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Assessment of the Electrical Power Requirements for Continued Safe Storage and Waste Feed Delivery Phase One

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Abstract:

This study evaluated the ability of the electrical distribution system to support safe storage as well as the first phase of the Waste Feed Delivery. Several recommendations are made to improve the electrical system.

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**ASSESSMENT OF THE ELECTRICAL POWER
REQUIREMENTS FOR CONTINUED SAFE
STORAGE AND WASTE FEED DELIVERY
PHASE ONE**

January 2000

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ACRONYMS

ANSI	American National Standard Institute
DST	Double-shell tank
ECN	Engineering Change Notice
HVAC	Heating, Ventilation, and Air Conditioning
IEEE	Institute of Electrical and Electronics Engineering
LMHC	Lockheed Martin Hanford Corporation
MCC	Motor Control Center
NEC	National Electric Code
SST	Single-shell tank
TWRSO&UP	Tank Waste Remediation System Operations and Utilization Plan
WFD	Waste Feed Delivery
WRF	Waste Retrieval Facilities

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**ASSESSMENT OF THE ELECTRICAL POWER REQUIREMENTS FOR CONTINUED
SAFE STORAGE AND WASTE FEED DELIVERY (SSTs/DSTs)**

1.0 INTRODUCTION

The ability to assure adequate Waste Feed Delivery (WFD) to the Privatization Contractor's vitrification facility is a key element in the overall Hanford cleanup schedule. An important aspect of this WFD is the availability of sufficient and appropriate electrical power in the single- and double-shell tank farms.

The methodology for performing this review and the results are described below.

2.0 REVIEW METHODOLOGY

This study reviewed the ability of the existing 13.8 kVA transformers to support WFD. Existing power demands were estimated from metered loads with a 125 percent factor [NEC 220-35 (2)]. This study does not provide calculations for acceptability of secondary electrical systems.

The review methodology used for preparing this assessment was to first review the Tank Waste Remediation System Operations and Utilization Plan (TWRSO&UP) HNF-SD-WM-SP-012 to determine the mission of the WFD and then to review the available drawings to determine the current electrical configuration in place at each facility. Interviews were then held with key people to determine the current planning regarding operations and future modifications and to incorporate the results of these interviews with the WFD documentation to summarize future requirements. Finally, the requirements were compared to the existing/planned installations and recommendations were developed. Details of the drawing reviews/interviews and resulting recommendations are shown below.

2.1 Drawing Review

Copies of the latest one-line drawings for each single-shell and double-shell tank farm, electrical utility switching diagrams and distribution maps were obtained from microfilm. Copies of the latest Engineering Change Notices (ECNs) were also used for reviewing the DST farm one-line drawings.

2.2 Interviews

Lockheed Martin Hanford Corporation (LMHC) Electrical Engineers for the DST farms were contacted to obtain information on the present and future requirements for safe storage. The Electrical Engineer for Project W-211, "Initial Tank Retrieval System," was also contacted

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to obtain information on the mixer pumps, transfer pumps, and caustic/diluent systems which Project W-211 are planning to install in the AN, AP, AY, AZ, and SY Tank Farms. Project W-521 will also install similar mixer pumps, transfer pumps, and caustic/diluent system installations in additional tanks in the AN, AW, AY, AZ and SY Tank Farms. The DynCorp Electrical Engineer was contacted for utility metering information and 13.8 kV line loading information. Engineers from Project W-314, "Tank Farm Restoration and Safe Operation," were contacted for information on the proposed ventilation upgrades to the AN, AP, AW, and SY Tank Farms.

2.3 Assumptions

The power required for safe storage and retrieval/transfer of waste in the double-shell and single-shell tank farms was determined by identifying the maximum electrical demand power reading obtained from utility metering over a two year period for each DST farm. The results are shown in Table 2.1. The results are based on the following assumptions:

- The hot water heaters/boilers for the 200 East Tank Farms will be combustion-fired and not electrical like the SY Tank Farm units, as the additional electrical load on line C8-L6 would exceed the line capacity.
- The caustic/diluent flush system electrical power requirements for the new systems will be similar to the design of Project W-211 for the AZ Tank Farm (100 kVA). Caustic/diluent systems are only planned for the AW and AZ Tank Farms.
- The construction power for the Privatization Contractor's facility will be fed from the 13.8 kV line C8-L5 and will not impact the anticipated loads for the tank farms.
- The power for the Cross-Site Transfer Line booster pump is fed from a transformer installed for the booster pump station and will not impact the loads for the tank farm transformers.
- All new pump loads will be running at the maximum horsepower (100 percent load).
- The electrical loads projected by Project W-314 for the Heating, Ventilation, and Air Conditioning (HVAC) upgrades in the AN, AP, AW, and SY Tank Farms will be equal to or less than the existing electrical HVAC loads.
- All electrical loads will operate with a 0.8 power factor (where appropriate).

2.4 Review Results

The specific elements of the review and the results are discussed below.

- **Assessment Item #1 - Assess the electrical power required for continued safe storage of waste in the DSTs.**

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The existing transformers are sufficient to provide power to support safe storage of waste in the DSTs for the AN, AP, AW, AY, and AZ Tank Farms (See Appendix A for locations). The transformer capacity for the SY Tank Farm needs to be increased immediately as the loads include two 500 kW water heaters. The 500 kW heaters were used on an "as needed" basis, but with additional hot water required for saltwell pumping, cross-site transfers, and the transfer from tank SY-101 to tank SY-102, the heaters are needed as a continuous load. This puts an excessive load on the two 500 kVA substation transformers. A new 100-hp. transfer pump was also added for the transfer of waste from tank SY-101 to tank SY-102. One of the existing 500 kW heaters is now being temporarily refed from a bank of three pole mounted 167 kVA transformers (500 kVA) to avoid an additional overload on one of the existing SY 500 kVA transformers after the addition of the 100-hp. transfer pump.

The loads for the AZ Tank Farm and AY-101 include the existing annulus exhaust fans and heaters for tanks AZ-101, AZ-102, and AY-101. These systems have been shut down for maintenance and future upgrades. The anticipated additional loads on the AZ transformer when these systems are returned to operation would be approximately 70 kVA and 30 kVA on the A Tank Farm transformer.

- **Assessment Item #2 - Assess the electrical power required to retrieve waste from the DSTs for Phase 1 WFD, based on the assumption that there would be two 300-hp. mixer pumps operating simultaneously and a concurrent transfer of waste by a 60-hp. transfer pump per tank farm. The power loads will also include estimates of additional power required for support systems.**

The existing 1000 kVA transformers in the AN, AP, and AZ Tank Farms have the capacity to handle the additional load of 663 kVA required for the full load capacity of two 300-hp. mixer pumps and a 60-hp. transfer pump. The addition of the Caustic and Diluent Addition System with a projected 100 kVA load for the AN and AW Tank Farms will not cause any significant change in the transformer capacity. Electric hot water heaters were not addressed in the requirements for the 200 East Tank Farm.

This conclusion is based on the existing peak demand loads (Appendix B) recorded over a two-year period with a 125 percent demand to allow for small loads [NEC 220-35 (2)], as shown in Table 2.1. The transformers are also capable of carrying additional loads based on the loading guidance in American National Standard Institute (ANSI) C57.91 for oil-filled transformers.

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Table 2.1. Electrical Load Data for DSTs

Tank Farm	Drawing Number	Transformer Size & No.	Peak Demand from Utilities assume 0.8 PF	NEC 220-35 (2) 125% demand	Maximum new load capacity on transformer	Maximum Projected WFD Loads	Projected remaining power capacity	Major Existing Loads	HNF-SD-WM-SP-012 Table 3.6-2
AN	H-14-030001	1000 kVA (C5712P)	152.5 kVA	190.6 kVA	809 kVA	663 kVA (2-300HP & 1-60HP= 663 kVA)	146 kVA		2-103, 2-104, 2-105 (W-211), 1-101 (W-521)
(W-211)	H-14-102493								
AP	H-14-030003	1000 kVA (C5859P)	208.8 kVA	261 kVA	739 kVA	663 kVA	76kVA		1-102, 1-104, 1-105 (W-211)
(W-211)	H-14-102210								
AW	H-14-030002	500 kVA (5662P)	104 kVA	130 kVA	370 kVA	663 kVA +130 kVA (Existing)+ 100kVA diluent load	0		2-101, 2-103, 2-104 (W-521)
		1000 kVA (New)					107 kVA		
AZ	H-14-030007	1000 kVA (C6653P)	40.25 kVA	50.3 kVA	950 kVA	663 kVA + 100 kVA diluent load + 70 kVA vent	117 kVA		2-101 (W151), 2-102 (W-211)
(W-151/W-211)									
(W-030)	H-14-030007	300 kVA (C6650P)	184.7 kVA	231 kVA	69 kVA		69 kVA		
AY	H-14-030006 H-14-030008	1000 kVA (C384P) AY load approx. 250 kVA	319.9 kVA	400 kVA	600 kVA	Retrival loads (250HP pump & 40HP pump= 294 kVA) + 30 vent	276 kVA		
Fed from A Farm (1000 kVA transformer)									

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Table 2.1 (Continued)									
Tank Farm	Drawing Number	Transformer Size & No.	Peak Demand from Utilities assume 0.8 PF	NEC 220-35 (2) 125% demand	Maximum new load capacity on transformer	Maximum Projected WFD Loads	Projected remaining power capacity	Major Existing Loads	HNF-SD-WM-SP-012 Table 3.6-2
AY (Fed from W-320 Transformer)	H-2-818693 H-2-99389	Pole mtd transformers 150 kVA C6351P, C6352P, C6353P)	130 kVA	162.5 kVA	0		0	250HP pump & 40HP pump (294 kVA)	
New		1000 kVA (New)				663 kVA + relocate Loads from MCC-AY-1 (250 kVA)	87 kVA		4(150 HP)-101 (W-521), 4(150 HP)-102 (W-211)
SY	H-2-46424 H-14-030031	(West) 500 kVA (C6647P)	573.6 kVA	717 kVA			0	500 kW water heater	Replace existing Transformer
		(West) 1500 kVA (New)		717 kVA	783 kVA	[SST retrieval (2) 250 HP and (2) 40 HP pumps] = 587 kVA	196 kVA	500 kW water heater	
	H-2-46424 H-14-030031 H-14-100701	(East) 500 kVA (C6648P)	717.6 kVA	897 kVA			0	100 HP transfer pump 500 kW water heater	Replace existing Transformer

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Table 2.1 (Continued)									
Tank Farm	Drawing Number	Transformer Size & No.	Peak Demand from Utilities assume 0.8 PF	NEC 220-35 (2) 125% demand	Maximum new load capacity on transformer	Maximum Projected WFD Loads	Projected remaining power capacity	Major Existing Loads	HNF-SD-WM-SP-012 Table 3.6-2
		(East) 1500 kVA (New)		897 kVA	603 kVA	663 kVA	(-60 kVA)	100 HP transfer pump 500 kW water heater	2-101, 2-103 (W-521), 2-102 (W-211)
13.8 kV Line C8-L6 (200E)	H-13-000074, H-2-2126	N/A	4806 kW @ .95% = 5059 kVA	6323 kVA	N/A	3560 kVA, 2234 kVA (Without AP & AW Loads)	Based on 7000 kVA capacity, (-1619 kVA, (-283 kVA)		
13.8 kV Line C8-L8 (200E)	H-13-000074, H-2-2126	N/A	3173 kW @ .95% = 3340 kVA	4176 kVA	N/A	1326 kVA (AP & AW Loads)	Based on 7000 kVA capacity, (598 kVA)		
13.8 kV Line C8-L3 (200W)	H-13-000079, H-2-2126	N/A	4380 kW @ .95% = 4611 kVA	5763 kVA	N/A	1370 kVA (one SY Transformer)	Based on 7000 kVA capacity, (67 kVA)		
13.8 kV Line C8-L4 (200W)	H-13-000079, H-2-2126	N/A	3299 kW @ .95% = 3473 kVA	4341 kVA	N/A	2930 kVA (Both SY Transformers), 1560 kVA (one SY Transformer)	Based on 7000 kVA capacity, (-271 kVA), (1099 kVA)		

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The existing transformers for AY, AW, and SY Tank Farms do not have sufficient capacity for the added mixer pump/transfer pump and caustic and diluent loads. A new 1000 kVA transformer should be installed to replace the existing 500 kVA transformer at the AW Tank Farm. A new 1000 kVA transformer will also be needed for the AY Tank Farm. The existing AY Tank Farm loads on MCC-AY-1 should be transferred to the new 1000 kVA transformer. The existing loads on the pole-mounted transformers for the 250-hp. booster pump and the 40-hp. floating pump installed by Project W-320, "Tank 241-C-106 Sluicing" would remain on the pole-mounted transformers.

The two existing 500 kVA transformers for the SY Tank Farm are already too small for the existing, and both transformers should be increased to 1,500 kVA to handle the heater loads and the new mixer pump and transfer pump loads. The transformers would also provide power to support the future SST retrieval of waste from the S and SX Tank Farms. The power for the SST retrieval would require the addition of a 40-hp. floating pump and a 250-hp. booster pump load in tanks SY-101 and SY-103.

The capacity of the existing 13.8 kV line C8-L6 (7 mVA) which feeds the 200 East Tank Farms will be overloaded if the maximum number of ten mixer pumps and five transfer pumps are running at the same time. Tank Farms AW and AP transformer loads should be moved to the 13.8 kV line C8-L8 which was used to feed PUREX to reduce the load on the C8-L6 line. Line C8-L8 exists just west of the AW Tank Farm, and with the installation of sectional switches and the addition of a small section of pole line, the AW and AP transformers could be changed over to the 13.8 kV line C8-L8.

- **Assessment Item #3 - Assess the electrical power required to support the retrieval of waste from a SST.**

The assumption for SST retrievals is that the maximum number of simultaneous retrievals will be one for the Southeast Quadrant (A, AX, and C Tank Farms), and three for the Southwest Quadrant (S, SX, and U), Northwest Quadrant (T, TX, and TY), and Northeast Quadrant (B, BX, and BY). The maximum number of simultaneous retrievals per tank farm is one tank, with the exception of TY Tank Farm that will switch to two simultaneous retrievals after the TX Tank Farm has been retrieved (LMHC 1999).

Project W-320 for tank C-106 was used as a guide, and it was assumed that a 250-hp. slurry pump, 40-hp. floating pump, and 30 kW HVAC loads would be required for retrieval in each SST farm. A new pad-mounted 225-kVA transformer should be installed at each SST farm except for the A and AX Tank Farms where the power could come from the existing A Tank Farm 1,000 kVA transformer. The recirculation requirements for tank AY-102 already exist and are included in Assessment Item # 1. The recirculation pumping for tanks SY-101 and SY-103 was included in the requirements for the SY Tank Farm in Assessment Item # 2.

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The recirculation pumping, a transfer pump, and a floating pump would come from three new Waste Retrieval Facilities (WRF) for transfers back to the SST farms for the B, BX, BY Tank Farms, T, TX, TY Tank Farms and U Tank Farm. The pumping of waste from the WRFs to the receiving tanks SY-102 and AY-102, and in the AN Tank Farm would be included in the WRF electrical power loads. Electrical power was not included in this study for the WRFs, as it will be installed by a future project.

The existing transformer loads that now power the SST farms storage and saltwell pumping electrical loads should remain as installed until the SST farms have been fully retrieved.

Table 2.2 provides the summary data associated with each SST farm except for retrieval loads. The data was compiled in *Letter Report Assessment of the SST Safe Storage Electrical Power Requirements* (ARES 99RL0225, 1999).

Table 2.2. Single-Shell Tank Farms Power Requirements

Tank Farm	Transformer size	Trade Study			Updated Information	
		Storage	Saltwell Pumping	Total without characterization	1995 Metered Load	1999 Load Estimate
241-A	1000 kva	633.7 kva	91.7 kva	725.4 kva	279.4 kva	174.7 kva
241-AX	Fed from A	125.9 kva	91.7 kva	217.6 kva	Unavailable	110 kva
241-B	112.5 kva	70.7 kva	7.2 kva	77.9 kva	Unavailable	84.1 kva
241-BX	30 kva & 75 kva	260.8 kva	95.5 kva	356.3 kva	Unavailable	49.8 kva
241-BY	1000 kva	413.1 kva	87.6 kva	500.7 kva	Unavailable	497.4 kva
241-C	450 kva	128.5 kva	13.7 kva	142.2 kva	141.8 kva	341 kva
241-S	300 kva	88 kva	85.1 kva	173.1 kva	Unavailable	235 kva
241-SX	300 kva & 75 kva	248.3 kva	89.6 kva	337.9 kva	Unavailable	222.5 kva
241-T	100 kva	53.4 kva	7.1 kva	60.5 kva	Unavailable	60.5 kva
241-TX	500 kva	252.4 kva	165.3 kva	417.7 kva	Unavailable	32.5 kva
241-TY	150 kva	138.3 kva	27.1 kva	165.4 kva	13.8 kva	79 kva
241-U	300 kva	172.5 kva	13.6 kva	186.1 kva	Unavailable	193 kva

- **Assessment Item #4 - Assess the capability of the electrical system to satisfy the electrical power requirements for continued safe storage of waste in both the DSTs and SSTs in the 200 East Area concurrent with DST waste retrieval per activity 2 and retrieval from one SST from A, AX, or C Tank Farms.**

The existing transformer for the AN Tank Farm has the capacity to handle the additional electrical load of two 300-hp. mixer pumps and one 60-hp. transfer pump. The present Project W-211 design for the AN-105 mixer pumps shows the mixer pumps fed from the AZ transformer. Document HNF-SD-WM-WP-012, Revision 1, *Tank Waste Remediation System Operation and Utilization Plan* (LMHC 1999) also provides for a new feed from the WRF facility for the B, BX, and BY SST Farm retrieval. No new loads were projected for transfer from the

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WRF to the AN Tank Farm as the transfer pump would be located in the WRF facility.

The existing transformer for the AP Tank Farm has sufficient capacity to handle the additional electrical load of two 300-hp. mixer pumps and one 60-hp. transfer pump. It was assumed that the transfer pumps for the low activity waste feed to the vitrification plant from AP-104 or AP-108 were included as one of the 60-hp. transfer pumps per farm. The 13.8 kV feeder line should be changed to line C8-L8.

The existing 500 kVA transformer for the AW Tank Farm does not have sufficient capacity to handle the additional electrical load of two 300-hp. mixer pumps, one 60-hp. transfer pump and the caustic and diluent system. A new transformer (1000 kVA) should be installed for the additional loads plus the existing loads on Motor Control Center (MCC) (EDS-MCC-001) fed from the existing 500 kVA transformer, putting all the AW Tank Farm loads on one transformer. The 13.8 kV feeder line should be changed to line C8-L8 to reduce the load on the line C8-L6.

The existing transformer for the AZ Tank Farm has sufficient capacity to handle the additional electrical load of two 300-hp. mixer pumps and one 60-hp. transfer pump. The AZ transformer does not have the capacity to handle the additional two 300-hp. mixer pumps and one 60-hp. transfer pump for the AN Tank Farm as presently designed by Project W-211. The existing 1000 kVA AZ Tank Farm transformer will need to be increased to a 2000 kVA transformer if the AN Tank Farm mixer pumps and transfer pump remain on the AZ Tank Farm transformer. The Project W-030, "Tank Farm Ventilation Upgrade," 300 kVA transformer for the AZ/AY Tank Farms should remain as installed for the ventilation system. It was assumed that the transfer pumps for the high-level waste feed to the vitrification plant from tanks AZ-101 or AZ-102 were included as one of the 60-hp. transfer pumps per farm.

The existing transformer which is shared by the A, AX, and AY Tank Farms does not have sufficient capacity to handle the additional electrical load of two 300-hp. mixer pumps and one 60-hp. transfer pump in the AY Tank Farm and the projected loads for the SST retrieval from the A and AX Tank Farms (one 250-hp. booster pump and one 40-hp. float pump). A new transformer (1,000 kVA) should be installed for the new mixer pump and transfer pump loads. The existing loads for SST retrieval (one 250-hp. booster pump and one 40-hp. float pump) should remain on the three pole-mounted transformers installed by Project W-320. The AY Tank Farm loads on MCC-AY-1 (EDS-MCC-601) should be relocated from the A Tank Farm transformer. This arrangement will consolidate the AY Tank Farm loads on the new AY Tank Farm transformer, except for the Project W-030 HVAC loads which are shared with the AZ Tank Farm.

- **Assessment Item #5 - Assess the capability of the electrical system to satisfy the electrical power requirements for continued safe storage of waste in both**

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the DSTs and SSTs in the 200 West Area concurrent with DST waste retrieval per activity 2 and retrieval from one SST from S, SX, or U Tank Farm.

The existing transformers for the SY Tank Farm presently do not have sufficient capacity to handle the existing loads of two 500 kW heaters and a 100-hp. transfer pump for waste transfer from tanks SY-101 to SY-102. A bank of temporary pole-mounted transformers is being installed to refeed one of the 500 kW heaters. The additional electrical load to be added consists of two 300-hp. mixer pumps, one 60-hp. transfer pump, and the projected loads for the SST retrieval from the S and SX Tank Farms into the SY-101 and SY-103 tanks (two 250-hp. booster pumps and two 40-hp. float pumps). The two existing 500 kVA pad-mounted transformers for the 252-S switchgear SWG-E-001 should be replaced with 1,500 kVA transformers. No new loads were projected for transfer from the U Tank Farm WRF to tank SY-102, as the transfer pump would be located in the WRF facility.

3.0 CONCLUSIONS

The existing transformers are adequate to supply the loads in each DST farm for safe storage with the potential exception of the SY Tank Farm. The existing loads and the future loads for mixer pumps, transfer pumps, booster pumps and floating transfer pumps can be fed from the existing transformers in the AN, AP and AZ Tank Farms based on current metering data. Detailed load calculations for these farms are necessary to verify this conclusion. New transformers will be required for the AW, AY, and SY Tank Farms to service the new and existing loads. New transformers for the SY Tank Farm should be a priority item as the existing transformers may not be capable of accepting new loads or changes in load cycle.

The existing switchgear capacity and feeder cable sizes from the transformers to the switchgear will have to be assessed and possibly upgraded for the installation of the new mixer pump motor loads. This assessment/upgrade is the responsibility of projects installing new loads. Any major changes to the criteria will require additional study to assess the impact on the transformer loading.

The backup power supplies (diesel generators or Uninterruptible Power Source) were not looked into during this review. The one-line drawings show a diesel generator installed for the AY/AZ ventilation system and a trailer mounted diesel generator installed for the SY Tank Farm "Train A" ventilation system.

In order to evaluate the backup power requirements, the Double-Shell Waste Tank Safety Equipment List will need to be assessed against the present and future requirements to determine the impact.

To provide a limited source of backup power to the 200 East DST Farm transformers, a cross-tie between the 13.8 kV power lines C8-L6 or C8-L8 and the C8-L5 line and the installation of the 13.8 kV C8-L3 line to one of the SY Tank Farm substation transformers should be considered.

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4.0 RECOMMENDATIONS

The following recommendations are offered:

- Install a new transformer for the added loads and the existing loads on MCC-AY-1 (EDS-MCC-001) in the AY Tank Farm, replace the AW Tank Farm transformer and both SY Tank Farm transformers with larger transformers. The transformers for the SY Tank Farm need to be changed immediately to reduce the current overloading. Reuse of the 500 kVA transformers removed from the SY Tank Farm for the AW Tank Farm should be considered.
- Change the Project W-211 design for the AN Tank Farm power feed for the mixer pumps from the AZ transformer to the AN transformer to consolidate the AN Tank Farm loads to only one transformer. If the AN Tank Farm two 300-hp. mixer pumps and the 60-hp. transfer pump remain on the AZ Tank Farm transformer, the transformer will need to be changed to 2000 kVA.
- Change the 13.8 kV feeder for the AW and AP Tank Farms transformers from the C8-L6 line to the C8-L8 line to improve on the voltage regulation due to the starting of the 300-hp. mixer pumps and to reduce the load on the C8-L6 line. The load capacity of the C8-L6 line needs to be coordinated with the Utility Group and some reconductoring maybe required due to the added DST loads.
- Install a new 13.8 kV line C8-L3 to one of the SY Tank Farm transformers to improve reliability and provide a means of alternate backup power.
- Install 13.8 kV sectionalizing switches to allow the 200 East Tank Farms to be readily switched to an alternate 13.8 kV source line C8-L5 for temporary limited backup power during loss of 13.8 kV power from either the C8-L6 or C8-L8 lines.
- Perform load flow and short circuit calculations for each Tank Farm to verify that the cable and equipment ratings will support the existing loads and the projected new loads.
- Monitor the loads on the existing 150 kVA transformers installed by Project W-320 and install larger transformers if the 250 HP pump is to be operated under higher load.

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5.0 UNCERTAINTIES

The assumptions utilized in this review were not in complete agreement with HNF-SD-WM-WP-012, Revision 1, *Tank Waste Remediation System Operation and Utilization Plan* (LMHC 1999) (Case 3). The assumptions were based on the Statement of Work criteria.

The remaining useful life of the existing facilities was not taken into account, although a cursory review identified no major issues. No reliability requirements were considered in this review. It is probable that a high degree of reliability will be obtained through regular maintenance. Each upgrade should, however, identify a reliability goal and implement appropriate design criteria to obtain this goal.

WRFs are planned in support of SST retrieval, but power requirements for them remain uncertain and are not considered in this review except as stated herein.

6.0 REFERENCES

ANSI C57.91, Institute of Electrical and Electronics Engineering (*IEEE*) *Guide for Loading Mineral-Oil-Immersed Transformers*.

ARES 1999, Letter, Robert L. Fritz (ARES) to Charles E. Grenard (COGEMA), *COGEMA Task Order P-99-032-009 - Transmittal of Letter Report - ARES Task No. 9904910*, dated February 22, 1999, ARES Corporation, Richland, Washington (see Appendix C for scope of work).

H-2-2126, Sht. 5 and 7, *200 East Area Electrical Utilities Distribution Map*.

H-2-46424, Sht. 1, *Electrical One Line Diagram*. (SY Tank Farm)

H-2-99389, Sht. 5 and 6, *Electrical AY Farm One-Line Diagram*.

H-2-818693, Sht. 1, *Electrical AY Farm One Line Diagram*.

H-13-000074, Sht. 5, 6, and 7, *200 West Area Electrical Utilities Distribution Map*.

H-13-000079, Sht. 4 and 6, *200 East Area Electrical Utilities Distribution Map*.

H-14-030001, Sht. 1-4, *Electrical (EDS) One Line Diagram*. (AN Tank Farm)

H-14-030002, Sht. 1-3, *Electrical (EDS) One Line Diagram*. (AW Tank Farm)

H-14-030003, Sht. 1-4, *Electrical (EDS) One Line Diagram*. (AP Tank Farm)

H-14-030006, Sht. 1-3, *Electrical (EDS) One Line Diagram*. (AY Tank Farm)

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H-14-030008, Shts. 1-5, *Electrical (EDS) One Line Diagram*. (A Tank Farm)

H-14-030031, Sht. 1-5, *Electrical (EDS) One Line Diagram*. (SY Tank Farm)

H-14-100701, Sht. 1, *Electrical Tank 241-SY-102 One Line Diagram*. (Project W-211)

H-14-102210, Shts. 1-2, *Electrical Tank 241-AP Tank Farm One Line Diagram*. (Project W-211)

H-14-102493, Shts. 1-2, *Electrical Tank 241-AN-105 One Line Diagram*. (Project W-211)

LMHC 1999, *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Lockheed Martin Hanford Corporation, Richland, Washington.

NEC 1999, (National Electrical Code) NFPA-70-1999.

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7.0 PERSONNEL CONTACTED

- **Lockheed Martin Hanford Corp.**

M. Al-Wazani	Electrical Cognizant Engineer
J. Kriskovich	HVAC Cognizant Engineer
J. Roberts	200W Electrical Cognizant Engineer
C. Scaief	Instrument Cognizant Engineer
J. Wells	200E Electrical Cognizant Engineer

- **COGEMA**

R. Spang	Project W-314 HVAC Engineer
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- **Fluor Daniel Hanford Northwest, Inc.**

R. Amante	Project W-211 Electrical Engineer
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- **DynCorp**

J. Uecker	Electrical Engineer
M. Hache	Electrical Utility Cognizant Engineer

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Appendix A
East Area Transformer Locations

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Appendix B
Electricity Consumption and Cost Reports

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REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-A, 241-AX, 241-AY			
Service (Line,Breaker)	C8-L5			Automatic Data
Transformer Number	C0384F (1,000 KVA)			
New Meter Number	Meter Difference	Old Meter Number	NA	
Data Logger Number	084CH72 - 059CH68			

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	99.2	119.7	89,057	166.2	76.6	0.72	1,138.15	400.38	1,538.52	
08/97	20.4	124.3	92,479	156.5	97.5	0.79	1,683.12	377.01	2,060.13	Low % Capture.
09/97	48.3	137.9	99,288	158.2	119.5	0.87	2,165.47	381.10	2,546.58	Low % Capture.
10/97	100.0	143.8	106,987	171.7	115.6	0.84	2,333.39	413.63	2,747.02	
11/97	99.4	159.3	114,696	200.1	107.9	0.80	2,501.52	482.04	2,983.56	
12/97	100.0	189.5	140,988	255.9	131.8	0.74	3,074.95	616.46	3,691.41	
01/98	98.8	205.1	152,594	252.2	138.2	0.81	3,383.02	607.55	3,990.57	
02/98	99.1	177.5	119,280	234.2	127.8	0.76	2,644.44	564.19	3,208.63	
03/98	98.3	138.2	102,821	221.4	53.6	0.62	2,279.54	533.35	2,812.89	
04/98	97.9	69.6	50,112	136.3	29.8	0.51	993.72	328.35	1,322.07	
05/98	92.5	69.9	52,006	125.0	42.0	0.56	540.86	301.13	841.98	
06/98	92.4	57.7	41,544	125.7	28.1	0.46	432.06	302.81	734.87	
07/98	99.6	52.0	38,688	76.2	23.8	0.68	494.43	183.57	678.00	
08/98	99.1	70.6	52,526	171.3	29.7	0.41	955.98	412.66	1,368.64	
09/98	98.1	63.3	45,576	87.8	41.1	0.72	994.01	211.51	1,205.52	
10/98	98.7	73.7	54,833	109.7	41.5	0.67	1,195.90	264.27	1,460.17	
11/98	92.4	82.1	59,112	125.5	39.4	0.65	1,289.23	302.33	1,591.56	
12/98	97.4	121.7	90,545	179.8	52.2	0.68	1,974.78	433.14	2,407.92	
01/99	99.7	114.2	84,965	151.8	79.4	0.75	1,883.67	365.69	2,249.36	
02/99	99.6	103.5	69,552	137.6	63.5	0.75	1,541.97	331.48	1,873.45	
03/99	98.3	95.6	71,126	135.5	57.4	0.71	1,576.87	326.42	1,903.29	
04/99	99.4	88.1	63,432	123.9	57.5	0.71	1,257.86	298.48	1,556.33	
05/99	99.6	73.8	54,907	129.4	45.8	0.57	571.03	311.72	882.76	
06/99	99.4	62.0	44,640	91.3	41.4	0.68	464.26	219.94	684.20	
Average	92.8	108.0	78,823	155.1	68.4	0.70	1,557.09	373.72	1,930.81	
Maximum	100.0	205.1	152,594	255.9	138.2	0.87	3,383.02	616.46	3,990.57	

241-A, AX, AY MONTHLY DEMAND PROFILE

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ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-AY-051 Sluice Pumps						
Service (Line,Breaker)	C8-L6, F8X694						Manual Readings
Transformer Number	C6351P, C6352P, C6353P (150 KVA)						
New Meter Number	95-875-449	Old Meter Number	NA				
New Multiplier	5	Old Multiplier	NA				
New Number of Dials	5	Old Number of Dials	NA				

Date	Energy Reading	Difference	Monthly	Average (KW)	Demand Reading	Demand (KW)	Load Factor	Energy	Demand	Total	Comments
			Consump. (KWH)					Cost (\$)	Cost (\$)	Cost (\$)	
07/09/97	7303										
08/14/97	8099	796	3,980	5	1.3	7	0.71	50.86	15.66	66.52	Demand Not Reset.
09/05/97	8567	468	2,340	4	1.1	6	0.81	42.59	13.25	55.84	
10/03/97	9153	586	2,930	4	1.3	7	0.67	63.90	15.66	79.56	
11/12/97	9981	828	4,140	4	1.2	6	0.72	90.29	14.45	104.75	
12/02/97	10380	399	1,995	4	1.1	6	0.76	43.51	13.25	56.76	
01/07/98	10867	487	2,435	3	1.4	7	0.40	53.11	16.86	69.97	
01/30/98	11190	323	1,615	3	1.0	5	0.59	35.80	12.05	47.85	
03/09/98	11516	326	1,630	2	0.9	5	0.40	36.14	10.84	46.98	
04/08/98	11676	160	800	1	0.8	4	0.28	17.74	9.64	27.37	
05/05/98	11767	91	455	1	1.1	6	0.13	9.02	13.25	22.27	
06/01/98	11847	80	400	1	0.9	5	0.14	4.16	10.84	15.00	
07/01/98	11963	116	580	1	0.8	4	0.20	6.03	9.64	15.67	
08/14/98	12213	250	1,250	1	1.0	5	0.24	15.98	12.05	28.02	
09/08/98	12345	132	660	1	0.7	4	0.31	12.01	8.43	20.44	
10/05/98	12435	90	450	1	0.7	4	0.20	9.81	8.43	18.25	Demand Not Reset.
11/10/98	12632	197	985	1	1.4	7	0.16	21.48	16.86	38.35	
12/04/98	12875	243	1,215	2	11.8	59	0.04	26.50	142.13	168.63	
01/08/99	13474	599	2,995	4	3.1	16	0.23	65.32	37.34	102.66	
02/09/99	13999	525	2,625	3	1.1	6	0.62	58.20	13.25	71.45	
03/01/99	14321	322	1,610	3	0.8	4	0.84	35.69	9.64	45.33	
04/07/99	14957	636	3,180	4	19.9	100	0.04	70.50	239.70	310.20	
05/03/99	15308	351	1,755	3	20.7	104	0.03	34.80	249.33	284.13	
06/01/99	15490	182	910	1	18.0	90	0.01	9.46	216.81	226.27	
07/06/99	15794	304	1,520	2	20.8	104	0.02	15.81	250.54	266.34	
Average			1,769	2		24	0.10	34.53	56.66	91.19	
Maximum			4,140	5		104	0.84	90.29	250.54	310.20	

METER 95-875-449

MONTHLY DEMAND PROFILE

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ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-C-106 Sluice Pumps						
Service (Line,Breaker)	C8-L6, F8X700						Manual Readings
Transformer Number	C6646P (225 KVA)						
New Meter Number	92-592-538	Old Meter Number	NA				
New Multiplier	40	Old Multiplier	NA				
New Number of Dials	4	Old Number of Dials	NA				

Date	Energy Reading	Difference	Monthly Consump. (KWH)	Average (KW)	Demand Reading	Demand (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/11/97	2953										
08/15/97	3013	60	2,400	3	0.31	12	0.23	30.67	29.87	60.54	
09/05/97	3113	100	4,000	8	0.29	12	0.68	72.80	27.94	100.74	
10/03/97	3344	231	9,240	14	0.84	34	0.41	201.52	80.94	282.47	
11/12/97	3669	325	13,000	14	0.68	27	0.50	283.53	65.52	349.05	
12/03/97	3889	220	8,800	17	0.65	26	0.67	191.93	62.63	254.56	
01/07/98	4320	431	17,240	21	0.78	31	0.66	376.00	75.16	451.17	
02/02/98	4608	288	11,520	18	0.80	32	0.58	255.40	77.09	332.49	
03/09/98	5156	548	21,920	26	1.03	41	0.63	485.97	99.25	585.22	
04/08/98	5636	480	19,200	27	1.19	48	0.56	425.66	114.67	540.33	
05/05/98	5796	160	6,400	10	0.84	34	0.29	126.91	80.94	207.85	
06/02/98	5903	107	4,280	6	0.29	12	0.55	44.51	27.94	72.46	
07/01/98	6101	198	7,920	11	1.37	55	0.21	82.37	132.01	214.38	
08/14/98	7099	998	39,920	38	1.50	60	0.63	510.18	144.54	654.72	
09/08/98	7620	521	20,840	35	1.45	58	0.60	379.29	139.72	519.01	
10/06/98	8139	519	20,760	31	1.33	53	0.58	452.78	128.16	580.93	
11/10/98	9306	1167	46,680	56	1.89	76	0.74	1,018.09	182.12	1,200.21	
12/07/98	9980	674	26,960	42	2.91	116	0.36	588.00	280.41	868.41	
01/08/99	729	749	29,960	39	2.37	95	0.41	653.43	228.37	881.80	
02/09/99	1352	623	24,920	32	1.20	48	0.68	552.48	115.63	668.11	
03/01/99	1786	434	17,360	36	1.65	66	0.55	384.87	158.99	543.87	
04/08/99	2687	901	36,040	40	3.11	124	0.32	799.01	299.68	1,098.69	
05/03/99	3395	708	28,320	47	2.94	118	0.40	561.59	283.30	844.88	
06/01/99	4012	617	24,680	35	3.13	125	0.28	256.67	301.61	558.28	
07/06/99	4448	436	17,440	21	3.11	124	0.17	181.38	299.68	481.06	
Average			19,158	26		59	0.44	371.46	143.17	514.63	
Maximum			46,680	56		125	0.74	1,018.09	301.61	1,200.21	

METER 92-592-538

MONTHLY DEMAND PROFILE

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ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-AZ-156		
Service (Line,Breaker)	C8-L6, F8X723		Automatic Data
Transformer Number	C6653P (1,000 KVA)		
New Meter Number	95-071-095	Old Meter Number	NA
Data Logger Number	110		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	99.5	9.1	6,785	18.5	3.4	0.49	86.72	44.52	131.23	
08/97	99.7	8.4	6,250	21.8	4.6	0.38	113.74	52.61	166.36	
09/97	99.2	7.4	5,357	12.7	4.6	0.58	116.83	30.64	147.47	
10/97	100.0	8.4	6,250	14.9	3.4	0.56	136.30	35.85	172.15	
11/97	99.9	15.1	10,886	32.2	3.4	0.47	237.43	77.47	314.91	
12/97	99.9	17.8	13,213	32.2	8.2	0.55	288.19	77.47	365.66	
01/98	100.0	17.3	12,856	27.6	5.8	0.63	285.02	66.49	351.51	
02/98	99.0	13.4	9,032	23.0	4.6	0.58	200.23	55.50	255.74	
03/98	99.7	11.3	8,392	19.7	3.4	0.57	186.06	47.41	233.47	
04/98	99.7	8.6	6,221	17.3	3.4	0.50	123.36	41.63	164.99	
05/98	99.9	6.7	5,000	13.9	3.4	0.48	52.00	33.53	85.53	
06/98	99.9	6.7	4,838	12.7	3.4	0.53	50.32	30.64	80.96	
07/98	99.9	7.2	5,357	12.7	2.4	0.57	68.46	30.64	99.10	
08/98	99.9	8.6	6,428	13.9	3.4	0.62	116.99	33.53	150.53	
09/98	99.7	8.4	6,048	14.9	3.4	0.56	131.91	35.85	167.75	
10/98	99.9	7.7	5,729	13.8	3.5	0.56	124.95	33.24	158.19	
11/98	99.9	9.4	6,768	16.1	3.5	0.58	147.61	38.78	186.39	
12/98	99.9	12.8	9,523	23.0	4.6	0.56	207.70	55.41	263.11	
01/99	99.9	12.2	9,077	18.4	4.6	0.66	201.23	44.33	245.56	
02/99	92.9	14.1	9,475	26.5	4.6	0.53	210.07	63.84	273.90	
03/99	99.9	16.6	12,350	31.1	5.8	0.53	273.81	74.92	348.73	
04/99	99.0	13.9	10,008	28.8	5.8	0.48	198.46	69.38	267.84	
05/99	99.1	12.7	9,449	27.6	5.8	0.46	98.27	66.49	164.76	
06/99	99.9	12.3	8,856	23.0	5.8	0.53	92.10	55.41	147.51	
Average	99.4	11.1	8,090	20.7	4.3	0.54	156.16	49.82	205.97	
Maximum	100.0	17.8	13,213	32.2	8.2	0.66	288.19	77.47	365.66	

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ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-AZ-271, 241-AZ-701, 241-AZ-702 AZ/AY Tank Farm Ventilation System		
Service (Line,Breaker)	C8-L6, F8X709	Automatic Data	
Transformer Number	C6650P (300 KVA)		
New Meter Number	95-101-149	Old Meter Number	NA
Data Logger Number	116		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
<hr/>										
07/97	99.1	24.8	18,451	110.4	17.3	0.22	300.57	457.17	757.74	
08/97	19.1	28.3	21,055	104.6	18.7	0.27	342.99	433.15	776.14	Low % Capture.
09/97	72.6	29.7	21,384	115.2	17.3	0.26	474.08	477.04	951.13	Low % Capture.
10/97	1.6			104.6				433.15		Low % Capture.
11/97	89.3	40.4	29,088	110.4	23.0	0.37	644.88	457.17	1,102.05	
12/97	100.0	36.2	26,933	103.7	27.4	0.35	597.10	429.42	1,026.52	
01/98	99.9	42.4	31,546	84.5	24.5	0.50	699.37	349.91	1,049.28	
02/98	99.9	32.2	21,638	47.0	21.1	0.69	479.72	194.63	674.35	
03/98	99.7	41.6	30,950	100.8	22.1	0.41	686.17	417.41	1,103.58	
04/98	93.1	58.3	41,976	66.2	52.3	0.88	683.79	274.13	957.92	
05/98	99.1	59.9	44,566	69.1	25.0	0.87	725.97	286.14	1,012.12	
06/98	99.9	82.9	59,688	106.1	58.6	0.78	972.32	439.36	1,411.68	
07/98	99.9	99.5	74,028	127.7	43.7	0.78	1,205.92	528.81	1,734.72	
08/98	99.3	121.7	90,545	146.9	49.4	0.83	1,474.97	608.31	2,083.29	
09/98	99.6	120.7	86,904	147.8	60.5	0.82	1,926.66	612.04	2,538.70	
10/98	99.1	110.3	82,063	120.0	97.0	0.92	1,819.34	496.92	2,316.26	
11/98	99.9	104.9	75,528	113.3	93.6	0.93	1,674.46	469.18	2,143.63	
12/98	99.9	108.1	80,426	129.6	93.1	0.83	1,783.05	536.67	2,319.73	
01/99	99.9	102.5	76,260	110.4	38.9	0.93	1,690.68	457.17	2,147.85	
02/99	99.7	112.1	75,331	123.8	94.6	0.91	1,670.09	512.66	2,182.75	
03/99	98.9	116.4	86,602	122.9	109.9	0.95	1,919.96	508.93	2,428.89	
04/99	99.6	114.3	82,296	120.5	36.0	0.95	1,340.60	498.99	1,839.59	
05/99	99.9	113.4	84,370	131.0	106.6	0.87	1,374.38	542.47	1,916.85	
06/99	99.9	124.2	89,424	141.6	103.2	0.88	1,456.72	586.37	2,043.08	
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Average	90.4	79.3	57,872	110.8	53.6	0.72	1,127.99	458.63	1,587.73	
Maximum	100.0	124.2	90,545	147.8	109.9	0.95	1,926.66	612.04	2,538.70	

METER 95-101-149

MONTHLY DEMAND PROFILE

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ELECTRICITY CONSUMPTION AND COST REPORT

Building 241-AW Tank Farm
Service (Line,Breaker) C8-L6
Transformer Number C5662P (500 KVA)
New Meter Number 30-928-723
Data Logger Number 059

Old Meter Number NA

Automatic Data

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	99.3	59.7	44,417	73.6	41.6	0.81	567.65	177.30	744.95	
08/97	99.9	58.5	43,524	81.6	48.0	0.72	792.14	196.57	988.71	
09/97	99.9	57.7	41,544	67.2	44.8	0.86	906.07	161.88	1,067.96	
10/97	100.0	63.4	47,170	81.6	49.6	0.78	1,028.77	196.57	1,225.34	
11/97	99.7	72.7	52,344	89.6	52.8	0.81	1,141.62	215.85	1,357.47	
12/97	100.0	73.4	54,610	94.4	43.2	0.78	1,191.04	227.41	1,418.44	
01/98	99.9	70.4	52,378	97.6	43.2	0.72	1,161.21	235.12	1,396.33	
02/98	99.4	66.7	44,822	91.2	43.2	0.73	993.71	219.70	1,213.41	
03/98	98.9	58.7	43,673	86.4	41.6	0.68	968.23	208.14	1,176.36	
04/98	99.7	52.3	37,656	70.4	41.6	0.74	746.72	169.59	916.31	
05/98	93.0	49.1	36,530	70.4	40.0	0.70	379.92	169.59	549.51	
06/98	92.5	53.3	38,376	73.6	38.4	0.72	399.11	177.30	576.41	
07/98	99.9	60.1	44,714	75.2	40.0	0.80	571.45	181.16	752.61	
08/98	99.3	51.3	38,167	65.6	38.4	0.78	694.64	158.03	852.67	
09/98	98.9	52.1	37,512	67.2	27.2	0.78	818.14	161.88	980.02	
10/98	99.2	61.2	45,533	80.0	40.0	0.77	993.07	192.72	1,185.79	
11/98	93.1	66.1	47,592	84.8	43.2	0.78	1,037.98	204.28	1,242.26	
12/98	98.1	68.9	51,262	104.0	44.8	0.66	1,118.02	250.54	1,368.55	
01/99	99.9	62.0	46,128	86.4	40.0	0.72	1,022.66	208.14	1,230.80	
02/99	100.0	67.0	45,024	84.8	46.4	0.79	998.18	204.28	1,202.47	
03/99	99.1	66.8	49,699	88.0	43.2	0.76	1,101.83	211.99	1,313.82	
04/99	99.7	61.7	44,424	84.8	46.4	0.73	880.93	204.28	1,085.21	
05/99	99.7	59.5	44,268	84.8	46.4	0.70	460.39	204.28	664.67	
06/99	99.9	58.5	42,120	81.6	44.8	0.72	438.05	196.57	634.62	
Average	98.7	61.3	44,729	81.9	42.9	0.75	850.48	197.22	1,047.70	
Maximum	100.0	73.4	54,610	104.0	52.8	0.86	1,191.04	250.54	1,418.44	

METER 30-928-723

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-AN Tank Farm, 271-AN				
Service (Line,Breaker)	C8-L6			Automatic Data	
Transformer Number	C5712P (1,000 KVA)				
New Meter Number	30-935-235	Old Meter Number	NA		
Data Logger Number	067				

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	99.7	76.8	57,139	101.0	52.0	0.76	730.24	243.31	973.55	
08/97	100.0	73.8	54,907	89.0	6.0	0.83	999.31	214.40	1,213.71	
09/97	99.9	73.8	53,136	93.0	51.5	0.79	1,158.90	224.04	1,382.93	
10/97	100.0	78.5	58,404	100.5	46.5	0.78	1,273.79	242.10	1,515.90	
11/97	99.6	88.2	63,504	105.0	68.0	0.84	1,385.02	252.95	1,637.97	
12/97	99.9	91.2	67,853	108.5	56.0	0.84	1,479.87	261.38	1,741.25	
01/98	99.9	100.8	74,995	122.0	75.0	0.83	1,662.64	293.90	1,956.54	
02/98	99.6	97.6	65,587	114.0	77.5	0.86	1,454.07	274.63	1,728.69	
03/98	98.8	86.9	64,654	112.5	0.0	0.77	1,433.37	271.01	1,704.38	
04/98	98.8	80.5	57,960	102.0	60.0	0.79	1,149.35	245.72	1,395.06	
05/98	98.3	79.8	59,371	97.5	59.5	0.82	617.46	234.88	852.34	
06/98	99.9	70.2	50,544	95.5	48.5	0.74	525.66	230.06	755.72	
07/98	100.0	76.8	57,139	91.0	62.0	0.84	730.24	219.22	949.46	
08/98	98.9	69.2	51,485	80.5	51.5	0.86	937.02	193.92	1,130.95	
09/98	99.7	68.9	49,608	83.0	0.0	0.83	1,081.95	199.95	1,281.90	
10/98	99.9	81.9	60,934	99.0	69.5	0.83	1,328.96	238.49	1,567.45	
11/98	99.9	87.3	62,856	102.5	48.0	0.85	1,370.89	246.92	1,617.81	
12/98	99.7	98.8	73,507	122.0	76.5	0.81	1,603.19	293.90	1,897.09	
01/99	99.9	99.0	73,656	120.5	58.5	0.82	1,632.95	290.28	1,923.24	
02/99	98.7	98.1	65,923	116.0	73.5	0.85	1,461.52	279.44	1,740.96	
03/99	99.9	91.8	68,299	112.5	71.5	0.82	1,514.19	271.01	1,785.21	
04/99	99.7	79.5	57,240	112.5	57.0	0.71	1,135.07	271.01	1,406.08	
05/99	99.7	80.1	59,594	103.0	69.5	0.78	619.78	248.13	867.91	
06/99	99.9	78.9	56,808	96.5	66.0	0.82	590.80	232.47	823.27	
Average	99.6	83.7	61,046	103.3	54.3	0.81	1,161.51	248.88	1,410.39	
Maximum	100.0	100.8	74,995	122.0	77.5	0.86	1,662.64	293.90	1,956.54	

METER 30-935-235

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-AP Tank Farm						
Service (Line,Breaker)	C8-L6			Automatic Data			
Transformer Number	C5859P (1,000 KVA)						
New Meter Number	69-881-480	Old Meter Number	NA				
Data Logger Number	061						

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	99.7	73.2	54,461	94.5	59.5	0.77	696.01	227.65	923.66	
08/97	100.0	72.9	54,238	91.0	38.5	0.80	987.12	219.22	1,206.34	
09/97	99.7	78.3	56,376	92.0	66.5	0.85	1,229.56	221.63	1,451.19	
10/97	100.0	87.2	64,877	121.5	64.0	0.72	1,414.96	292.69	1,707.66	
11/97	99.4	101.1	72,792	126.5	30.0	0.80	1,587.59	304.74	1,892.33	
12/97	98.8	108.9	81,022	153.0	0.0	0.71	1,767.08	368.58	2,135.66	
01/98	99.7	107.8	80,203	140.0	0.0	0.77	1,778.10	337.26	2,115.36	
02/98	99.9	101.3	68,074	122.0	79.5	0.83	1,509.19	293.90	1,803.09	
03/98	99.7	94.7	70,457	118.0	74.0	0.80	1,562.03	284.26	1,846.29	
04/98	99.6	95.6	68,832	118.0	77.0	0.81	1,364.94	284.26	1,649.20	
05/98	99.6	89.0	66,216	106.5	70.0	0.84	688.65	256.56	945.20	
06/98	100.0	82.2	59,184	95.5	63.0	0.86	615.51	230.06	845.57	
07/98	99.6	78.5	58,404	93.5	60.5	0.84	746.40	225.24	971.64	
08/98	99.9	78.6	58,478	93.0	61.0	0.85	1,064.31	224.04	1,288.34	
09/98	98.9	80.2	57,744	98.0	61.0	0.82	1,259.40	236.08	1,495.48	
10/98	99.7	90.3	67,183	113.0	70.0	0.80	1,465.27	272.22	1,737.48	
11/98	100.0	98.0	70,560	119.5	79.0	0.82	1,538.91	287.88	1,826.79	
12/98	99.9	113.7	84,593	150.5	88.5	0.76	1,844.97	362.55	2,207.52	
01/99	99.9	117.9	87,718	167.0	93.5	0.71	1,944.70	402.30	2,347.00	
02/99	98.8	113.8	76,474	138.0	94.0	0.82	1,695.42	332.44	2,027.86	
03/99	93.1	126.7	94,265	156.0	93.5	0.81	2,089.85	375.80	2,465.65	
04/99	99.7	127.9	92,088	164.0	103.5	0.78	1,826.11	395.08	2,221.18	
05/99	98.5	119.4	88,834	156.0	102.0	0.77	923.87	375.80	1,299.67	
06/99	99.0	110.6	79,632	137.5	91.5	0.80	828.17	331.24	1,159.41	
Average	99.3	97.8	71,363	123.5	67.5	0.79	1,351.17	297.56	1,648.73	
Maximum	100.0	127.9	94,265	167.0	103.5	0.86	2,089.85	402.30	2,465.65	

METER 69-881-480

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-SY Tank Farm, 242-S Evaporator			
Service (Line,Breaker)	C8-L4, F8X702			Automatic Data
Transformer Number	C6647P (500 KVA)			
New Meter Number	95-031-127	Old Meter Number	NA	
Data Logger Number	060			

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
07/97	93.0	57.8	43,003	66.2	48.0	0.87	549.58	159.48	709.06	
08/97	92.9	56.7	42,185	67.7	44.2	0.84	767.76	163.09	930.85	
09/97	89.9	52.0	37,440	64.3	43.7	0.81	816.57	154.90	971.47	
10/97	75.8	59.9	44,566	141.1	43.2	0.42	971.98	339.91	1,311.89	
11/97	99.3	109.0	78,480	188.2	44.2	0.58	1,711.65	453.37	2,165.02	
12/97	100.0	143.2	106,541	445.0	48.0	0.32	2,323.65	1,072.00	3,395.66	
01/98	99.9	151.7	112,865	220.3	53.3	0.69	2,502.21	530.70	3,032.92	
02/98	99.9	79.7	53,558	458.9	39.4	0.17	1,187.39	1,105.49	2,292.88	
03/98	99.7	58.7	43,673	293.3	38.9	0.20	968.23	706.56	1,674.79	
04/98	98.1	83.8	60,336	123.4	31.2	0.68	1,196.46	297.27	1,493.73	
05/98	99.7	38.8	28,867	54.2	31.2	0.72	300.22	130.57	430.79	
06/98	100.0	43.0	30,960	165.1	32.6	0.26	321.98	397.73	719.71	
07/98	99.9	49.0	36,456	175.7	37.0	0.28	465.91	423.26	889.17	
08/98	99.7	48.6	36,158	252.5	37.4	0.19	658.08	608.27	1,266.36	
09/98	99.9	49.2	35,424	185.3	40.3	0.27	772.60	446.39	1,218.99	
10/98	99.9	49.0	36,456	174.7	29.8	0.28	795.11	420.85	1,215.96	
11/98	99.9	55.6	40,032	230.4	36.0	0.24	873.10	555.03	1,428.13	
12/98	99.9	89.0	66,216	269.3	45.1	0.33	1,444.17	648.74	2,092.91	
01/99	99.9	103.4	76,930	314.4	44.6	0.33	1,705.53	757.39	2,462.92	
02/99	99.9	91.6	61,555	278.9	47.0	0.33	1,364.68	671.87	2,036.55	
03/99	99.9	78.5	58,404	389.8	43.2	0.20	1,294.82	939.03	2,233.84	
04/99	92.6	68.0	48,960	309.1	46.6	0.22	970.88	744.62	1,715.50	
05/99	98.5	57.1	42,482	112.8	45.6	0.51	441.82	271.74	713.55	
06/99	98.8	55.6	40,032	241.4	44.6	0.23	416.33	581.53	997.87	
Average	97.4	72.0	52,566	217.6	41.5	0.33	1,034.20	524.16	1,558.35	
Maximum	100.0	151.7	112,865	458.9	53.3	0.87	2,502.21	1,105.49	3,395.66	

METER 95-031-127

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	241-SY Tank Farm, 242-S Evaporator				
Service (Line,Breaker)	C8-L4, F8X703			Automatic Data	
Transformer Number	C6648P (500 KVA)				
New Meter Number	95-031-128	Old Meter Number	NA		
Data Logger Number	060				

Month & Year	Percent Capture	Average (KW)	Monthly		Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
			Consump. (KWH)	Maximum (KW)						
07/97	93.0	50.8	37,795	119.0	28.8	0.43	483.02	286.67	769.69	
08/97	92.9	48.7	36,233	119.0	24.0	0.41	659.44	286.67	946.11	
09/97	89.9	45.8	32,976	109.9	22.6	0.42	719.21	264.75	983.96	
10/97	75.8	50.7	37,721	114.2	23.5	0.44	822.69	275.11	1,097.80	
11/97	99.3	58.1	41,832	116.6	25.4	0.50	912.36	280.89	1,193.25	
12/97	100.0	67.0	49,848	436.3	26.4	0.15	1,087.18	1,051.05	2,138.23	
01/98	99.9	63.6	47,318	256.3	26.4	0.25	1,049.05	617.43	1,666.48	
02/98	99.9	56.8	38,170	183.8	23.5	0.31	846.22	442.77	1,288.99	
03/98	99.7	48.5	36,084	109.0	24.5	0.44	799.98	262.58	1,062.56	
04/98	98.1	44.0	31,680	107.0	25.0	0.41	628.21	257.76	885.98	
05/98	99.7	37.6	27,974	101.3	22.6	0.37	290.93	244.03	534.97	
06/98	100.0	41.2	29,664	243.8	23.0	0.17	308.51	587.31	895.82	
07/98	99.9	45.4	33,778	262.1	24.5	0.17	431.68	631.40	1,063.08	
08/98	99.7	45.3	33,703	244.8	22.6	0.19	613.40	589.72	1,203.12	
09/98	99.9	44.5	32,040	240.5	22.6	0.19	698.79	579.36	1,278.16	
10/98	99.9	43.9	32,662	312.5	21.1	0.14	712.35	752.81	1,465.16	
11/98	99.9	44.3	31,896	291.8	21.1	0.15	695.65	702.95	1,398.60	
12/98	99.9	57.3	42,631	478.1	24.0	0.12	929.79	1,151.74	2,081.53	
01/99	99.9	62.8	46,723	436.8	24.5	0.14	1,035.85	1,052.25	2,088.10	
02/99	99.9	64.8	43,546	333.6	25.4	0.19	965.41	803.64	1,769.05	
03/99	99.9	62.8	46,723	540.5	24.5	0.12	1,035.85	1,302.06	2,337.92	
04/99	92.6	54.6	39,312	574.1	25.0	0.10	779.56	1,383.01	2,162.56	
05/99	98.5	57.8	43,003	525.6	3.4	0.11	447.23	1,266.17	1,713.40	
06/99	98.8	53.3	38,376	554.4	24.0	0.10	399.11	1,335.55	1,734.66	
Average	97.4	52.1	37,987	283.8	23.3	0.18	722.98	683.65	1,406.63	
Maximum	100.0	67.0	49,848	574.1	28.8	0.50	1,087.18	1,383.01	2,337.92	

METER 95-031-128

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	251-W		
Service (Line,Breaker)	C8-L3, C8X3		Automatic Data
Transformer Number	Feeder		
New Meter Number	69-981-182	Old Meter Number	NA
Data Logger Number	084		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
09/97	99.9	2,048.1	1,474,632	2,790.0	1,738.0	0.73	32,161.72	6,721.11	38,882.83	
10/97	100.0	2,115.4	1,573,858	2,842.0	1,388.0	0.74	34,325.83	6,846.38	41,172.21	
11/97	99.7	2,403.2	1,730,304	3,186.0	1,842.0	0.75	37,737.93	7,675.07	45,413.00	
12/97	100.0	3,064.5	2,279,988	3,990.0	2,282.0	0.77	49,726.54	9,611.91	59,338.45	
01/98	98.9	3,182.4	2,367,706	4,380.0	2,298.0	0.73	52,492.03	10,551.42	63,043.45	
02/98	99.7	2,621.7	1,761,782	3,358.0	2,120.0	0.78	39,058.72	8,089.42	47,148.14	
03/98	99.7	2,268.6	1,687,838	3,226.0	568.0	0.70	37,419.38	7,771.43	45,190.81	Load Transferred.
04/98	98.2	2,052.1	1,477,512	2,556.0	1,696.0	0.80	29,299.06	6,157.40	35,456.47	
05/98	99.5	1,795.7	1,336,001	2,384.0	1,136.0	0.75	13,894.41	5,743.06	19,637.46	
06/98	99.9	1,977.2	1,423,584	2,752.0	1,500.0	0.72	14,805.27	6,629.57	21,434.84	
07/98	99.7	2,193.3	1,631,815	2,846.0	1,758.0	0.77	20,854.60	6,856.01	27,710.61	
08/98	99.7	2,128.7	1,583,753	2,926.0	1,612.0	0.73	28,824.30	7,048.73	35,873.03	
09/98	99.2	2,016.6	1,451,952	2,748.0	1,688.0	0.73	31,667.07	6,619.93	38,287.01	
10/98	99.5	2,008.2	1,494,101	2,494.0	1,524.0	0.81	32,586.34	6,008.05	38,594.38	
11/98	99.3	2,220.8	1,598,976	2,674.0	1,430.0	0.83	34,873.67	6,441.67	41,315.33	
12/98	99.3	2,674.2	1,989,605	3,800.0	2,068.0	0.70	43,393.28	9,154.20	52,547.48	
01/99	99.9	2,509.4	1,866,994	3,148.0	2,056.0	0.80	41,391.25	7,583.53	48,974.78	
02/99	99.7	2,386.3	1,603,594	3,052.0	1,540.0	0.78	35,551.67	7,352.27	42,903.94	
03/99	99.2	2,190.3	1,629,583	2,744.0	1,304.0	0.80	36,127.86	6,610.30	42,738.16	
04/99	99.7	2,041.2	1,469,664	2,458.0	1,420.0	0.83	29,143.44	5,921.32	35,064.76	
05/99	99.9	1,973.6	1,468,358	2,632.0	1,422.0	0.75	15,270.93	6,340.49	21,611.42	
06/99	99.6	1,882.1	1,355,112	3,696.0	1,166.0	0.51	14,093.16	8,903.66	22,996.83	Load Combined.
07/99	99.9	1,898.9	1,412,782	2,562.0	1,410.0	0.74	18,055.35	6,171.86	24,227.21	
08/99	94.5	1,952.7	1,452,809	3,796.0	822.0	0.51	26,441.12	9,144.56	35,585.68	Load Combined.
Average	99.4	2,233.6	1,630,096	3,043.3	1,575.3	0.73	31,216.46	7,331.39	38,547.85	
Maximum	100.0	3,182.4	2,367,706	4,380.0	2,298.0	0.83	52,492.03	10,551.42	63,043.45	

METER 69-981-182

MONTHLY DEMAND PROFILE

RPP-5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	251-W		
Service (Line,Breaker)	C8-L4, C8X4		Automatic Data
Transformer Number	Feeder		
New Meter Number	90-071-271	Old Meter Number	NA
Data Logger Number	084		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
09/97	99.9	1,413.6	1,017,792	1,942.2	999.0	0.73	22,198.04	4,678.76	26,876.80	
10/97	100.0	1,551.1	1,154,018	2,271.6	1,085.4	0.68	25,169.14	5,472.28	30,641.43	
11/97	99.7	1,926.0	1,386,720	2,507.4	1,360.8	0.77	30,244.36	6,040.33	36,284.69	
12/97	100.0	2,014.2	1,498,565	2,710.8	1,474.2	0.74	32,683.70	6,530.32	39,214.02	
01/98	98.9	2,159.7	1,605,817	2,786.4	1,530.0	0.78	35,623.13	6,712.44	42,335.57	
02/98	99.7	2,111.7	1,419,056	2,707.2	1,580.4	0.78	31,460.46	6,521.64	37,982.11	
03/98	99.7	1,891.8	1,407,499	2,556.0	0.0	0.74	31,204.26	6,157.40	37,361.66	Load Transferred.
04/98	98.2	1,692.2	1,218,384	2,358.0	1,279.8	0.72	24,160.55	5,680.42	29,840.98	
05/98	99.5	1,416.8	1,054,099	1,816.2	1,162.8	0.78	10,962.63	4,375.23	15,337.86	
06/98	99.9	1,476.3	1,062,936	2,052.0	1,209.6	0.72	11,054.53	4,943.27	15,997.80	
07/98	99.7	1,527.8	1,136,683	2,142.0	1,060.2	0.71	14,526.81	5,160.08	19,686.89	
08/98	99.7	1,513.2	1,125,821	2,116.8	1,146.6	0.71	20,489.94	5,099.37	25,589.31	
09/98	99.2	1,149.9	827,928	2,070.0	0.0	0.56	18,057.11	4,986.63	23,043.74	Load Transferred.
10/98	99.5	1,601.3	1,191,367	2,282.4	1,198.8	0.70	25,983.72	5,498.30	31,482.02	
11/98	99.3	1,965.4	1,415,088	2,638.8	1,503.0	0.74	30,863.07	6,356.87	37,219.94	
12/98	99.3	2,441.0	1,816,104	3,299.4	1,875.6	0.74	39,609.23	7,948.25	47,557.48	
01/99	99.9	2,320.9	1,726,750	3,137.4	1,809.0	0.74	38,282.04	7,558.00	45,840.04	
02/99	99.7	2,217.0	1,489,824	3,007.8	1,737.0	0.74	33,029.40	7,245.79	40,275.19	
03/99	99.2	1,957.1	1,456,082	2,968.2	1,204.2	0.66	32,281.35	7,150.39	39,431.74	
04/99	99.7	1,695.1	1,220,472	2,453.4	1,339.2	0.69	24,201.96	5,910.24	30,112.20	
05/99	99.9	1,601.5	1,191,516	2,199.6	1,281.6	0.73	12,391.77	5,298.84	17,690.60	
06/99	99.6	1,481.0	1,066,320	2,116.8	0.0	0.70	11,089.73	5,099.37	16,189.10	Load Transferred.
07/99	99.9	1,561.9	1,162,054	2,534.4	1,105.2	0.62	14,851.05	6,105.37	20,956.41	
08/99	94.5	1,655.2	1,231,469	2,176.2	511.2	0.76	22,412.73	5,242.47	27,655.20	
Average	99.4	1,764.2	1,286,807	2,452.1	1,143.9	0.72	24,701.28	5,907.17	30,608.45	
Maximum	100.0	2,441.0	1,816,104	3,299.4	1,875.6	0.78	39,609.23	7,948.25	47,557.48	

METER 90-071-271

MONTHLY DEMAND PROFILE

RPP- 5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	251-W		
Service (Line,Breaker)	C8-L6, C8X6		Automatic Data
Transformer Number	Feeder		
New Meter Number	90-071-275	Old Meter Number	NA
Data Logger Number	084		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
09/97	99.9	2,977.3	2,143,656	3,972.6	1,999.8	0.75	46,753.14	9,569.99	56,323.13	
10/97	100.0	2,857.8	2,126,203	4,566.6	1,789.2	0.63	46,372.49	11,000.94	57,373.43	
11/97	99.7	3,341.9	2,406,168	4,312.8	2,142.0	0.77	52,478.52	10,389.54	62,868.06	
12/97	100.0	3,533.1	2,628,626	4,685.4	2,255.4	0.75	57,330.34	11,287.13	68,617.47	
01/98	98.9	3,197.6	2,379,014	4,806.0	1,827.0	0.67	52,742.75	11,577.65	64,320.40	
02/98	99.7	3,177.7	2,135,414	4,109.4	2,044.8	0.77	47,342.14	9,899.54	57,241.68	
03/98	99.7	3,048.4	2,268,010	3,922.2	0.0	0.78	50,281.77	9,448.58	59,730.35	Load Transferred.
04/98	98.2	2,723.6	1,960,992	3,447.0	1,476.0	0.79	38,886.47	8,303.82	47,190.29	
05/98	99.5	2,664.8	1,982,611	3,198.6	1,477.8	0.83	20,619.16	7,705.43	28,324.58	
06/98	99.9	2,647.8	1,906,416	3,454.2	1,386.0	0.77	19,826.73	8,321.17	28,147.89	
07/98	99.7	2,876.6	2,140,190	3,643.2	1,522.8	0.79	27,351.63	8,776.47	36,128.10	
08/98	99.7	2,449.8	1,822,651	3,587.4	1,449.0	0.68	33,172.25	8,642.05	41,814.30	
09/98	99.2	1,978.9	1,424,808	3,310.2	0.0	0.60	31,075.06	7,974.27	39,049.33	Load Transferred.
10/98	99.5	2,636.2	1,961,333	3,540.6	1,405.8	0.74	42,776.67	8,529.31	51,305.97	
11/98	99.3	2,906.4	2,092,608	3,753.0	1,548.0	0.77	45,639.78	9,040.98	54,680.76	
12/98	99.3	3,001.7	2,233,265	4,024.8	1,695.6	0.75	48,707.51	9,695.74	58,403.25	
01/99	99.9	2,873.7	2,138,033	3,821.4	1,549.8	0.75	47,400.19	9,205.75	56,605.94	
02/99	99.7	3,037.3	2,041,065	3,920.4	1,827.0	0.77	45,250.42	9,444.24	54,694.67	
03/99	99.2	2,311.1	1,719,458	3,330.0	1,450.8	0.69	38,120.39	8,021.97	46,142.36	
04/99	99.7	2,652.7	1,909,944	3,708.0	1,843.2	0.72	37,874.19	8,932.57	46,806.76	
05/99	99.9	2,210.0	1,644,240	2,921.4	1,319.4	0.76	17,100.10	7,037.65	24,137.75	
06/99	99.6	2,107.5	1,517,400	2,766.6	1,409.4	0.76	15,780.96	6,664.74	22,445.70	
07/99	99.9	2,609.2	1,941,245	3,283.2	1,263.6	0.79	24,809.11	7,909.23	32,718.34	
08/99	94.5	1,940.8	1,443,955	3,175.2	1,094.4	0.61	26,279.98	7,649.06	33,929.04	
Average	99.4	2,740.1	1,998,638	3,719.2	1,490.7	0.74	38,082.16	8,959.49	47,041.65	
Maximum	100.0	3,533.1	2,628,626	4,806.0	2,255.4	0.83	57,330.34	11,577.65	68,617.47	

METER 90-071-275

MONTHLY DEMAND PROFILE

RPP- 5228
REVISION 0

ELECTRICITY CONSUMPTION AND COST REPORT

Building	251-W		
Service (Line,Breaker)	C8-L8, C8X8		Automatic Data
Transformer Number	Feeder		
New Meter Number	90-071-278	Old Meter Number	NA
Data Logger Number	084		

Month & Year	Percent Capture	Average (KW)	Monthly Consump. (KWH)	Maximum (KW)	Minimum (KW)	Load Factor	Energy Cost (\$)	Demand Cost (\$)	Total Cost (\$)	Comments
09/97	99.9	143.6	103,392	181.8	19.8	0.79	2,254.98	437.96	2,692.94	
10/97	100.0	152.2	113,237	2,208.6	45.0	0.07	2,469.69	5,320.52	7,790.21	Load Combined.
11/97	99.7	71.3	51,336	156.6	14.4	0.46	1,119.64	377.25	1,496.89	
12/97	100.0	53.8	40,027	144.0	14.4	0.37	872.99	346.90	1,219.89	
01/98	98.9	176.7	131,465	226.8	127.8	0.78	2,914.57	546.36	3,460.94	
02/98	99.7	120.9	81,245	178.2	12.6	0.68	1,801.20	429.28	2,230.48	
03/98	99.7	60.5	45,012	3,173.4	12.6	0.02	997.92	7,644.72	8,642.64	Load Combined.
04/98	98.2	110.9	79,848	172.8	12.6	0.64	1,583.39	416.28	1,999.66	
05/98	99.5	63.8	47,467	154.8	12.6	0.41	493.66	372.91	866.57	
06/98	99.9	113.3	81,576	154.8	12.6	0.73	848.39	372.91	1,221.30	
07/98	99.7	76.6	56,990	154.8	12.6	0.49	728.34	372.91	1,101.25	
08/98	99.7	129.5	96,348	154.8	12.6	0.84	1,753.53	372.91	2,126.45	
09/98	99.2	81.3	58,536	154.8	0.0	0.53	1,276.67	372.91	1,649.58	Load Transferred.
10/98	99.5	77.3	57,511	156.6	12.6	0.49	1,254.32	377.25	1,631.57	
11/98	99.3	548.1	394,632	2,311.2	39.6	0.24	8,606.92	5,567.68	14,174.60	Load Combined.
12/98	99.3	1,063.9	791,542	2,719.8	0.0	0.39	17,263.52	6,552.00	23,815.52	Load Combined.
01/99	99.9	177.4	131,986	196.2	154.8	0.90	2,926.12	472.65	3,398.77	
02/99	99.7	170.8	114,778	192.6	149.4	0.89	2,544.62	463.97	3,008.59	
03/99	99.2	164.9	122,686	187.2	147.6	0.88	2,719.94	450.96	3,170.90	
04/99	99.7	150.4	108,288	187.2	102.6	0.80	2,147.35	450.96	2,598.32	
05/99	99.9	145.7	108,401	421.1	120.6	0.35	1,127.37	1,014.43	2,141.80	
06/99	99.7	132.3	95,256	153.0	90.0	0.86	990.66	368.58	1,359.24	
07/99	99.9	130.0	96,720	147.6	117.0	0.88	1,236.08	355.57	1,591.65	
08/99	94.5	136.5	101,556	151.2	3.6	0.90	1,848.32	364.24	2,212.56	
Average	99.4	177.2	129,576	585.0	52.0	0.30	2,574.17	1,409.25	3,983.43	
Maximum	100.0	1,063.9	791,542	3,173.4	154.8	0.90	17,263.52	7,644.72	23,815.52	

METER 90-071-278

MONTHLY DEMAND PROFILE

**RPP-5228
REVISION 0**

**Appendix C
Scope of Work**

RPP-5228
-REVISION 0

Waste Feed Delivery Phase I
Electrical Power Study

1.0 Objective

The seller shall perform the studies necessary to assess the electrical power requirements for continued safe storage of waste in the SSTs and any additional power required for retrieving waste for Phase I Waste Feed Delivery (WFD). Phase I includes both Phase 1B and 1B prime.

2.0 Scope of Work

This task consists of the following activities:

1. Assess the electrical power required for continued safe storage of waste in the double-shell tanks. This assessment will be performed on a farm by farm basis.
2. Assess the electrical power required to retrieve waste from the DSTs for Phase I WFD. This assessment will assume the simultaneous operation of 2, 300HP mixer pumps per tank farm and the one concurrent transfer of waste from or within any 2 farms in the 200 East Area and from the SY farm in the 200 West Area. The assessments will be estimates of additional power required for support systems.
3. Assess the electrical power required to support the retrieval of waste from a SST.
4. Assess the capability of the electrical system to satisfy the electrical power requirements for continued safe storage of waste in both the SSTs and DSTs in the 200 East area concurrent with DST waste retrieval per activity 2 and retrieval from one SST from A-, AX-, or C-Farm. Assume SST retrieval directly into a DST in the AY-Farm. The electrical power estimate shall include power within the DST Farms for transferring supernatant to the SST. The assessment shall identify electrical power requirements for each tank farm, a proposed source of existing source of power, and any new electrical power capability that may be needed. Estimates of SST safe storage electrical power requirements were provided in a previous study that will be provided.
5. Assess the capability of the electrical system to satisfy the electrical power requirements for continued safe storage of waste in both the SSTs and DSTs in the 200 West area concurrent with DST waste retrieval per activity 2 and the simultaneous retrieval from two SSTs from S-, SX-, or U-Farm. Assume SST retrieval directly into a DST in the SY-Farm. The electrical power estimate shall include power within the DST Farms for transferring supernatant to the SST. The assessment shall identify electrical power requirements for each tank farm, a proposed source of existing source of power, and any new electrical power capability that may be needed. Estimates of SST safe storage electrical power requirements were provided in a previous study that will be provided.

3.0 Deliverables

Report documenting electrical power requirements

Report documenting the assessment of the systems ability to provide the power.

Draft reports to be reviewed by NHC.

Final reports delivered to NHC for approval on September 10, 1999.

4.0 Period of Performance

July 28, 1999 through September 10, 1999. Task point of contact is Charles E. Grenard, Numatec Hanford Corp., 376-3550.

Distribution Continuation Sheet for EDT 628254

		Reason for transmittal	MI-SN
Plant Engineering	Pete Hopkins	3	R2-58
Equipment engineering manager	Al Friberg	3	R1-56
Electrical	Mazen Al-Wazani	3	R1-56
DST Engineering manager	Dan Baide	3	S5-05
Electrical COG	John Wells	3	S5-05
SST Engineering manager	Rich Larson	3	T4-07
Projects	Kitty Bryan	3	R2-58
W-211	Steve Briggs	3	S2-48
W-211 manager	John Van Beek	3	S2-48
W-314	Bob Bevins	3	R3-25
W-314 manager	Jack Lentsch	3	R3-25
W-521	Tom May	3	R3-73
W-521 manager	Greg Mclellan	3	S2-48
Other reviewers			
DYN engineering services	Mike Hache	3	S2-12
Operations	Gary Duncan	3	R3-73
Retrieval Support Ops mgr	Ryan Dodd	3	R3-73
Industrial Safety	Jeff Ranschau	3	S7-07
Integration Services mgr	Susan Alexander	3	S7-86
Nuclear Safety	Peter Smith	3	S7-01
Rad Con	Richard Pierson	3	S6-14
Nuc Safety/License	Dave Hammond	3	R1-49
Environmental	Kathy Tollefson	3	R1-51
RCRA&TSCA Serv mgr	Brad Erlandson	3	R1-51
Quality Assurance	John Bores	3	R2-89
USQs	Katie White	3	S5-13
Program Engineering	Phil Brackenbury	3	R3-73
Retrieval Engineering	Alan Carlson	3	R3-73
Project Definition	Charles Grenard	3	R3-73
Project Definition manager	Tom Conrads	3	R3-73
Waste Feed Delivery	Greg Deweese	3	R3-73
Tank Waste Retrieval & Disposal	Warren Thompson	3	R3-73