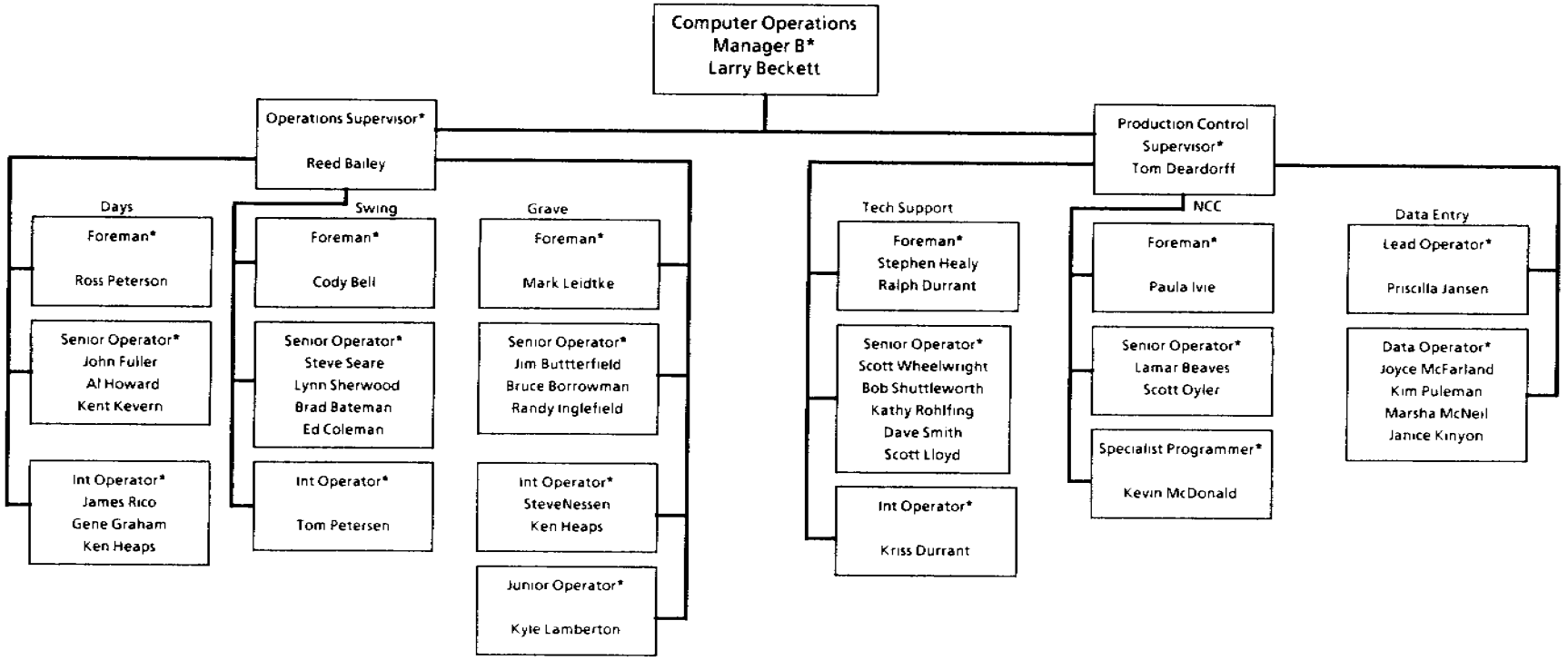
* Utah Based Positions
\+ Location to be determined

INFORMATION MANAGEMENT
COMPUTER OPERATIONS - PORTLAND



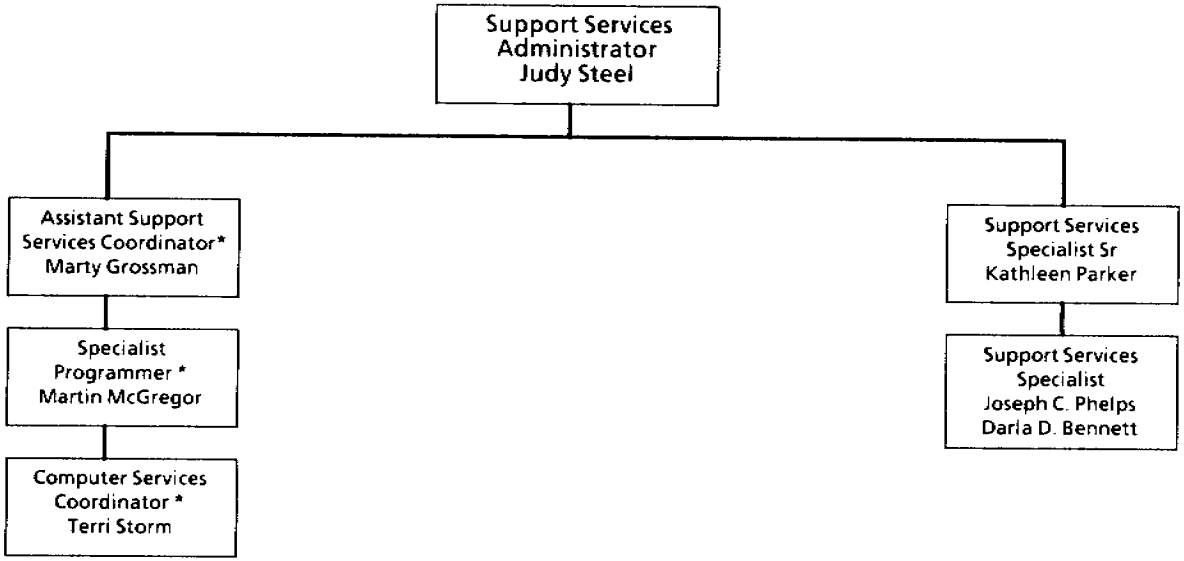
** Rotating Shift
+ 2nd Shift
- 3rd Shift

INFORMATION MANAGEMENT
COMPUTER OPERATIONS - SALT LAKE



* Utah Based Positions

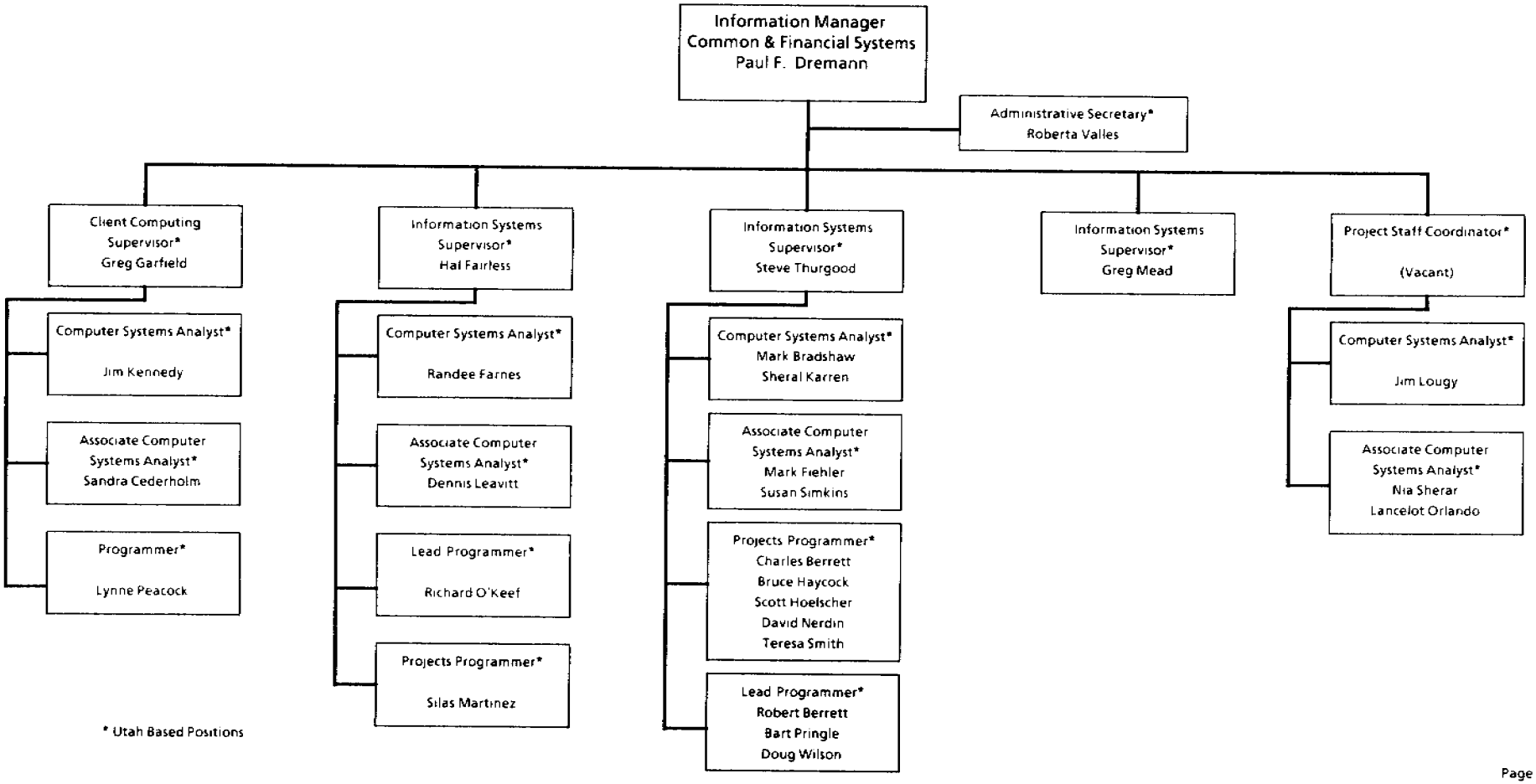
INFORMATION MANAGEMENT
COMPUTER OPERATIONS SUPPORT SERVICES



* Utah Based Positions

4/25/89

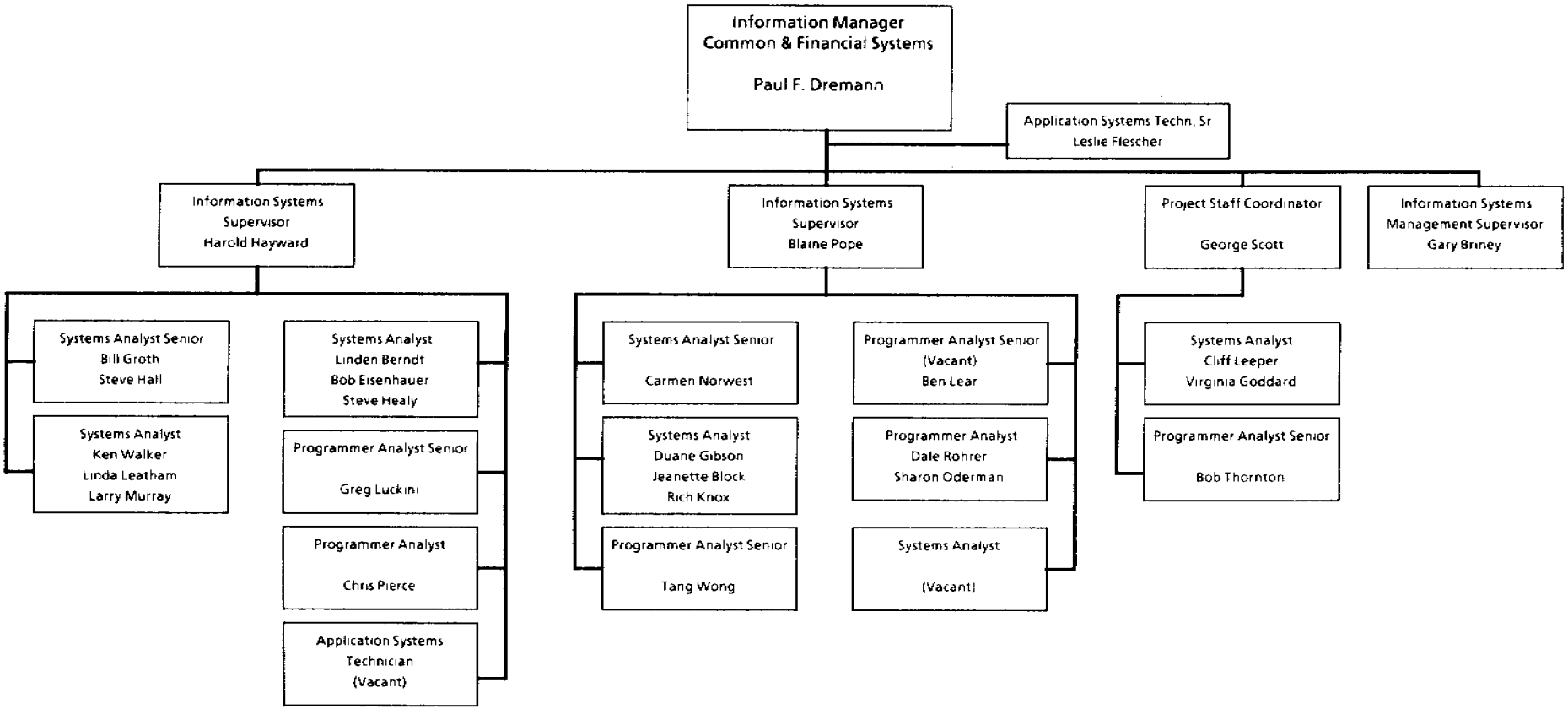
INFORMATION MANAGEMENT
COMMERCIAL & FINANCIAL SYSTEMS



* Utah Based Positions

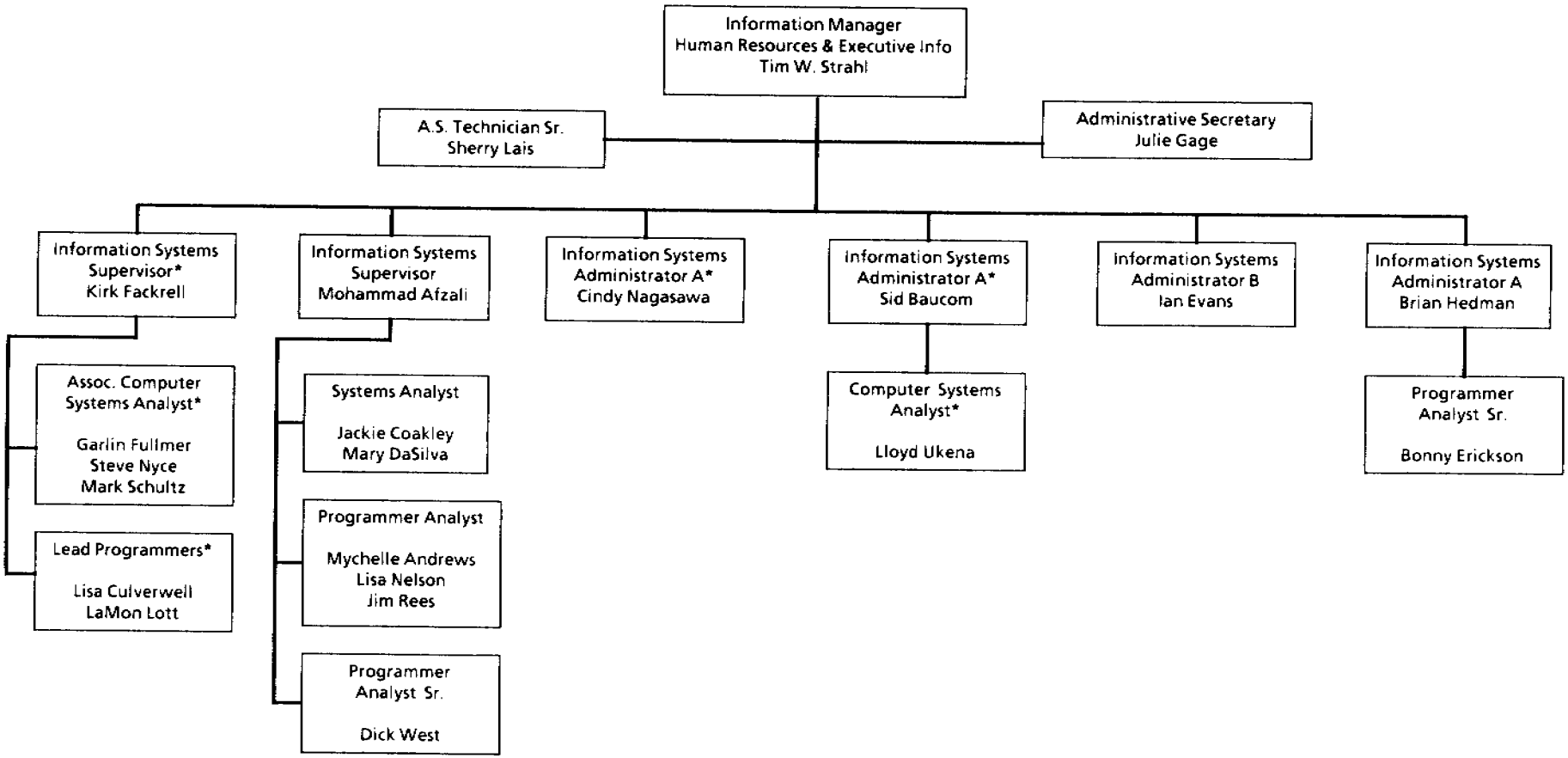
4/25/89

INFORMATION MANAGEMENT
COMMERCIAL & FINANCIAL SYSTEMS



4/25/89

INFORMATION MANAGEMENT
HUMAN RESOURCES/EXECUTIVE INFORMATION SYSTEMS



* Utah Based Positions

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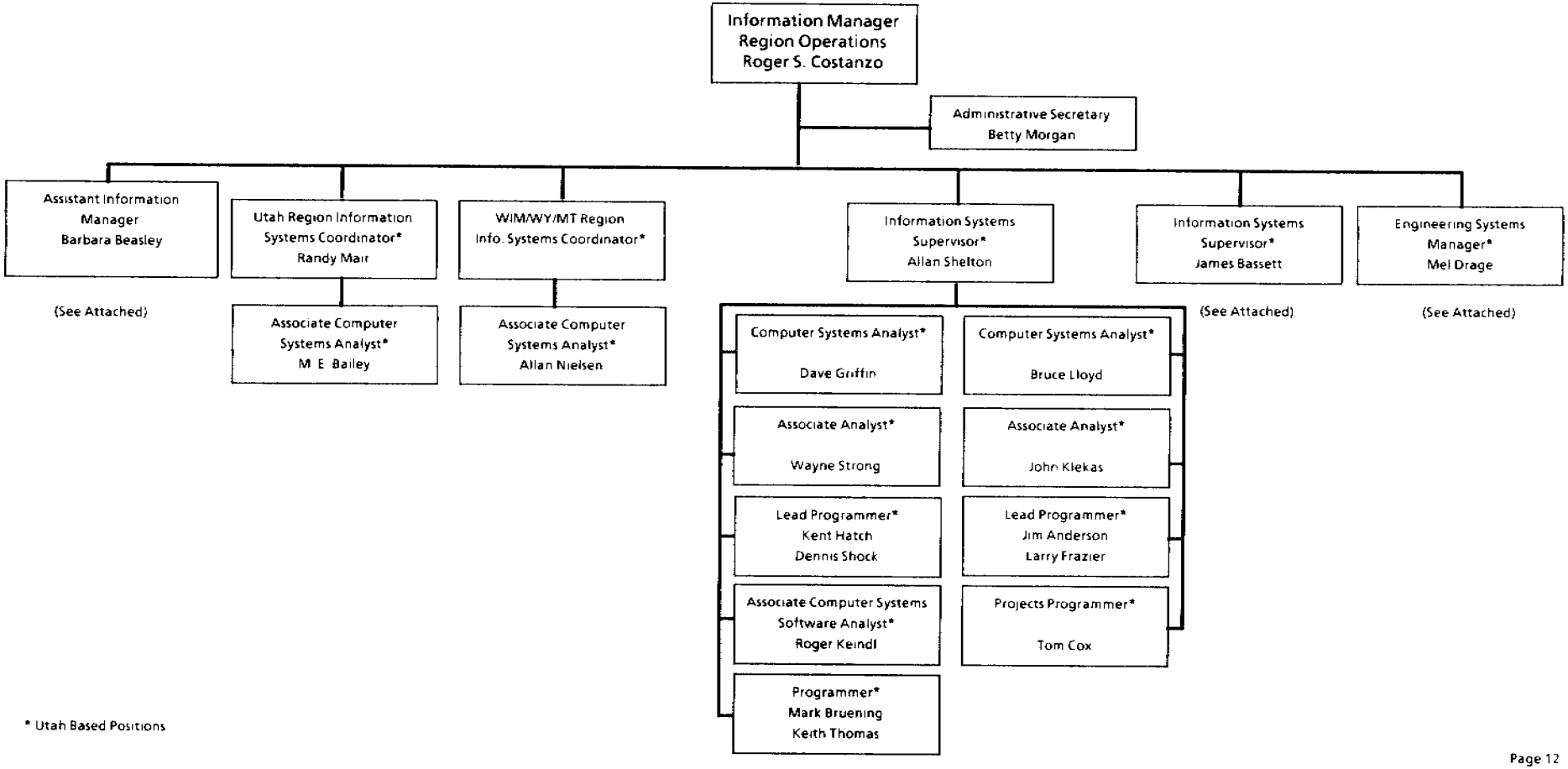
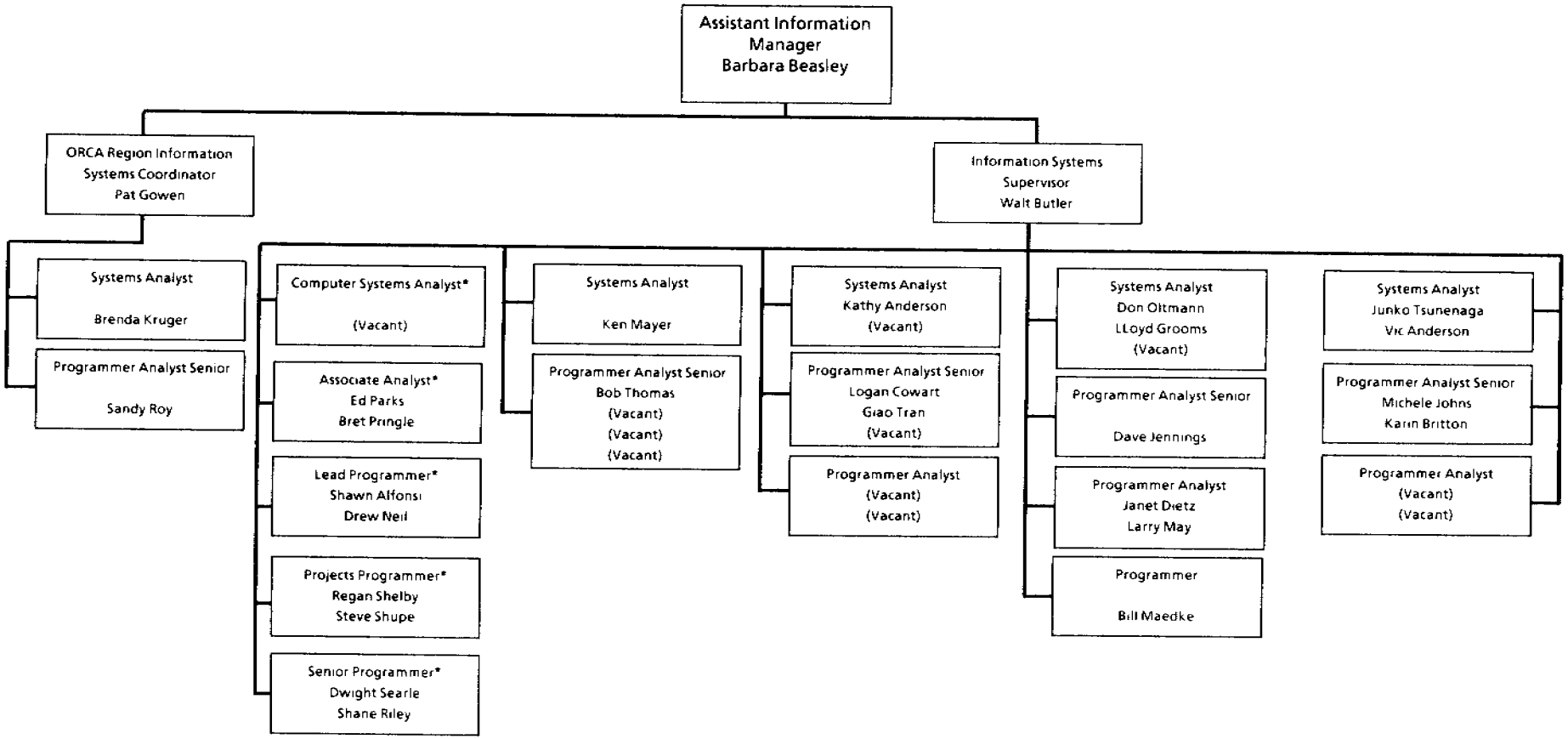
INFORMATION MANAGEMENT
REGION OPERATIONS



* Utah Based Positions

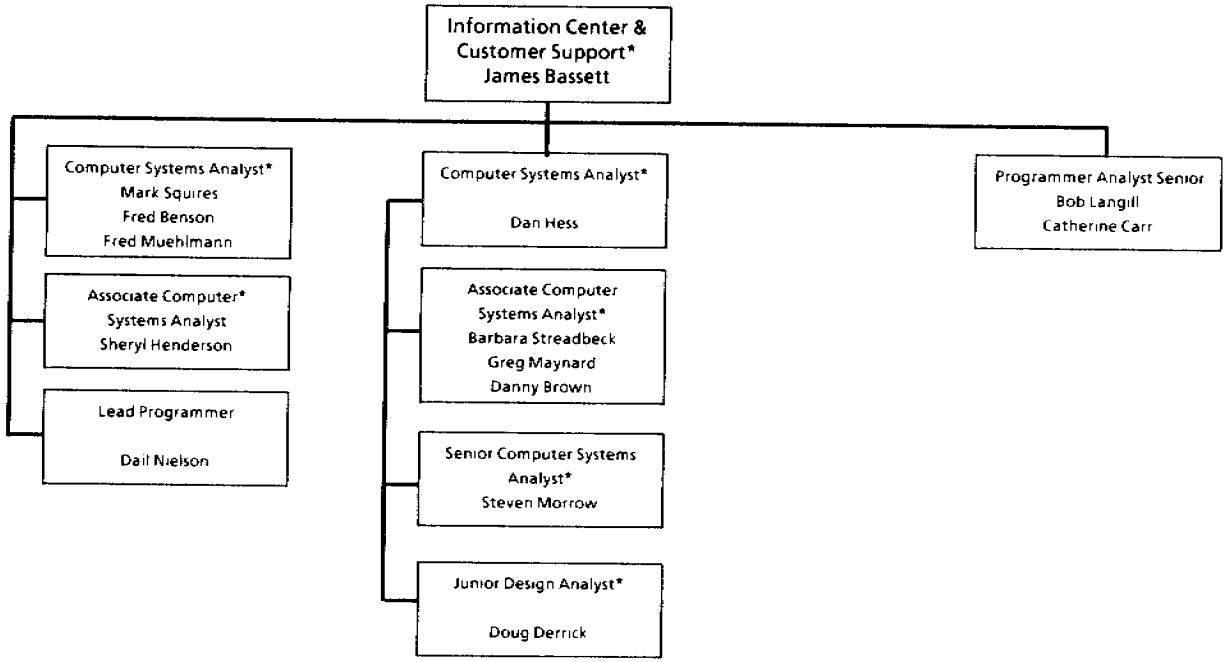
4/25/89

INFORMATION MANAGEMENT
REGION OPERATIONS - PACIFIC DIVISION



* Utah Based Position

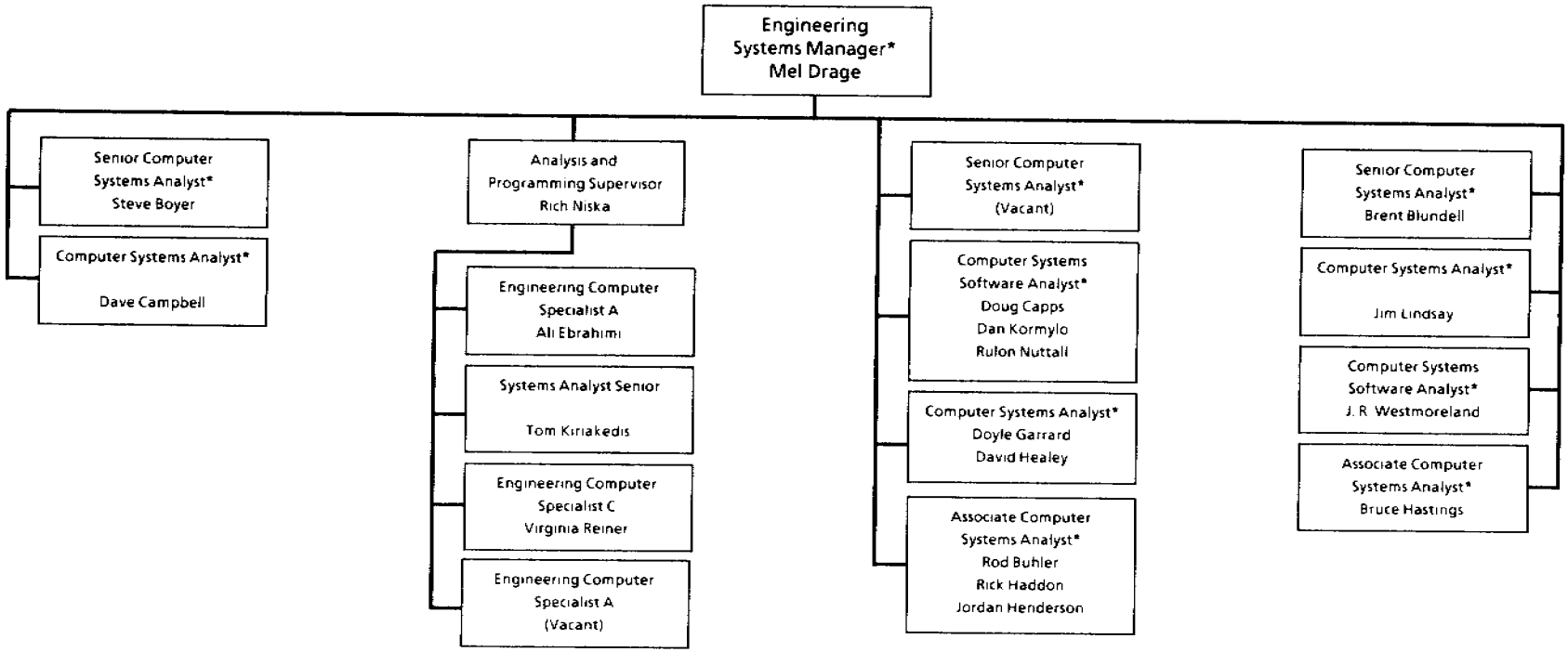
INFORMATION MANAGEMENT
REGION OPERATIONS
INFORMATION CENTER & CUSTOMER SUPPORT



* Utah Based Positions

4/25/89

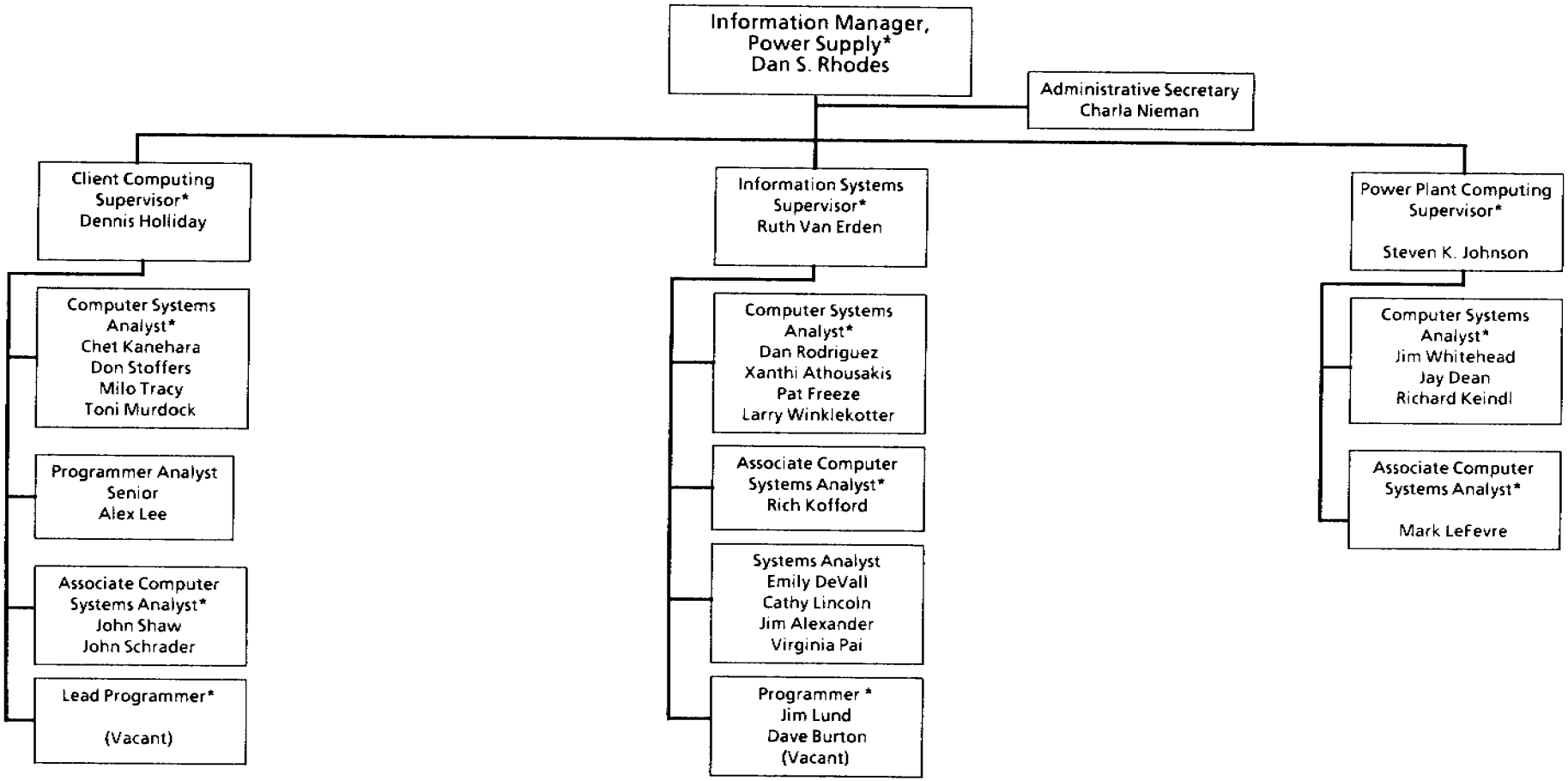
INFORMATION MANAGEMENT
REGION OPERATIONS - ENGINEERING SYSTEMS



* Utah Based Position

4/25/89

INFORMATION MANAGEMENT
POWER SUPPLY



* Utah Based Positions

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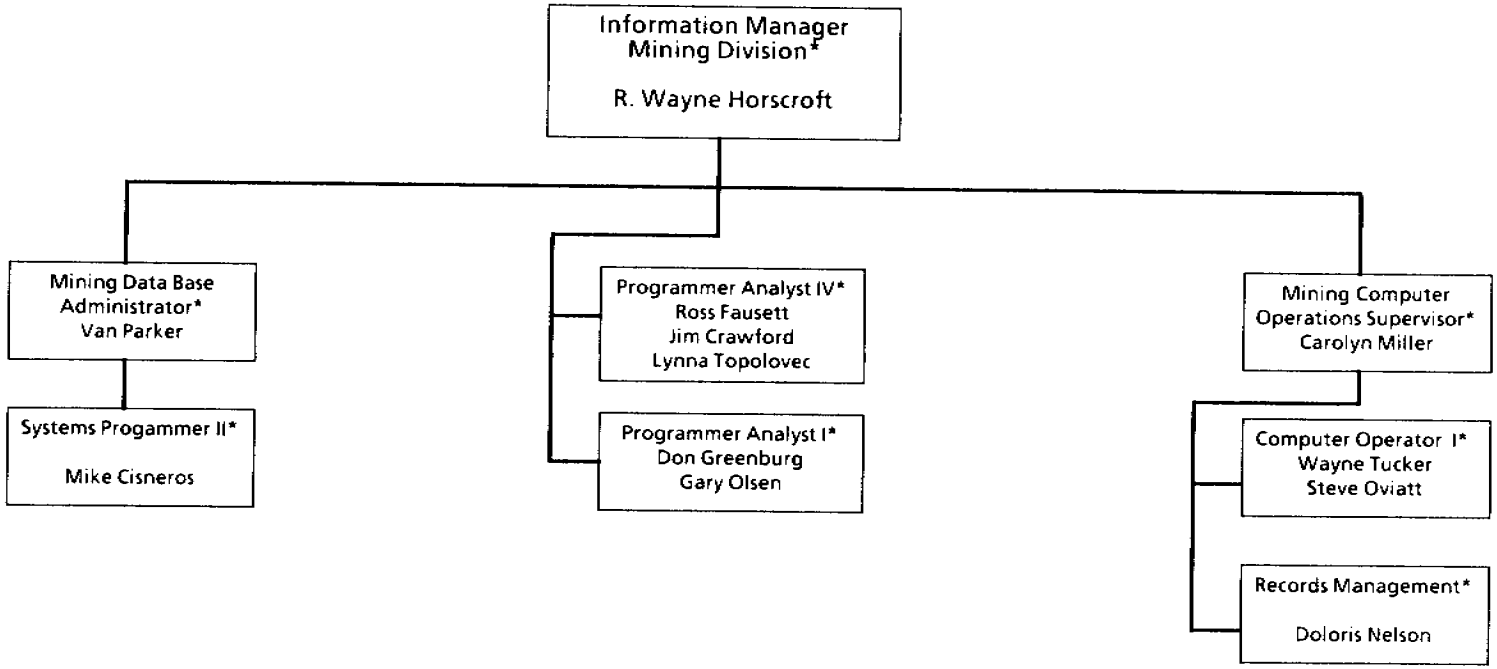
INFORMATION MANAGEMENT
MINING DIVISION



* Utah Based Positions

APR 2 5 1989

PACIFIC AND UTAH POWER
DATA CENTER STUDY

DATA CENTER STUDY

EXECUTIVE OVERVIEW

One Data Center or Two?

A single location for the operation of mainframe computers is the most economical solution. A consolidated data center will provide savings of approximately $8 million NPV over 6 years, by decreasing software licensing costs to a reduced number of machines, and reducing direct manpower by 28 employees for equivalent computing capacity. The savings are documented in the attached cost summary.

Other benefits include:

- Elimination of fragmentation of capacity over two centers (underutilization)
- Increases the availability of data across divisions and applications
- Reduces time and cost to consolidate to a single technology
- Eases migration of applications
- Decreases manpower for maintenance, and coordinating maintenance
- Simplifies implementation of new technology
- Decreases cost/complexity for disaster recovery

Requirements / Design Criteria

- Transparent to applications (those using applications will not see a change other than faster response)
- Equal or improved response time
- No delays experienced by any Application Conversion Team
- Equal or improved data integrity, access and control
- No cost to any clients for additional system equipment, licenses, etc.
- Minimum life cycle cost to meet our computing needs taking into account forecast needs
- Minimum operating complexity
- Manpower savings in accordance with transition team studies
- Release manpower as early as possible to provide displaced employees optimal opportunity to take advantage of openings during transition.

Optimal Configuration

The ideal hardware configuration is to run a single large processor (IBM 3090-600E or equivalent), with high-density disk storage. Input, printing, and network control at the satellite site is provided through communications technology in common use. This will result in the lowest annual OPERATING cost because of the following:

1. Lowest hardware maintenance cost
2. Software is licensed on a per machine basis
3. Simplified environment requires lowest manpower effort to operate/maintain.
4. Lowest floor space and physical support requirement

The downside to the ideal configuration is the considerable capital expense. Because of this high up front expense, and given the current mix of hardware available from each location, we recommend an interim solution of two processors, an IBM 3084 and an upgraded 3090-200E to a 400E, running existing operating systems. By keeping the 3084, annual operating costs will be approximately $110,000 more than a 600E scenario of equal capacity, but will require $3,200,000 less capital. Partitioning software will be required during the consolidation process, until all applications can be converted to run on a common operating system.

Where should the data center be located?

If the single computer installation were to be built from scratch, utilizing new (to the company) equipment, there would be only minor technological reasons for locating the data center in either Salt Lake or Portland, or anywhere in between which has access to adequate communication lines. However, since each division of the company has a significant investment in hardware, software, professional staff, and the physical site, the lowest cost option to the company is use one of the existing sites, and add enough computing capacity there to handle the needs of both divisions.

A Portland based data center is clearly the lowest cost, most flexible solution for the following reasons:

1. Interruptions to operations is limited to a single weekend versus 5 consecutive days plus a minimum of two additional weekends.
2. Simplicity - an upgrade of an existing facility with on-site technology
3. Moving and processor upgrade savings of $500,000
4. Flexibility of current configuration
5. Reduced risk of data and equipment loss
6. Reduced personnel relocation costs of at least $760,000 (20 people @ $38,000)
7. Adjacent floor space made available for Power Dispatch Center and/or Distribution Dispatch Center in Salt Lake.
8. Allows orderly migration without acquisition of interim equipment
9. Due to anomolies in the computer market now, we have a one-time opportunity to take advantage of a computer swap, (our 200E for a 400E), producing a net benefit of over $1.6 million NPV over 6 years. This is only possible if Portland is the center because the 200E must be released when the 400E is installed.

Title	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Manpower Operation	(21)	0	0	0	0	0
Manpower Tech. Svc	(7)	0	0			
Manpower Operation $	$693,000	$713,790	$735,204	$757,260	$779,978	$803,377
Manpower Tech. Svc $	$364,000	$374,920	$386,168	$397,753	$409,685	$421,976
IBM Software	$573,000	$641,760	$718,771	$805,024	$901,627	$1,009,822
Software Other	$50,000	$56,000	$62,720	$70,246	$78,676	$88,117
Maintenance	$250,000	$262,500	$275,625	$289,406	$303,877	$319,070
DB2 environment UP&L	$100,000	$112,000	$125,440	$140,493	$157,352	$176,234
Interlink UP&L	$280,000	$45,000	$50,400	$56,448	$63,222	$70,808
Oracle products UP&L	$350,000	$30,000	$33,600	$37,632	$42,148	$47,206
Disaster Recovery	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000
Computer depr.	(735,000)	(735,000)	(735,000)	(735,000)	(735,000)	(735,000)
Savings	**$2,045,000**	**$1,620,970**	**$1,772,928**	**$1,939,262**	**$2,121,563**	**$2,321,610**
NPV at 11.5%	**$8,100,000**					

Manpower: There is a savings of about 21 people in operation and 7 people in Technical Services by data center consolidation. The Dollars are calculated as 21 people at $33,000/yr and 7 people at $52,000/yr including avoidable overheads.

IBM Software: This is software rental from IBM that will be reduced by reduction of CPUs with the data center consolidation. The software cost is escalated by 12% per year as the current trend indicates.

Software Other: This is the maintenance on software that is not on rental. There will be a reduction in maintenance due to data center consolidation. It is escalated by 12% per year

Maintenance: This is the net reduction of maintenance on equipment associated with the data center consolidation. It is escalated by 5% per year.

Rationale

Installed Technology

Mainframe

Most Salt Lake hardware is obsolete and should be sold before it depreciates further. The current five CPU complex in Salt Lake (and subsequent five software licenses), should be consolidated, with the Pacific workload, into a single larger CPU. This will require an initial upgrade cost of about $3,200,000 which will provide savings of approximately $8 million NVP over 6 years. This savings is realized by decreasing software license costs to a reduced number of machines and site by a reduction of direct manpower cost of 28 employees and a reduction in software license costs and hardware maintenance costs by over $975,000 per year for an equivalent computing capacity. The 3090-200E processor in Portland is current technology and can be expanded to well beyond the capacity currently needed by both divisions combined. The 3084 in Portland is obsolete, but can perform twice the amount of work for the same software license costs as can the 3081. We can continue to operate the 3084 out of Portland without necessitating a processor upgrade from a 400E to 600E saving a $3,200,000 capital expenditure. No cost effective solution exists for moving it to Salt lake due to interim capacity issues. The 3090-400E is partitionable into two physical processors should the need arise to run physically separate operating systems. This will allow Information Management to retain flexibility in the near term when it come to the amount of capital outlay required to consolidate the 5 Salt Lake CPUs. This flexibility will be important until the detailed analysis of consolidating applications, data set naming conventions, and security needs is complete.

Peripheral Equipment

The tape storage units of both locations are functionally equivalent. Some of the newer 3480 tape cartridge units should be moved to the chosen site. The older reel units at the vacated site can probably be sold. Tapes are essentially a non-issue.

The 3800 laser printing systems are also functionally equivalent. Each site has two of the same model installed. It is anticipated that at least one will remain at each location regardless of the site chosen. At least one, or possibly two, can be sold. There are also a few line printers at each location. Printers are another non-issue, except that it is anticipated that each division will continue to perform their own printing (of bills, checks, payroll, etc).

There is a major difference in the disk storage configuration at each site. The 3350 storage devices at Salt Lake have no salvage value, except as trade-in units in purchasing new "K" boxes. They have no value on the secondary market because the maintenance costs are about 4 times the cost of 3380 devices per megabyte of storage capacity. They are also slow and require a huge amount of floor space. The 3880-1 controller to which some of these 3350s are attached should be sold. Upgrade costs are roughly equivalent to purchasing a new one.

The 3380 "standard" (AA4 and B04) single density drives at each site (Salt Lake has 9 and Portland has 6) are obsolete, but functional. Their performance is fairly slow, and they will require more manpower to keep tuned due to their internal substring wiring scheme. They require 3 times the floor space of the new "K" model per megabyte of storage. The ones located in the vacant site should definitely be sold, and the ones in the consolidated site should be sold if economics permit. The same is essentially true of the "D" model 3380s of which Salt Lake has 11 and Portland has 4. While they perform better than the "standards," they also require three times the floor space as "K" models.

The 3380 "E" models hold twice the data per amount of floor space of the single density "standard" and "D" models and perform adequately for many applications. While essentially obsoleted by the newer devices on the market, they should suffice the company's needs in the near future.

Both sites have the new "K" model triple density devices installed. Salt Lake has 6 boxes (24 volumes) and Portland has 10 boxes (40 volumes) installed. These should be retained regardless of site.

The Portland DASD controller configuration is positioned so as to allow a large addition of disk capacity without installing additional controllers. Portland has two 3990 cache controllers which allow very fast I/O operations and are clearly the direction the industry will pursue. Salt Lake has a 3990 (non-cache) controller which should be retained for use with "K" DASD. Salt Lake's 3880-13 cache controller is obsolete. While it has no salvage value on the secondary market, it may have some use in specialized processing. The other storage controllers are the same in each division.

Moving Costs

The cost of moving the Portland hardware to Salt Lake is about $150,000. The cost of moving the 3380 DASD units in Salt Lake is about $40,000.

Upgrade Costs

If the 5 CPU complex in Salt Lake were to be consolidated onto an upgraded 3090-400E, there would be an annual savings of $823,000 in hardware and software costs from IBM alone (see attached Appendix 1). In addition, costs for software maintenance from other vendors would be reduced by about $50,000 per year. Capital outlay required to upgrade the 3090-200E to a 400E is $3,200,000. This assumes a resale value of $500,000 for the Salt Lake hardware which would not be kept. There will be additional revenue from OEM hardware in the vacated site which can be sold (air conditioning, water chiller, etc). The additional revenue has not been identified at this time. Additionally, there would be a drop in direct labor cost of 28 people regardless of location. It is anticipated that labor requirements for the combined company's computer operations will drop further due to having fewer mainframes, and implementing automated operation technology.

- Savings on hardware and software $873,000
- Savings on manpower 28 positions
- Capital outlay $3,200,000

Another alternative is to upgrade a 3090-400E to a 600E at an additional upgrade cost of about $3,200,000 to replace Pacific's 3084. A resale price for the 3084 of $525,000 is expected. Software and hardware costs from IBM for the 3084 would drop by $173,000 per year. There would be no additional savings on manpower (beyond that identified above) with this option.

- Savings on software licenses on 3084 $100,000
- Savings on hardware maint. on 3084 $103,000
- Increase in maintenance 400E to 600E $30,000
- Net Savings $173,000
- Capital outlay $3,200,000

It is recommended that the 3084 be retained in conjunction with a 400E in the near future to keep the capital requirements to a minimum during the consolidation period and because it can be partitioned into multiple operating systems.

The Portland site offers opportunity for savings in interim hardware and software costs. A 3090 "staged" in Salt Lake, while the current 3090 was still in Portland, would require additional software licenses for the

duration of the move. An upgraded Portland 400E would not incur this additional cost of approximately $23,000/month.

Other Options

Several options and scenarios were considered. Some appear to be workable and are documented below in some detail. They are not recommended because of costs, efficiencies, or complexity. Other options were discarded after analysis proved them to be unworkable. They are also included below in a more abbreviated format, with the reason for rejection.

The most economical solution is a single large computer center (with as few machines as possible) and a satellite site in the other location. There must be a phased approach in moving equipment, making sure that enough capacity already exists in the new site to hold whatever workload is to be moved from the old site. If this philosophy is not followed throughout the consolidation, additional outage will occur. This is true for both mainframe and peripheral equipment.

Keep 3081 in Salt Lake, 3084 and an upgraded 3090 in Portland

The 3081 would provide VM services for the current Pacific users. It would handle network and printing requirements and eliminate any need to change the configuration of Salt Lake channel attached terminal controllers. The hardware maintenance costs for the 3081 and 2 stings of DASD would be about $70,200 per year. VM software costs would be an additional $95,262 per year. Additional manpower of two computer operators and one system programmer are expected due to the increased complexity and software maintenance.

• Cost of 3081 hardware maint	$70,200
• Cost of 3081 software	$95,262
• Additional manpower	$130,000
• Total annual costs of keeping 3081	$295,462

In addition to the higher operating costs and complexity, this was rejected due to fragmentation of capacity. No workload exists which can operate on an isolated machine (no data sharing) in the remaining capacity under the VM operating system.

Keep 4341 in Salt Lake as network and print server

This is an option only if the IBM 3737/T1 network option is replaced with a Network System/T1 option. The cost of hardware and minimum software on a 4341 M12 is $42,000/year, but provides no additional functionality or benefits.

Install 9377 in Salt Lake as network and print server.

This will cost $31,000/year for software and hardware, but provide no additional benefits.

Use Portland 3090 in upgrading a Salt Lake 3090.

This option assumes Salt Lake is the chosen site. If this option is selected, one of the following two scenarios is applicable.

1. There will be a 4 to 5 day outage for the entire Pacific Division. It will take at least 36 hours to de-install, crate, and load onto a truck the various pieces of the Portland data center complex to be used in Salt Lake. It will take an additional 18 hours of driving time to get to Salt Lake. There will be additional two days to reinstall the equipment and load data. This represent a significant 5 day period where all Pacific Division applications are down.

2. The other option is to duplicate the Portland environment (hardware and software) in Salt Lake and sell the Portland hardware, which is current technology, at a loss. This was not cost effective, since there were no other benefits.

Only by keeping the installed 3090 in Portland as the base processor can hardware from other data center be used to enhance an existing data center without causing significant outage to one division or the other. The 3090-200E in Portland must be base machine for the upgrade migration to occur at the lowest cost and to avoid a long outage to the company's automated business functions. In Portland, upgrade can be performed during scheduled weekend maintenance period eliminating outages to user departments. The Portland site can hold the additional equipment required without any problems. The Salt Lake site does not have sufficient physical space to stage the required hardware to support the pacific workload. The following chart shows costs for creating a 400E complex in each site.

Create 3090-400E using Portland's 3090

• IBM 3090-200E installed in SL	$3,200,000
• Moving Costs	$150,000
• Upgrade cost using Portland 3090	$350,000
• Five day outage+ increased risk	(see Appendix 2)
• Total Cost	$3,700,000 + Outage

Upgrade 3090-200E to 400E in Portland

• Total Costs	$3,200,000

Network Options

Several solutions to data communications between the division were explored. All require a T1 communications line link between locations at a cost of $84,000/year which should be added to each configuration costs. The major differences center on the hardware to which the T1 connects and the inclusion of an IBM processors to handle communications control in the satellite site. In the case of processors within an option, the cost included is an annual recurring cost.

The first option is recommended. It is the lowest cost solution and is also a system which will position the network for the future as inter-division communications requirements mature.

Recommendation

A) Use Network System Hyperchannel(upgrade 3725 & 3274)

• Cost of Hyperware in satellite site	$84,000
• Cost of Hyperware in primary site	$49,900
• Upgrade to 3725 satellite site	$55,000
• Upgrade to 3274s	$27,000
• Total	$216,400 +33,000/yr

Other Options Evaluated

B) Use IBM 3737 hardware to connect two mainframes

• Cost of IBM 3737	$140,000
• Mainframes(annual costs)	$31,000 to $162,000
• TOTAL	$140,000 + $31,000 to 162,000/yr

C) Use Network system Hyperchannel (no 3725/3274 upgrade)

• Cost of hyperware in Satellite site	$176,000
• Cost of hyperware in primary site	$49,000
• Total	$225,925 + 49,152/yr.

Moving Risks

There are risks involved with this project regardless of location. There are some risks, however, which the company can minimize by selecting the Portland site

It is economical to use the existing the 3090-200E in whatever location is chosen. Given that it is seen as the cornerstone of new environment, why move it? Things, usually bad things, happen when equipment is moved. Recently a truckload of disk devices were heavily damaged during transit when a strap broke. The loose drive proceeded to damage the other equipment in the van as it slid around inside. The problem was not detected until the equipment was unloaded. The equipment was insured, but required several week to repair. Any move of equipment leaves us open to this type of problems. The 3090 is a critical resource and should not be subjected to this risk. If the 3090 remains in Portland there will always be a "hot" backup in place should some problem occur. Under this scenario the old machines will remain in Salt Lake until we are sure it is safe to de-install them. If the 3090 is moved, our only backup would be our disaster recovery site.

A phased move, doing one machine at a time, obviously has least risk. There is only a subset of the user community and business applications likely to suffer an outage should something go wrong simply because there are fewer users and applications running on a single machine. Moving the smaller Utah machines to Portland results in a significant reduction risks because consolidation will occur over 5 smaller machines.

APPENDIX 1

Utah Power Hardware Resale Values

Machine	Qty	End User Purchase	Total End User Purchase	End User Sale	Total End User Sale
4341-M12	1	$3,500	$3,500	$2,500	$2,500
4341-M02	1	1,500	1,500	500	500
3081-K48	1	245,000	245,000	225,000	225,000
3380-AE4	3	49,500	148,500	46,500	139,500
3380-AD4	3	13,500	40,500	11,500	34,500
3380-BE4	1	41,250	41,250	38,750	38,750
3380-BD4	8	9,000	72,000	7,000	56,000
3380-AA4	5	4,500	22,500	3,300	16,500
3380-B04	4	3,400	13,600	2,200	8,800
3880-001	3	5,300	15,900	4,000	12,000
3880-003	6	9,000	54,000	7,000	42,000
3420-006	4	700	2,800	100	400
3803-002	2	5,000	10,000	3,600	7,200
3480-A22	2	44,500	89,000	41,500	83,000
3480-B22	6	23,750	142,500	21,250	127,500
3800-003	2	130,000	260,000	120,000	240,000
4245-020	1	24,500	24,500	21,500	21,500
TOTAL			**$1,187,050**		**$1,055,650**

SOURCE: January 1989 "Computer Price Watch"

Note: The prices quoted are not guarantees, but provide an estimate as to current value on the used market.

Utah Power Hardware Maintenance Costs

MACHINE	MODEL	MONTHLY CSA	QTY	MONTHLY TOTAL	ANNUAL TOTAL
3033	U16	$5,316.70	1	$5,316.70	$63,800.40
3033	N16	4,955.27	1	4,955.27	59,463.24
3036	001	316.79	2	633.58	7,602.96
3037	001	152.47	2	304.94	3,659.28
4341	M12	1,007.25	1	1,007.25	12,087.00
4341	M02	910.87	1	910.87	10,930.44
3081	K48	4,238.35	1	4,238.35	50,860.20
3082	016	692.83	1	692.38	8,308.56
3087	001	54.51	1	54.51	654.12
3350	A02	161.53	4	646.12	7,753.44
3350	B02	116.13	9	1,045.17	12,542.04
3380	AE4	239.37	3	718.11	8,617.32
3380	AD4	239.37	3	718.11	8,617.32
3380	BE4	174.59	1	174.59	2,095.08
3380	BD4	174.59	8	1,396.72	16,760.64
3380	AA4	263.86	5	1,319.30	15,831.60
3380	B04	195.13	4	780.52	9,366.24
3880	001	147.73	3	443.19	5,318.28
3880	003	147.73	6	886.38	10,636.56
3880	D13	514.29	1	514.29	6,171.48
3420	006	300.99	4	1,203.96	14,447.52
3803	002	198.00	1	198.00	2,376.00
3803	002	186.00	1	186.00	2,232.00
3480	A22	376.83	2	753.66	9,043.92
3480	B22	214.09	4	856.36	10,276.32

3480	B22	246.48	2	492.96	5,915.52
3800	003	1,176.00	1	1,176.00	14,112.00
3800	003	1,158.75	1	1,158.75	13,905.00
4245	020	329.60	1	329.60	3,955.20
3505	B02	384.80	1	384.80	4,617.60
3525	P02	543.20	1	543.20	6,518.40
3814	A02	168.27	1	168.27	2,019.24
3814	C02	124.03	1	124.03	1,488.36

TOTAL ***$348,182.88***

	148
SMP/E	438
	328
Assembler	162
	121
	121
	121
	121
TSO Cobol Prompter	28
TSO Assembler Prompter	29
TSO Fortran Prompter	32
	32
	32
Fortran IV Compiler	98
	98
	73
	73
Fortran Debug	268
	268
Fortran IV	137
	98
	98
	98
PL/1 Library	28
PL/1 Optimizer	417
TSO Data Utilities	154
	154
	154
	154
	154
VS Fortran Compiler	261
	195
	195
	195
	195
DCF	403
TSO PCF	54
	54
3277 Graphics Attach	150
Cobol Compiler	383

	286
	286
	286
Sort/Merge	259
	194
	194
	194
	194
MVS/XA	4,490
MVS/SP	1,705
	1,690
	1,690
	2,276
Stairs	1,340
Data Dictionary	1,165
CICS OS/VS	2,005
RMF	426
	319
	319
	319
TOTAL	$47,830

Total Annual Savings ***$573,960***

Note: The above software products represent current licenses that would not be required if the Salt Lake and Portland data centers were consolidated.

APPENDIX 2

International Business Machines Corporation

Pacwest Center - Suite 1000
1211 South West Fifth Avenue
Portland, Oregon 97204-3798
503/294-6700

March 17, 1989

Mr. Tim Malamphy
Pacific Power & Light
920 SW Sixth Avenue
Portland, OR 97204

Dear Tim:

In response to your request, IBM is pleased to provide cost estimates for IBM's Customized Operational Services (COS).

IBM's COS are services that are provided by our National Service Division. These offerings include Site Planning, Cabling, Data Center Evaluation and Design, and Relocation.

The estimated cost for relocation of PP&L's Data Center equipment to Salt Lake City is $145,000. This estimate includes the 3090-200E and 3084 processors, dasd/controllers, tape, printers, and communications controllers. Services include project management, mover services, hardware disconnect, packing and reinstallation. If the 3084 were not included in the move, the estimated cost is $125,000 to $135,000.

We anticipate this move would take a minimum of 5 days, potentially longer. This timeframe includes 1 - 1 1/2 days to pack and load the equipment in Portland, 1 1/2 days travel to Salt Lake, 1 day to unload and unpack in Salt Lake, and 1 1/2 - 2 days to reinstall and test.

The cost of relocating Utah Power's dasd in Portland is approximately $43,000. This includes all of Utah's dasd/controllers, except the 3350's. We anticipate this move would take 2 days.

The prices and timeframes stated are for your information only and are subject to change. A firm price quotation will be provided prior to the start of a project.

IBM's Customized Operational Services provide complete support for your information systems requirements, and could prove to be very beneficial in your data center consolidation efforts. Please contact me if you have any questions.

Sincerely,

Ann M. Mueller

Ann M. Mueller
Account Marketing Representative

kj/E:02.03

Attachment