

ELECTRICAL LOAD TABULATION

AREA SYSTEM	RF	CONV	NC MAGNETS	WATER SYSTEMS	CYRO	EMER	TOTAL (by Area)	NOTES
SOURCES e-	17.86	0.05	3.48	1.14	0.00	1.09	23.62	
SOURCES e+		0.05			0.00	1.09	1.14	
DR	14.00	0.05	14.01	1.93	3.56	6.17	39.73	
RTML	8.40	3.29	3.22	1.42	2.48	1.68	20.51	
MAIN LINAC	92.98	22.33	1.41	13.21	28.70	3.29	161.92	
BDS	0.00	0.03	17.30	0.00	0.24	0.29	17.86	14mr Values for NC Magnets
DUMPS	0.00	3.23	0.00	3.74	0.00	2.20	9.17	
TOTAL (by System)	133.2	29.0	39.4	21.5	35.0	15.8		

273.9 MW

History

SLAC	133.2	29.0	39.4	21.5	35.0	15.8	273.9	MW
Vancouver	115.0	227.5				15.8	358.3	MW

ELECTRICAL POWER TABULATION

Rev	AREA	MW			NOTES
	e- e+ SOURCES				
	RF Power	17.86		RF	See e-e+ Sources RF
	Conventional Power	0.09		Conv	See e-e+ Sources Conv'l
	NC Magnet Power	3.48		Conv	See e-e+ Sources Magnet
	Water Systems	1.14		Conv	See e-e+ Sources Water
	Emergency Power	2.18		Emer	See e-e+ Emer
	e- DAMPING RING				
	RF Power	7.00		RF	See e- Damping Ring RF
	Conventional Power	0.03		Conv	See e- Damping Ring Conv'l
	NC Magnet Power	4.67		Conv	See e- Damping Ring Magnet
	Water Systems	0.84		Conv	See e- Damping Ring Water
	Cryo Power	1.00		Conv	See e- Damping Ring Cryo
	Emergency Power	3.08		Conv	See e- Damping Ring Emer
	e+ DAMPING RING				
	RF Power	7.00		RF	See e+ Damping Ring RF
	Conventional Power	0.03		Conv	See e+ Damping Ring Conv'l
	NC Magnet Power	9.34		Conv	See e+ Damping Ring Magnet
	Water Systems	1.09		Conv	See e+ Damping Ring Water
	Cryo Power	2.56		Conv	See e+ Damping Ring Cryo
	Emergency Power	3.09		Conv	See e+ Damping Ring Emer
	RTML e- e+				
	RF Power	8.40		RF	See RMTL RF
	Conventional Power	3.29		Conv	See RMTL Conv'l
	NC Magnets	3.22		Conv	See RMTL Magnet
	Water Systems	1.42		Conv	See RTML Water
	Emergency Power	1.68		Conv	See RMTL Emer
	Cryo Power	2.48		Conv	See RTML Cryo
	MAIN LINAC	161.92			
	RF Power		92.98	RF	See Main Linac RF
	Cryo Power		28.70	Conv	See Main Linac Cryo
	NC Magnets		1.41	Conv	See Main Linac Magnet
	Conventional Power		22.33	Conv	See Main Linac Conv'l
	Water Systems		13.21	Conv	See Main Linac Water
	Emergency Power		3.29	Emer	See Main Linac Emer
	DUMPS				
	Conventional Power	3.23		Conv	See Dumps Conv'l
	Water Systems	3.74		Conv	See Dumps Water
	Emergency Power	2.20		Emer	See Dumps Emer
	BEAM DELIVERY SYSTEM (BDS)				
	Conventional Power	0.03			See BDS Conv'l
	NC Magnets	17.30			See BDS Magnet
	Cryo Plants	0.24			See BDS Cryo
	Water Systems	0.00			See BDS Water
	Emergency Power	0.29			See BDS Emer
	LOSSES IN POWER DISTRIBUTION & MOTOR EFFICIENCY	0.00			LATER
	Total (MW)	273.94			
	Total (MVA @0.9PF)	304.38			
	Number of RF Stations (ML)	624			
	Number of RF Stations (e- e+ RTML)	40			

e- e+ SOURCES RF

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
									CCorvin EMail 8-29-06
	RF Power						2530.0	kW	e- Source Total LCW
	RF Power						830.0	kW	e- Source Total Air Chilled
	RF Power						10700.0	kW	e+ Source Total LCW
	RF Power						3800.0	kW	e+ Source Total Air Chilled
							17860.0	kW	Total
	Injector Percentage	Shaft 9	1		3750.6	3750.6		0.21	21%
	Undulator Percentage	Shaft 5	1		4465.0	4465.0		0.25	25%
	Positron Xfer Line Percentage								23%
	Positron Xfer Line Percentage	Shaft 1	1		821.6	821.6		0.046	4.6%
	Positron Xfer Line Percentage	Shaft 2	1		821.6	821.6		0.046	4.6%
	Positron Xfer Line Percentage	Shaft 2.1	1		821.6	821.6		0.046	4.6%
	Positron Xfer Line Percentage	Shaft 3	1		821.6	821.6		0.046	4.6%
	Positron Xfer Line Percentage	Shaft 3.1	1		821.6	821.6		0.046	4.6%
	Keep Alive & Bstr Percentage	Shaft 4	1		5536.6	5536.6		0.31	31%
	NOTES						17860.0		Total kW
	Total Values and Percentages per CCorvin EMail 8-29-06						17.9		Total MW

e- e+ SOURCES CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	FCU	Service Tunnel	0		0.746	0.0			
	Dehumidifiers	Beam Tunnel	0		3.8	0.0			
							0.0		
	Lighting	Beam Tunnel	875		0.05	43.8		Normally OFF	Assume spacing as per Main Linac
	Lighting	Service Tunnel	875		0.05	43.8			Assume spacing as per Main Linac
	Lighting	Crossover	135		0.05	6.8		Assume 15% for Cross-Overs	
							94.3		
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Welding Recept	Service Tunnel	1		40.0	0.0			Normally OFF
							0.0		
							94.3		
							94.3	Total (kW)	
							0.1	Total (MW)	

e- e+ SOURCES MAGNETS

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	NC MAGNETS								
	e- e+ Source		1		3480.0	3480.0			PBellomo EMail 8-27-06
							3480.0	Total (kW)	
							3.5	Total (MW)	

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e-e+ SOURCES SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
									From Main Linac Water 285.0 Value Used for Scaling
	Chilled Water Pumps								
	Percentage							1.56	156%
	Chilled Water Pumps	Shaft 4	1		177.82	177.8			156% Total Use 60% for Main Linac Use 40% for e-e+Source
							177.8		
	Chilled Water Pumps								
	Percentage							1.44	144%
	Chilled Water Pumps	Shaft 5	1		139.52	139.5			144% Total Use 66% for Main Linac Use 34% for e-Source
							139.5		
	Chilled Water Pumps								
	Percentage							0.12	12%
	Chilled Water Pumps	Shaft 9	1		34.20	34.2			Values Determined by Multiplier From Shaft 7
							34.2		
	Chiller								
	Chiller	Shaft 9 Bldg	1		109.0	109.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 9 Bldg	0		55.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							109.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 9 Bldg	1	30.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	1	15.0	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 9 Bldg	1	7.5	0.746	5.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 9 Bldg	1		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 9 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 9 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							39.2		
	SUBTOTAL CHILLED WATER (kW)					499.7	499.7		
	PROCESS WATER SYSTEM								
	20Deg Delta								
	Process Water Pumps								From Main Linac Water 459.5 Value Used for Scaling
	Process Water Pumps								
	Percentage							1.56	156%
	Process Water Pumps	Shaft 4	1		286.75	286.8			156% Total Use 60% for Main Linac Use 40% for e-e+Source
							286.8		
	Process Water Pumps								
	Percentage							1.44	144%
	Process Water Pumps	Shaft 5	1		224.99	225.0			144% Total Use 66% for Main Linac Use 34% for e-e+Source
							225.0		
	Process Water Pumps								
	Percentage							0.12	12%
	Process Water Pumps	Shaft 9	1		55.14	55.1			Values Determined by Multiplier From Shaft 7

e-e+ SOURCES SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
							55.1		
	Cooling Towers								
	Cooling Tower Fan	Shaft 9 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 9 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 9 Bldg	2		21.0	0.0		Standy - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 9 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 9 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 9 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	SUBTOTAL PROCESSED WATER (kW)					645.2	645.2		
		Water System (kW)					1144.9		
		Water System (MW)					1.1		

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e-e+ SOURCES EMERGENCY

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting		87		0.05	4.4			
	Emer Lighting		87		0.05	4.4			
	Exit Signs						8.7		
	FA System								
	Paging System								
	Exhaust & Supply Fans								
	Vent Fan-Supply	Shaft 9	6	15.0	0.746	67.1			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 9	6		350.0	2100.0			LHammond EMail 6-29-06
							2167.1		
							2175.8	Total (kW)	
							2.2	Total (MW)	



e- DAMPING RING CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Lighting	Beam Tunnel	232		0.05	11.6		Normally OFF	Assume spacing as per Main Linac
	Lighting	Service Tunnel	232		0.05	11.6			Assume spacing as per Main Linac
	Lighting	Crossover	78		0.05	3.9		Assume 15% for Cross-Overs	
							27.1		
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Welding Recept	Service Tunnel	1		40.0	0.0			Normally OFF
							0.0		
							27.1	Total (kW)	
							0.0	Total (MW)	

e- DAMPING RING MAGNETS

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	NC MAGNETS								
	e- Damping Ring		1		4670.0	4670.0			PBellomo EMail 8-27-06 AWolski EMail 8-21-06
							4670.0		SubTotal (kW)
							4670.0		Total (kW)
							4.7		Total (MW)

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e- DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
									From Main Linac Water 285.0 Value Used for Scaling
	Chilled Water Pumps								
	Percentage							0.04	4%
	Chilled Water Pumps	Shaft 17	1		11.40	11.4			Values Determined by Multiplier From Shaft 7
							11.4		
	Chiller								
	Chiller	Shaft 17 Bldg	1		75.0	75.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 17 Bldg	0		38.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							75.0		
	Chilled Water Pumps								
	Percentage							0.04	4%
	Chilled Water Pumps	Shaft 15	1		11.40	11.4			Values Determined by Multiplier From Shaft 7
							11.4		
	Chiller								
	Chiller	Shaft 15 Bldg	1		75.0	75.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 5 Bldg	0		38.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							75.0		
	Chilled Water Pumps								
	Percentage							0.04	4%
	Chilled Water Pumps	Shaft 19	1		11.40	11.4			Values Determined by Multiplier From Shaft 7
							11.4		
	Chiller								
	Chiller	Shaft 19 Bldg	1		75.0	75.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 19 Bldg	0		38.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							75.0		
	Chilled Water Pumps								
	Percentage							0.04	4%
	Chilled Water Pumps	Shaft 13	1		11.40	11.4			Values Determined by Multiplier From Shaft 7
							11.4		
	Chiller								
	Chiller	Shaft 13 Bldg	1		75.0	75.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 13 Bldg	0		38.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							75.0		
	SUBTOTAL CHILLED WATER (kW)					345.6	345.6		
									From Main Linac Water 459.5 Value Used for Scaling
	Process Water Pumps								
	Percentage							0.10	10%
	Process Water Pumps	Shaft 17	1		45.95	46.0			Values Determined by Multiplier From Shaft 7
							46.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 17 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 17 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 17 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 17 Bldg	2		21.0	0.0		Standy - Winter Only	Values Determined by Multiplier From Shaft 7

e- DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Fan	Shaft 17 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 17 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 17 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 17 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.10	10%
	Process Water Pumps	Shaft 15	1		45.95	46.0			Values Determined by Multiplier From Shaft 7
							46.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 15 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 15 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 15 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 15 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 15 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 15 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 15 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 15 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.10	10%
	Process Water Pumps	Shaft 19	1		45.95	46.0			Values Determined by Multiplier From Shaft 7
							46.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 19 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 19 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 19 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 19 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 19 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 19 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 19 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 19 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.10	10%
	Process Water Pumps	Shaft 13	1		45.95	46.0			Values Determined by Multiplier From Shaft 7
							46.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 13 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 13 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 13 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7

e- DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Immersion Htr	Shaft 13 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 13 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 13 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 13 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 13 Bldg	1	0.0	21.0	0.0		Standby- Winter Only	Values Determined by Multiplier From Shaft 7
							78.3		
	SUBTOTAL PROCESSED WATER (kW)					497.1	497.1		
		Water System (kW)				842.7	842.7		
		Water System (MW)				0.8	0.8		

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e- DAMPING RING CRYO

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Cryo	Shaft 13	1		250.0	250.0		Installed Power 400kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 15	1		250.0	250.0		Installed Power 400kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 17	1		250.0	250.0		Installed Power 400kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 19	1		250.0	250.0		Installed Power 400kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Note						1000.0		Total (kW)
	E-Mail 3-31-06 T Peterson						1.0		Total (MW)
	T. Peterson 8-1-06								
	TPeterson Email 8-3-06								

e- DAMPING RING EMERGENCY

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting		10		0.05	0.5			
	Emer Lighting		10		0.05	0.5			
	Emer Lighting		10		0.05	0.5			
	Exit Signs						1.5		
	FA System								
	Paging System								
	Exhaust & Supply Fans								
	Vent Fan-Supply	Shaft 17	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 17	4		350.0	1400.0			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 15	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 19	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Supply	Shaft 13	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 13	4		350.0	1400.0			LHammond EMail 6-29-06
							3068.6		
	Sump Pumps								
	Sump Pump	Shaft 17	1	20.0	0.746	14.9		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 17	0	20.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 17	0	20.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
							14.9		
						3085.0	3085.0	Total (kW)	
							3.1	Total (MW)	

e+ DAMPING RING RF

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	RF Power								
	RF Power Base Value	Alcoves	1		6300.00	6300.00			AWolski EMail 8-21-06
	RF Power Peak Overhead	Tunnel	1		700.00	700.00			AWolski EMail 8-21-06
	NOTES						7000.0		Total kW
	ILC Damping Rings Magnet Power Requirements 8-21-06						7.0		Total MW

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e+ DAMPING RING CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Lighting	Beam Tunnel	232		0.05	11.6		Normally OFF	Assume spacing as per Main Linac
	Lighting	Service Tunnel	232		0.05	11.6			Assume spacing as per Main Linac
	Lighting	Crossover	78		0.05	3.9		Assume 15% for Cross-Overs	
							27.1		
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Welding Recept	Service Tunnel	1		40.0	0.0			Normally OFF
							0.0		
							27.1	Total (kW)	
							0.0	Total (MW)	

e+ DAMPING RING MAGNETS

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	NC MAGNETS								
	e+ Damping Ring		2		4670.0	9340.0			PBellomo EMail 8-27-06 AWolski EMail 8-21-06
							9340.0		SubTotal (kW)
							9340.0 Total (kW)		
							9.3 Total (MW)		

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e+ DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
									From Main Linac Water 285.0 Value Used for Scaling
	Chilled Water Pumps								
	Percentage							0.06	6%
	Chilled Water Pumps	Shaft 12	1		17.10	17.1			Values Determined by Multiplier From Shaft 7
							17.1		
	Chiller								
	Chiller	Shaft 12 Bldg	1		112.0	112.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 12 Bldg	0		57.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							112.0		
	Chilled Water Pumps								
	Percentage							0.06	6%
	Chilled Water Pumps	Shaft 14	1		17.10	17.1			Values Determined by Multiplier From Shaft 7
							17.1		
	Chiller								
	Chiller	Shaft 14 Bldg	1		112.0	112.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 14 Bldg	0		57.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							112.0		
	Chilled Water Pumps								
	Percentage							0.06	6%
	Chilled Water Pumps	Shaft 16	1		17.10	17.1			Values Determined by Multiplier From Shaft 7
							17.1		
	Chiller								
	Chiller	Shaft 16 Bldg	1		112.0	112.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 16 Bldg	0		57.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							112.0		
	Chilled Water Pumps								
	Percentage							0.06	6%
	Chilled Water Pumps	Shaft 18	1		17.10	17.1			Values Determined by Multiplier From Shaft 7
							17.1		
	Chiller								
	Chiller	Shaft 18 Bldg	1		112.0	112.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 18 Bldg	0		57.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							112.0		
	SUBTOTAL CHILLED WATER (kW)					516.4	516.4		
	PROCESS WATER SYSTEM								
	20Deg Delta								
									From Main Linac Water 459.5 Value Used for Scaling
	Process Water Pumps								
	Percentage							0.13	13%
	Process Water Pumps	Shaft 12	1		59.74	59.7			Values Determined by Multiplier From Shaft 7
							59.7		
	Cooling Towers								
	Cooling Tower Fan	Shaft 12 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 12 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7

e+ DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Spray Pump	Shaft 12 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 12 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 12 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 12 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 12 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 12 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.13	13%
	Process Water Pumps	Shaft 14	1		59.74	59.7			Values Determined by Multiplier From Shaft 7
							59.7		
	Cooling Towers								
	Cooling Tower Fan	Shaft 14 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 14 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 14 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 14 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 14 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 14 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 14 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 14 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.13	13%
	Process Water Pumps	Shaft 18	1		59.74	59.7			Values Determined by Multiplier From Shaft 7
							59.7		
	Cooling Towers								
	Cooling Tower Fan	Shaft 18 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 18 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 18 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 18 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 18 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 18 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 18 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 18 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Process Water Pumps								
	Percentage							0.13	13%
	Process Water Pumps	Shaft 16	1		59.74	59.7			Values Determined by Multiplier From Shaft 7
							59.7		
	Cooling Towers								
	Cooling Tower Fan	Shaft 16 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7

e+ DAMPING RING SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Fan	Shaft 16 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 16 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 16 Bldg	1		21.0	21.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 16 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 16 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 16 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 16 Bldg	1		21.0	0.0		Standby- Winter Only	Values Determined by Multiplier From Shaft 7
							99.3		
	SUBTOTAL PROCESSED WATER (kW)					573.3	573.3		
		Water System (kW)				1089.7	1089.7		
		Water System (MW)				1.1	1.1		

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e+ DAMPING RING CRYO

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Cryo	Shaft 12	1		640.0	640.0		Installed Power 960kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 14	1		640.0	640.0		Installed Power 960kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 16	1		640.0	640.0		Installed Power 960kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 18	1		640.0	640.0		Installed Power 960kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Note						2560.0		Total (kW)
	E-Mail 3-31-06 T Peterson						2.6		Total (MW)
	T. Peterson 8-1-06								
	TPeterson Email 8-3-06								

e+ DAMPING RING EMERGENCY

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting		23		0.05	1.2			
	Emer Lighting		23		0.05	1.2			
	Exit Signs						2.3		
	FA System								
	Paging System						0.0		
	Exhaust & Supply Fans								
	Vent Fan-Supply	Shaft 12	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 12	4		350.0	1400.0			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 14	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 18	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Supply	Shaft 16	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 16	4		350.0	1400.0			LHammond EMail 6-29-06
	Sump Pumps								LHammond EMail 6-29-06
	Sump Pump	Shaft 16	1	20.0	0.746	14.9		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 16	0	20.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 16	0	20.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
							3083.5		
							3085.8	Total (kW)	
							3.1	Total (MW)	

RTML RF

Rev	Service	Location	QTY			Load ea (kW)	Load Total	Notes	Reference
	e- e+ RTML		40			210.0	8400.0		RLarsen EMail Dated 5-22-06 Verify 210.0kW or 149kW as per Main Linac
							8400.0		Total kW
							8.4		Total MW

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RTML CONVENTIONAL

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Rack Power	Service Tunnel	0		30.0	0.0			Included Below
	RF Water Skid (LCW)	Service Tunnel	0	5.0	0.746	0.0			Included Below
	RF Water Skid (LCW)	Service Tunnel	0	5.0	0.746	0.0			Included Below
	Water Cooled Rack	Service Tunnel	0	5.0	0.746	0.0			Included Below
	Water Cooled Rack	Service Tunnel	0	5.0	0.746	0.0			Included Below
	Welding Recept	Service Tunnel	0		40.0	0.0			Normally OFF
	Welding Recept	Beam Tunnel	0		40.0	0.0			Normally OFF
	FCU	Service Tunnel	559	1.5	0.746	625.5		Assume 1 FCU every 18m 1-1.5HP Motor	LHammond EMail 6-29-06 (Similar)
	Dehumidifiers	Beam Tunnel	93		6.1	567.3		1 Dehumidifier every 108m	LHammond EMail 6-29-06 (Similar)
							1192.8		Subtotal (kW)
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3- 120V, 20A, twist-lock; 2- 120V, 20A, duplex & 2- 208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4- 208V, 20A	Normally OFF
	Lighting	Beam Tunnel	1678		0.05	0.0		Assume same Criteria as Main Linac (1 per 3m)	Normally OFF
	Lighting	Service Tunnel	1678		0.05	83.9		Assume same Criteria as Main Linac (1 per 3m)	
	Lighting	Crossover	335		0.05	16.8		Assume 10% for Cross- Overs	
							100.7		Subtotal (kW)
									40.0 Number of RF Station
	Use the Following Additional Information:								
	e- RTML Misc Racks, etc		1		1000.0	1000.0			ILC Wiki 3-31-06
	e+ RTML Misc Racks, etc		1		1000.0	1000.0			ILC Wiki 3-31-06
							2000.0		Subtotal Misc (kW)
							3293.5		Total (kW)
							3.3		Total (MW)

RTML MAGNETS

Rev	Service	Location	QTY	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	NC MAGNETS							
	e- RTML		1	1612.0	1612.0			PBellomo EMail 8-27-06 ILC Wiki 3-31-06
	e+ RTML		1	1612.0	1612.0			PBellomo EMail 8-27-06 ILC Wiki 3-31-06
						3224.0		SubtotalTotal (kW)
						3224.0		Total (kW)
						3.2		Total (MW)

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RTML SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
									From Main Linac Water 285.0 Value Used for Scaling
	Chilled Water Pumps								
	Percentage							0.22	22%
	Chilled Water Pumps	Shaft 11	1		62.69	62.7			Values Determined by Multiplier From Shaft 7
							62.7		
	Chiller								
	Chiller	Shaft 11 Bldg	1		201.0	201.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 11 Bldg	0		101.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							201.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 11 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 11 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 11 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 11 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 11 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Chilled Water Pumps								
	Percentage							0.22	22%
	Chilled Water Pumps	Shaft 8	1		62.69	62.7			Values Determined by Multiplier From Shaft 7
							62.7		
	Chiller								
	Chiller	Shaft 8 Bldg	1		201.0	201.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 8 Bldg	0		101.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							201.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 8 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 8 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 8 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 8 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 8 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	SUBTOTAL CHILLED WATER (kW)					684.0	684.0		

RTML SURFACE WATER

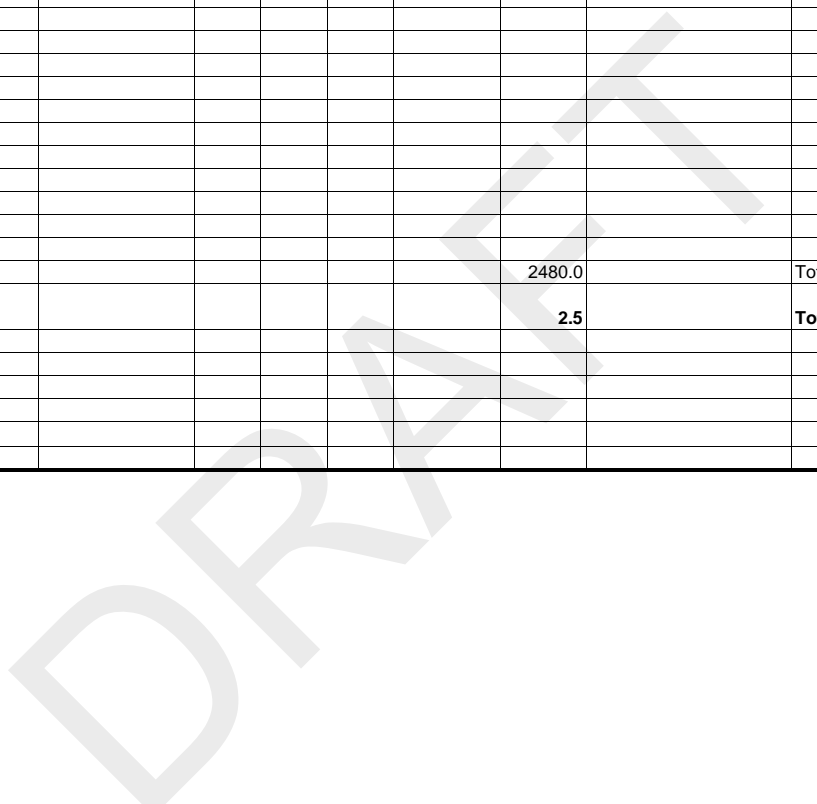
Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	PROCESS WATER SYSTEM 20Deg Delta								
									From Main Linac Water 459.5 Value Used for Scaling
	Process Water Pumps								
	Percentage							0.38	38%
	Process Water Pumps	Shaft 11	1		174.62	174.6			Values Determined by Multiplier From Shaft 7
							174.6		
	Cooling Towers								
	Cooling Tower Fan	Shaft 11 Bldg	5	30.0	0.746	111.9		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	5	15.0	0.746	56.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 11 Bldg	5	7.5	0.746	28.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 11 Bldg	5		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 11 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 11 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 11 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							195.8		
	Process Water Pumps								
	Percentage							0.38	38%
	Process Water Pumps	Shaft 8	1		174.62	174.6			Values Determined by Multiplier From Shaft 7
							174.6		
	Cooling Towers								
	Cooling Tower Fan	Shaft 8 Bldg	5	30.0	0.746	111.9		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	5	15.0	0.746	56.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 8 Bldg	5	7.5	0.746	28.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 8 Bldg	5		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 8 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 8 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 8 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							195.8		
	SUBTOTAL PROCESSED WATER (kW)					740.9	740.9		
		Water System (kW)				1424.9	1424.9		
		Water System (MW)				1.4	1.4		

RTML EMERGENCY

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	e- RTML								
	Emer Lighting	Beam Tunnel	2		0.05	0.1			Assume 2 per RF Sta
	Emer Lighting	Service Tunnel	2		0.05	0.1			Assume 2 per RF Sta
	Emer Lighting	Crossover	3		0.05	0.2			Assume 3 per Cross-Overs
	Exit Signs								
	Exhaust & Supply Fans						0.4		
	Vent Fan-Exhaust	Shaft 11A	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Supply	Shaft 8	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 8	4		350.0	1400.0			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 10B	8	15.0	0.746	89.5			LHammond EMail 6-29-06
							1623.8		
	Sump Pumps								
	Sump Pump	Shaft 11	1	40.0	0.746	29.8		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 11	0	40.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 11	0	40.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 10	1	40.0	0.746	29.8		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 10	0	40.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 10	0	40.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
							59.7		e+ RTML-Subtotal
						1683.8	1683.8	Total (kW)	
							1.7	Total (MW)	

RTML CRYO

Rev	Service	Location	QTY	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Cryo	Shaft 10	1	1240.0	1240.0		Installed Power 1740kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 11	1	1240.0	1240.0		Installed Power 1740kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Note					2480.0		Total RTML & Sources (kW)
	E-Mail 3-31-06 T Peterson							
	T. Peterson 8-1-06					2.5		Total RTML & Sources (MW)
	TPeterson Email 8-3-06							



MAIN LINAC RF

Rev	Service	Location	QTY			Load ea (kW)	Load Total	Notes	Reference
	AC Power per RF Station						149.0 kW		E-Mail Dated 4-17-06 & 4-18-06 Jensen 166kVA 0.9pf or 149.4kW
	Number of Active Stations		624						Corvin Email 8-7-06 (PF)
							92976.0	TOTAL (kW)	
							93.0	TOTAL (MW)	

MAIN LINAC CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Rack Power	Service Tunnel	1		27.0	27.0			ML Subrack List (Fakuda-Bangalore) Assume 0.9 pf of 30kVA
	RF Water Skid (LCW)	Service Tunnel	0.5	10.0	0.746	3.7		1 Water Skid per 2 RF Sta; Operating 10Hp	EHuedem Email 8-28-06 EHuedem LCW Skids 8-21-06 EHuedem Email 8-14-06 EHuedem Email 5-8-06
	Water Cooled Rack	Service Tunnel	0.25	5.0	0.746	0.0		1 Water Cooled Rack Every 4 RF Stations ; 5HP Motor @ 7.6A ea (Operating)	EHuedem Email 5-8-06
	Water Cooled Rack	Service Tunnel	0	5.0	0.746	0.0		1 Water Cooled Rack Every 4 RF Stations; 5HP Motor @ 7.6A ea (Standby)	EHuedem Email 5-8-06
	Welding Recept	Service Tunnel	0		40.0	0.0			Normally OFF
	Welding Recept	Beam Tunnel	0		40.0	0.0			Normally OFF
	FCU	Service Tunnel	2	1.5	0.746	2.2		2 FCU every RF Station; 1-1.5HP Motor	LHammond Email 6-29-06
	Dehumidifiers	Beam Tunnel	0.33		6.1	2.0		1 Dehumidifier every 108m	LHammond Email 6-29-06
							35.0		Subtotal (kW)
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Lighting	Beam Tunnel	0		0.05	0.0		Assume 12 per RF Sta	Normally OFF
	Lighting	Service Tunnel	12		0.05	0.6		Assume 12 per RF Sta	
	Lighting	Crossover	4		0.05	0.2		Assume 15% for Cross-Overs	
							0.8		Subtotal (kW)
						35.8	35.8		Total (kW) per RF Station
								624	Number of RF Station
							22331.1		SubTotal (kW)
							22.3		

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
	Water Loads Scaled Based on Shaft 7 Tabulated Loads								
	Chilled Water Pumps								
	Percentage							0.50	50%
	Chilled Water Pumps	Shaft 2	1		142.49	142.5	142.5		Values Determined by Multiplier From Shaft 7
	Chiller								
	Chiller	Shaft 2 Bldg	1		454.0	454.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 2 Bldg	0		227.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							454.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 2 Bldg	3	30.0	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	3	15.0	0.746	33.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 2 Bldg	3	7.5	0.746	16.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 2 Bldg	3		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	2	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	2	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 2 Bldg	2	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 2 Bldg	2		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							117.5		
	Chilled Water Pumps								
	Percentage							0.50	50%
	Chilled Water Pumps	Shaft 3	1		142.49	142.5	142.5		Values Determined by Multiplier From Shaft 7
	Chiller								
	Chiller	Shaft 3 Bldg	1		454.0	454.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 3 Bldg	0		227.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							454.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 3 Bldg	3	30.0	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	3	15.0	0.746	33.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 3 Bldg	3	7.5	0.746	16.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 3 Bldg	3		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 3 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 3 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							117.5		
	Chilled Water Pumps								
	Percentage							1.56	156%
	Chilled Water Pumps	Shaft 4	1		266.73	266.7	266.7		156% Total Use 60% for Main Linac 40% for e-e+Source Use
	Chiller								

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Chiller	Shaft 4 Bldg	1		1408.0	1408.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 4 Bldg	0		705.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							1408.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 4 Bldg	8	30.0	0.746	179.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 4 Bldg	8	15.0	0.746	89.5		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 4 Bldg	8	7.5	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 4 Bldg	8		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 4 Bldg	1	30.0	0	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 4 Bldg	1	15.0	0	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 4 Bldg	1	7.5	0	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 4 Bldg	1		0.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							313.3		
	Chilled Water Pumps								
	Percentage							1.44	144% Total Use 66% for Main Linac Use 34% for e-Source
	Chilled Water Pumps	Shaft 5	1		270.84	270.8			Values Determined by Multiplier From Shaft 7
							270.8		
	Chiller								
	Chiller	Shaft 5 Bldg	1		1299.0	1299.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 5 Bldg	0		650.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							1299.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 5 Bldg	8	30.0	0.746	179.0		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	8	15.0	0.746	89.5		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 5 Bldg	8	7.5	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 5 Bldg	8		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 5 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 5 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							313.3		
	Chilled Water Pumps								
	Percentage							1.00	100%
	Chilled Water Pumps	Shaft 6	1		284.97	285.0			Values Determined by Multiplier From Shaft 7
							285.0		
	Chiller								
	Chiller	Shaft 6 Bldg	1		905.0	905.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 6 Bldg	0		453.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							905.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 6 Bldg	6	30.0	0.746	134.3		Operating	Values Determined by Multiplier From Shaft 7

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Fan	Shaft 6 Bldg	6	15.0	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 6 Bldg	6	7.5	0.746	33.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 6 Bldg	6		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 6 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 6 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 6 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 6 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							235.0		
	Chilled Water Pumps								
	Cooling Tower Pump	Shaft 7 Bldg	1	97.0	0.746	72.4		Operating 97Bhp; 125Hp	Ehuedem Email 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Pump	Shaft 7 Bldg	1	97.0	0.746	0.0		Standby 125Hp	97Bhp; Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller Pump	Shaft 7 Bldg	1	83.0	0.746	61.9		Operating 100Hp	83Bhp; Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller Pump	Shaft 7 Bldg	1	83.0	0.746	0.0		Standby 100Hp	83Bhp; Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller Distribution Pump	Shaft 7 Cavern	1	101.0	0.746	75.3		Operating 101Bhp; 125Hp	Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller Distribution Pump	Shaft 7 Cavern	1	101.0	0.746	75.3		Operating 101Bhp; 125Hp	Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller Distribution Pump	Shaft 7 Cavern	1	101.0	0.746	0.0		Standby 101Bhp; 125Hp	Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
							285.0		VALUE FOR SCALING
	Chiller								
	Chiller	Shaft 7 Bldg	1		905.0	905.0		Operating	Ehuedem Email 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Chiller	Shaft 7 Bldg	0		453.0	0.0		Spare	Ehuedem Email 8-28-06 EHuedem Email 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
							905.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 7 Bldg	6	30.0	0.746	134.3		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	6	15.0	0.746	67.1		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Spray Pump	Shaft 7 Bldg	6	7.5	0.746	33.6		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Immersion Htr	Shaft 7 Bldg	0		21.0	0.0		Standby - Winter Only	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	1	30.0	0.746	0.0		Standby	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	1	15.0	0.746	0.0		Standby	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Spray Pump	Shaft 7 Bldg	1	7.5	0.746	0.0		Standby	EHuedem EMail 6-13-06
	Cooling Tower Immersion Htr	Shaft 7 Bldg	1		21.0	0.0		Standby	EHuedem EMail 5-22-06
							235.0		EHuedem EMail 6-13-06
									EHuedem EMail 5-22-06
	SUBTOTAL CHILLED WATER (kW)					8149.1	8149.1		
	PROCESS WATER SYSTEM								
	20Deg Delta								
	Water Loads Scaled Based on Shaft 7 Tabulated Loads								
	Process Water								
	20Deg Delta								
	Process Water Pumps								
	Percentage							0.50	50%
	Process Water Pumps	Shaft 2	1		229.77	229.8			Values Determined by Multiplier From Shaft 7
							229.8		
	Cooling Towers								
	Cooling Tower Fan	Shaft 2 Bldg	6	30.0	0.746	134.3		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	6	15.0	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 2 Bldg	6	7.5	0.746	33.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 2 Bldg	6		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 2 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 2 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 2 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							235.0		
	Process Water Pumps								
	Percentage							0.50	50%
	Process Water Pumps	Shaft 3	1		229.77	229.8			Values Determined by Multiplier From Shaft 7
							229.8		
	Cooling Towers								
	Cooling Tower Fan	Shaft 3 Bldg	6	30.0	0.746	134.3		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	6	15.0	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 3 Bldg	6	7.5	0.746	33.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 3 Bldg	6		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 3 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 3 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 3 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							235.0		
	Process Water Pumps								
	Percentage							1.55	155%
	Process Water Pumps	Shaft 4	1		427.37	427.4			155% Total Use 60% for Main Linac Use 40% for e-e+Source
							427.4		
	Cooling Towers								
	Cooling Tower Fan	Shaft 4 Bldg	19	30.0	0.746	425.2		Operating	Values Determined by Multiplier From Shaft 7

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Fan	Shaft 4 Bldg	19	15.0	0.746	212.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 4 Bldg	19	7.5	0.746	106.3		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 4 Bldg	19		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 4 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 4 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 4 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 4 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							744.1		
	Process Water Pumps								
	Percentage							1.43	143%
	Process Water Pumps	Shaft 5	1		433.71	433.7			143% Total Use 66% for Main Linac Use 34% for e-e+Source
							433.7		
	Cooling Towers								
	Cooling Tower Fan	Shaft 5 Bldg	17	30.0	0.746	380.5		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	17	15.0	0.746	190.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 5 Bldg	17	7.5	0.746	95.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 5 Bldg	17		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 5 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 5 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 5 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							665.8		
	Process Water 20Deg Delta								
	Percentage							1.00	100%
	Process Water Pumps	Shaft 6	1		459.5	459.5			Values Determined by Multiplier From Shaft 7
							459.5		
	Cooling Towers								
	Cooling Tower Fan	Shaft 6 Bldg	12	30.0	0.746	268.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 6 Bldg	12	15.0	0.746	134.3		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 6 Bldg	12	7.5	0.746	67.1		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 6 Bldg	12		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 6 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 6 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 6 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 6 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							470.0		
	Cooling Towers								
	Cooling Tower Pump	Shaft 7 Bldg	1	141.0	0.746	105.2		Operating; 141BHp; 175Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06

MAIN LINAC WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Cooling Tower Pump	Shaft 7 Bldg	1	141.0	0.746	105.2		Operating; 141BHp; 175Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Pump	Shaft 7 Bldg	1	140.0	0.746	0.0		Standby; 141BHp; 175Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Process Water Pump	Shaft 7 Cavern	1	167.0	0.746	124.6		Operating; 167BHp; 200Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Process Water Pump	Shaft 7 Cavern	1	167.0	0.746	124.6		Operating; 167BHp; 200Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Process Water Pump	Shaft 7 Cavern	1	167.0	0.746	0.0		Standby; 167BHp; 200Hp	EHuedem EMail 8-28-06 EHuedem EMail 8-10-06 EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
							459.5		VALUE FOR SCALING
	Cooling Towers								
	Cooling Tower Fan	Shaft 7 Bldg	12	30.0	0.746	268.6		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	12	15.0	0.746	134.3		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Spray Pump	Shaft 7 Bldg	12	7.5	0.746	67.1		Operating	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Immersion Htr	Shaft 7 Bldg	0		21.0	0.0		Operating-Winter Only; 12 Total	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	1	30.0	0	0.0		Standby	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Fan	Shaft 7 Bldg	1	15.0	0	0.0		Standby	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Spray Pump	Shaft 7 Bldg	1	7.5	0	0.0		Standby	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
	Cooling Tower Immersion Htr	Shaft 7 Bldg	1	0.0	0.0	0.0		Standby- Winter Only	EHuedem EMail 6-13-06 EHuedem EMail 5-22-06
							470.0		
	SUBTOTAL PROCESSED WATER (kW)					5059.6	5059.6		
		Water System (kW)				13208.7	13208.7		
		Water System (MW)				13.2	13.2		

MAIN LINAC EMERGENCY

Rev	Service	Location	QTY	Hp	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting	Beam Tunnel	2		0.05	0.1			Assume 2 per RF Sta
	Emer Lighting	Service Tunnel	2		0.05	0.1			Assume 2 per RF Sta
	Emer Lighting	Crossover	3		0.05	0.2			Assume 3 per Cross-Overs
	Exit Signs						0.4		
	FA System								
	Paging System								
	Exhaust & Supply Fans								
	Vent Fan-Exhaust	Shaft 7	8	15.0	0.746	89.5			LHammond EMail 6-29-06
	Vent Fan-Supply	Shaft 5	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 5	4		350.0	1400.0			LHammond EMail 6-29-06
	Vent Fan-Supply	Shaft 4	4	15.0	0.746	44.8			LHammond EMail 6-29-06
	Dehumidifier-Surface	Shaft 4	4		350.0	1400.0			LHammond EMail 6-29-06
	Vent Fan-Exhaust	Shaft 6	8	15.0	0.746	89.5			LHammond EMail 6-29-06
							3068.6		
	Sump Pumps								
	Sump Pump	Shaft 7	1	75.0	0.746	56.0		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 7	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 7	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 5	1	75.0	0.746	56.0		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 5	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 5	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 4	1	75.0	0.746	56.0		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 4	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 4	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 6	1	75.0	0.746	56.0		Operating	LHammond EMail 6-29-06
	Sump Pump	Shaft 6	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
	Sump Pump	Shaft 6	0	75.0	0.746	0.0		Stand By	LHammond EMail 6-29-06
							223.8		
						3292.7	3292.7	Total (kW)	
							3.3	Total (MW)	

DUMPS CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	18MW Beam Dump Pumps		2		500.0	1000.0			Beam Dump Parameters 5-7-06
	18MW Beam Dump Pumps		2		500.0	1000.0			Beam Dump Parameters 5-7-06
	18MW Beam Dump Pumps		2		500.0	1000.0			Beam Dump Parameters 5-7-06
	3.2MW Beam Dump Pumps		2		100.0	200.0			Beam Dump Parameters 5-7-06
							3200.0		
	FCU				0.746	0.0			
	Dehumidifiers					0.0			
	FCU		2	1.5	0.746	2.2			2 FCU every 108m; 1-1.5HP Motor
							2.2		
	Lighting	Beam Tunnel	250		0.05	12.5		Normally OFF	WAG
	Lighting	Service Tunnel	250		0.05	12.5			WAG
	Lighting	Crossover	40		0.05	2.0		Assume 15% for Cross-Overs	WAG
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Welding Recept	Service Tunnel	1		40.0	0.0			Normally OFF
							27.0		
							3229.2		Total (kW)
							3.2		Total (MW)

DUMPS SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	CHILLED WATER SYSTEM								
									From Main Linac Water 285.0 Value Used for Scaling
	Chilled Water Pumps								
	Percentage							0.24	24%
	Chilled Water Pumps	A	1		68.39	68.4			Values Determined by Multiplier From Shaft 7
							68.4		
	Chiller								
	Chiller	Shaft 1.0 Bldg	1		215.0	215.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 1.0 Bldg	0		108.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							215.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 1.0 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.0 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 1.0 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 1.0 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.0 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.0 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 1.0 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 1.0 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	Chilled Water Pumps								
	Percentage							0.24	24%
	Chilled Water Pumps	B	1		68.39	68.4			Values Determined by Multiplier From Shaft 7
							68.4		
	Chiller								
	Chiller	Shaft 1.1 Bldg	1		215.0	215.0		Operating	Values Determined by Multiplier From Shaft 7
	Chiller	Shaft 1.1 Bldg	0		108.0	0.0		Spare	Values Determined by Multiplier From Shaft 7
							215.0		
	Cooling Towers								
	Cooling Tower Fan	Shaft 1.1 Bldg	2	30.0	0.746	44.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.1 Bldg	2	15.0	0.746	22.4		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 1.1 Bldg	2	7.5	0.746	11.2		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 1.1 Bldg	2		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.1 Bldg	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	Shaft 1.1 Bldg	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	Shaft 1.1 Bldg	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	Shaft 1.1 Bldg	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							78.3		
	SUBTOTAL CHILLED WATER (kW)					723.4	723.4		

DUMPS SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	PROCESS WATER SYSTEM 20Deg Delta								
	Process Water Pumps							459.5	From Main Linac Water Value Used for Scaling
	Percentage							1.58	158%
	Process Water Pumps	A	1		726.07	726.1			Values Determined by Multiplier From Shaft 7
							726.1		
	Cooling Towers								
	Cooling Tower Fan	IR1	20	30.0	0.746	447.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR1	20	15.0	0.746	223.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	IR1	20	7.5	0.746	111.9		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	IR1	20		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR1	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR1	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	IR1	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	IR1	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							783.3		
	Percentage							1.58	158%
	Process Water Pumps	B	1		726.07	726.1			Values Determined by Multiplier From Shaft 7
							726.1		
	Cooling Towers								
	Cooling Tower Fan	IR2	20	30.0	0.746	447.6		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR2	20	15.0	0.746	223.8		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	IR2	20	7.5	0.746	111.9		Operating	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	IR2	20		21.0	0.0		Standby - Winter Only	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR2	1	30.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Fan	IR2	1	15.0	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Spray Pump	IR2	1	7.5	0.746	0.0		Standby	Values Determined by Multiplier From Shaft 7
	Cooling Tower Immersion Htr	IR2	1		21.0	0.0		Standby	Values Determined by Multiplier From Shaft 7
							783.3		
	SUBTOTAL PROCESSED WATER (kW)					3018.7	3018.7		
						3742.2	3742.2		
						3.7	3.7		

DUMPS EMERGENCY

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting	Beam Tunnel	25		0.05	1.3			
	Emer Lighting	Service Tunnel	25		0.05	1.3			
	Emer Lighting	Crossover	5		0.05	0.3			
	Exit Signs						2.8		
	FA System								
	Paging System								
	Exhaust & Supply Fans								
	Vent Fan-Supply	Shaft 1	3	15.0	0.746	33.6			LHammond Email 6-29-06
	Dehumidifier-Surface	Shaft 1	3		350.0	1050.0			LHammond Email 6-29-06
	Vent Fan-Supply	Shaft 1.1	3	15.0	0.746	33.6			LHammond Email 6-29-06
	Dehumidifier-Surface	Shaft 1.1	3		350.0	1050.0			LHammond Email 6-29-06
							2167.1		
	Sump Pumps								
	Sump Pump	Shaft 1	1	40.0	0.746	29.8		Operating	LHammond Email 6-29-06
	Sump Pump	Shaft 1	0	40.0	0.746	0.0		Stand By	LHammond Email 6-29-06
	Sump Pump	Shaft 1	0	40.0	0.746	0.0		Stand By	LHammond Email 6-29-06
							29.8		
						2199.7	2199.7	Total (kW)	
							2.2	Total (MW)	

BEAM DELIVERY SYSTEM CONVENTIONAL

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	FCU		0	1.5	0.746	0.0			2 FCU every 108m; 1-1.5HP Motor
							0.0		
	Lighting	Beam Tunnel	250		0.05	12.5		Normally OFF	WAG
	Lighting	Service Tunnel	250		0.05	12.5			WAG
	Lighting	Crossover	40		0.05	2.0		Assume 15% for Cross-Overs	WAG
	Receptacles	Beam Tunnel	0		2.28	0.0		1-120V, 20A duplex; 3-120V, 20A, twist-lock; 2-120V, 20A, duplex & 2-208V, 20A	Normally OFF
	Receptacles	Service Tunnel	0		3.12	0.0		4-120V, 20A, duplex & 4-208V, 20A	Normally OFF
	Welding Recept	Service Tunnel	1		40.0	0.0			Normally OFF
							27.0		
							27.0		Total (kW)
							0.0		Total (MW)

BEAM DELIVERY SYSTEM MAGNETS

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	NC Magnets		1		17300.0	17300.0			PBellomo EMail 8-27-06
							17300.0	Total (kW)	
							17.3	Total (MW)	

DRAFT

BEAM DELIVERY SYSTEM CRYO

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Cryo	Shaft 1	1		120.0	120.0		Installed Power 180kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Cryo	Shaft 1.1	1		120.0	120.0		Installed Power 180kW	TPeterson EMail 8-3-06 TPeterson EMail 8-1-06
	Note						240.0		Total BDS Cryo (kW)
	E-Mail 3-31-06 T Peterson						0.2		Total BDS Cyro (MW)
	T. Peterson 8-1-06								
	TPeterson Email 8-3-06								

BEAM DELIVERY SYSTEM SURFACE WATER

Rev	Service	Location	QTY	HP	KW (ea)	Load ea (kW)	Load Total (kW)	Notes	Reference
	Included Under Main Linac per EHeudem E Mails 8-28-06								
							0.0	Total (kW)	
							0.0	Total (MW)	

DRAFT

BEAM DELIVERY SYSTEM EMERGENCY

Rev	Service	Location	QTY		KW (ea)	Load ea (kW)	Load Total	Notes	Reference
	Emer Lighting	Beam Tunnel	25		0.05	1.3			
	Emer Lighting	Service Tunnel	25		0.05	1.3			
	Emer Lighting	Crossover	5		0.05	0.3			
	Exit Signs						2.8		
	FA System								
	Paging System						0.0		
	Exhaust & Supply Fans								
	Vent Fan-Exhaust	Shaft 3	8	15.0	0.746	89.5			LHammond Email 6-29-06
	Vent Fan-Exhaust	Shaft 2	8	15.0	0.746	89.5			LHammond Email 6-29-06
							179.0		
	Sump Pumps								
	Sump Pump	Shaft 3	1	75.0	0.746	56.0		Operating	LHammond Email 6-29-06
	Sump Pump	Shaft 3	0	75.0	0.746	0.0		Stand By	LHammond Email 6-29-06
	Sump Pump	Shaft 3	0	75.0	0.746	0.0		Stand By	LHammond Email 6-29-06
	Sump Pump	Shaft 2	1	75.0	0.746	56.0		Operating	LHammond Email 6-29-06
	Sump Pump	Shaft 2	0	75.0	0.746	0.0		Stand By	LHammond Email 6-29-06
	Sump Pump	Shaft 2	0	75.0	0.746	0.0		Stand By	LHammond Email 6-29-06
							111.9		
						293.7	293.7	Total (kW)	
							0.3	Total (MW)	