PEP-II Minimal Maintenance State Upkeep

Stan Ecklund
(J. Seeman, S. DeBarger, D. Kharakh, M. Zurawel)

Requirements

- Preserve PEP-II Components for potential new use.
  - Control environment
    - Fire
    - Water
    - Physical damage from earthquake, etc.
    - Theft
    - Unauthorized use
- Store Components in a Safe manner
  - Control access to any residual radiation
  - Ensure Stored Energy Hazards are controlled
  - Monitor state of components
  - Maintain a clean environment

Cost Effective Efficiency

- Storage in place in existing tunnel is most cost effective.
  - Avoids finding substantial storage space
  - Avoids handling components twice.
- Transition to Minimal Maintenance State to be done when manpower available
  - After down maintenance period starting October 2008
  - Less conflict with LCLS construction activities.
  - Less impact on running program.
  - Saves overhead of new hires and training.
- Can Control access to tunnel using existing PPS Gates
  - Requires maintenance
  - Operator controlled

Scope

- Tunnel of 2.2 km circumference
- Injection lines from LINAC
- Seven interaction Halls
- Power Supply/Service buildings


641
640


645
645

Power Supply Building 624

Components

Number of:	HER	LER
Quadrupole Magnets	302	344
Bend Magnets	204	227
Dipole Correctors	285	312
Other Magnets	124	56
Fast Feed Back kickers	3	3
Beam Position Monitors	291	322
Loss Monitors	75	73
Other Diagnostics	12	
RF Cavities 476 MHz	28	8
RF Stations (DC PS, Klystron, Control)	11	4

PEP-II Control System

Component	Number
Micro Computers	11
CAMAC Crates	70
CAMAC Modules	~ 1200
Gateways	
OIC Computers	~ 20
Network Switches	~ 22
Machine Protection System (MPS)	

Detailed Component Lists Online

- Link to V:\AD\PEP_DND
- HER list
  - V:\AD\PEP_DND\KH Nomencl. Folder\HERN10.2.SORT.Qty.xls
- LER list
  - V:\AD\PEP_DND\KH Nomencl. Folder\LERN10.7.SORT.Qty.xls


DANGER
CAUTION
RADIATION AREA


24 VOLTS
NO HIGH VOLTAGE INSIDE THIS BOX
24 VOLTS
NO HIGH VOLTAGE INSIDE THIS BOX
CAUTION

Maintaining Effort

- Tunnel mechanical integrity
  - One technician, ½ supervisor
- Tunnel water removal
  - Two technicians, ½ supervisor
- Tunnel lighting (for safety)
  - One technician, ½ supervisor
- Component removal for other programs
  - Must be controlled by knowledgeable people so to not damage equipment or adversely affect safety of area.
  - Two technicians, one mechanical engineer, one electrical engineer for 2 years, (1/2 that after 2 years)

Cost Estimate Details FY09

PEP-II Ramp Down Plan Details				J. Seeman	5-Aug-07		
Year	Role	Task	Group	FTE-yr	Cost for labor	M&S or power	Total Cost
						(k$)	(k$)
PEP-II accelerator work:							
FY09	Area Manager	Coordinate maintenance and removal	ASD	1	150	25	175
FY09	Area Physicist	Coordinate removal and dispersal	ASD	0.5	75	10	85
FY09	Documentation	Document PEP-II components	ASD	0.8	120	10	130
FY09	Documentation Supervisor	Document PEP-II components	ASD	0.4	60	5	65
FY09	Electrical technician	Secure electrical hazards	PCD	0.5	75	30	105
FY09	Electrical engineer	Secure electrical hazards	PCD	0.25	38	10	48
FY09	Mechanical technician	Secure mechanical hazards	MFD	0.3	45	50	95
FY09	Mechanical engineer	Secure mechanical hazards	ASD	0.2	30	10	40
FY09	Mechanical technician	Drain and dry magnet coils	MFD	2	300	50	350
FY09	Mechanical supervisor	Drain and dry magnet coils	MFD	1	150	10	160
FY09	Mechanical technician	Drain and dry H2O for vacuum chambers	MFD	1	150	65	215
FY09	Mechanical supervisor	Drain and dry H2O for vacuum chambers	MFD	0.5	75	10	85
FY09	Vacuum technician	Vent the vacuum system	MFD	0.4	60	50	110
FY09	Vacuum supervisor	Vent the vacuum system	MFD	0.2	30	10	40
FY09	RF technician	Secure the RF system	Klys	1.2	180	60	240
Tunnel facility maintenance and security:							
FY09	Mechanical technician	Maintain tunnel fire-protection systems	CEF	0.25	38	10	48
FY09	Mechanical technician	Maintain tunnel mechanical integrity	CEF	0.75	113	40	153
FY09	Mechanical technician	Maintain tunnel water drain systems	CEF	1	150	60	210
FY09	Mechanical supervisor	Maintain tunnel mechanical systems	CEF	1	150	10	160
FY09	Electrical technician	Maintain tunnel lighting systems	CEF	0.4	60	20	80
FY09	Electrical supervisor	Maintain tunnel lighting systems	CEF	0.2	30	10	40
FY09	Security Officer	Maintain tunnel safety walkthrus	ASD	0.4	60	0	60
FY09	Security Officer Supervsr	Maintain tunnel safety walkthrus	ASD	0.2	30	0	30
FY09	Crane maintenance/checks	Secure and certify cranes in IR halls	CSE	0.3	45	10	55
FY09	Controls maintenance	Keep control system reading safety systems	CSE	0.8	120	30	150
FY09	Controls maintenance sprv	Keep control system reading safety systems	CSE	0.5	75	5	80
FY09	Electrical power	(<Power> = 2.1 MW) (Full OPS was ~22 MW)	Site			950	950
			Totals =	16.05	2409	1550	3959

Cost Estimate – continued FY10

PEP-II Ramp Down Plan Details				J. Seeman	5-Aug-07		
Year	Role	Task	Group	FTE-yr	Cost for labor	M&S or power (k$)	Total Cost (k$)
PEP-II accelerator work:							
FY10	Area Manager	Coordinate maintenance and removal	ASD	0.5	78	40	118
FY10	Area Physicist	Coordinate removal and dispersal	ASD	0.25	39	20	59
FY10	Documentation	Document PEP-II components	ASD	0.4	62	8	70
FY10	Documentation Supervisor	Document PEP-II components	ASD	0.2	31	4	35
FY10	Mechanical technician	Secure mechanical hazards	MFD	0.2	31	10	41
FY10	Mechanical engineer	Secure mechanical hazards	ASD	0.1	16	5	21
FY10	Mechanical technician	Drain and dry magnet coils	MFD	0.2	31	15	46
FY10	Mechanical supervisor	Drain and dry magnet coils	MFD	0.1	16	5	21
FY10	RF technician	Maintain RF system	Klys	0.6	94	50	144
Tunnel facility maintenance and security:							
FY10	Mechanical technician	Maintain tunnel fire-protection systems	CEF	0.25	38	10	48
FY10	Mechanical technician	Maintain tunnel mechanical integrity	CEF	1	150	40	190
FY10	Mechanical technician	Maintain tunnel water drain systems	CEF	1	150	50	200
FY10	Mechanical supervisor	Maintain tunnel mechanical systems	CEF	0.8	125	10	135
FY10	Electrical technician	Maintain tunnel lighting systems	CEF	0.4	60	20	80
FY10	Electrical supervisor	Maintain tunnel lighting systems	CEF	0.2	30	10	40
FY10	Security Officer	Maintain tunnel safety walkthrus	ASD	0.2	60	0	60
FY10	Security Officer Supervsr	Maintain tunnel safety walkthrus	ASD	0.1	30	0	30
FY10	Crane maintenance/checks	Secure and certify cranes in IR halls	CSE	0.3	45	10	55
FY10	Controls maintenance	Keep control system reading safety systems	CSE	0.6	94	25	119
FY10	Controls maintenance sprv	Keep control system reading safety systems	CSE	0.3	47	5	52
FY10	Electrical power	(<Power> = 1.5 MW) (Full OPS was ~22 MW)	Site			650	650
			Totals =	7.7	1227	987	2214

Cost Estimate – continued FY11

PEP-II Ramp Down Plan Details				J. Seeman	5-Aug-07		
Year	Role	Task	Group	FTE-yr	Cost for labor	M&S or power (k$)	Total Cost (k$)
PEP-II accelerator work:							
FY11	Area Manager	Coordinate maintenance and removal	ASD	0.2	32	30	62
FY11	Area Physicist	Coordinate removal and dispersal	ASD	0.1	16	5	21
FY11	RF technician	Maintain RF system	Klys	0.1	16	15	31
FY11	Documentation	Document PEP-II components	ASD	0.2	32	5	37
FY11	Documentation Supervisor	Document PEP-II components	ASD	0.1	16	0	16
Tunnel facility maintenance and security:							
FY11	Mechanical technician	Maintain tunnel fire-protection systems	CEF	0.2	32	10	42
FY11	Mechanical technician	Maintain tunnel mechanical integrity	CEF	0.2	32	25	57
FY11	Mechanical technician	Maintain tunnel water drain systems	CEF	0.2	32	20	52
FY11	Mechanical supervisor	Maintain tunnel mechanical systems	CEF	0.1	16	5	21
FY11	Electrical technician	Maintain tunnel lighting systems	CEF	0.2	32	15	47
FY11	Electrical supervisor	Maintain tunnel lighting systems	CEF	0.1	16	5	21
FY11	Security Officer	Maintain tunnel safety walkthrus	ASD	0.2	60	0	60
FY11	Security Officer Supervsr	Maintain tunnel safety walkthrus	ASD	0.1	30	0	30
FY11	Crane maintenance/checks	Secure and certify cranes in IR halls	CSE	0.2	32	10	42
FY11	Controls maintenance	Keep control system reading safety systems	CSE	0.2	32	15	47
FY11	Electrical power	(<Power> = 0.8 MW) (Full OPS was ~22 MW)	Site			400	400
			Totals =	2.4	426	560	986

Cost Summary

(K$)	FY09	FY10	FY11
PEP-II Accelerator Work	1943	555	167
Tunnel Facility Maintenance and Security	1066	1009	419
Power	950	650	400
Total	3959	2214	986

Manpower Summary

FTE - Year	FY09	FY10	FY11
PEP-II Accelerator Work	10.25	2.55	0.7
Tunnel Facility Maintenance and Security	5.8	5.15	1.7
Power			
Total FTE - Year	16.05	7.7	2.4

M&S Summary

K$	FY09	FY10	FY11
PEP-II Accelerator Work	405	157	55
Tunnel Facility Maintenance and Security	195	180	105
Power	950	650	400
Total M&S	1550	987	560

extra

		Year			
Category	Data	FY09	FY10	FY11	(blank)
A	Sum of Total	1943	555	167	
	Sum of FTE-yr	10.25	2.55	0.7	
	Sum of M&S or	405	157	55	
M	Sum of Total	1066	1009	419	
	Sum of FTE-yr	5.8	5.15	1.7	
	Sum of M&S or	195	180	105	
(blank)	Sum of Total				7159
	Sum of FTE-yr				26.15
	Sum of M&S or				3097
P	Sum of Total	950	650	400	
	Sum of FTE-yr				
	Sum of M&S or	950	650	400	
Total Sum of Total		3959	2214	986	7159
Total Sum of FTE-yr		16.05	7.7	2.4	26.15
Total Sum of M&S or		1550	987	560	3097