

**Accelerator Beam Charge Breakdown
45 MeV Fast Pulse Linac, Cost/Hour, Dec. 5, 2006**

Microwave system	Cost(\$)	Life (hr)	Cost/hr (\$/hr)
Klystron	200,000	5,000	40.00
Thyratron	20,000	1,000	20.00
Pass Tube and Power Supplies	11,000	1,000	11.00
PFN Capacitors	10,000	1,000	10.00
RF drivers – Pulse Transformers	40,000	8,000	5.00
Magnet power supplies(40)	80,000	10,000	8.00
Accelerator			
Guide	2,500,000	625,000	4.00
Gun (replaceable components)	20,000	105	190.00
Vacuum Pumps	150,000	10,000	15.00
Support Equipment/Supplies			
TV Cameras	2,000	300	7.00
Gas/liquid- N2	300	100	3.00
Gas - SF6	1,500 /bottle	100	15.00
Internal “Utility” Conditioning (details on next page)	na	na	50.00
Personnel			
Accelerator technical support	na	na	97.00
Dosimetry/Health Physics	na	na	25.00
TOTAL			500

**Detailed Internal “Utility” Conditioning Costs
45 MeV Fast Pulse L-band Linac**

ISIS Internal Utility Costs for water, electrical, other fluids, and compressed air/gas conditioning systems	Estimated Component Costs (\$)	Life (run time) (hrs)	Per hour charge
A. Water Conditioning:			
1. Main building circulation system filters	\$600	500hrs	\$1.20
2. Main circulation system pumps routine rebuild	\$1500 (3 pumps)	1000hrs	\$1.50
3. L-band Accelerator chillers	\$9000 (3 chillers)	5000hrs	\$1.80
4. Circ. System Chillers routine maintenance/repair	\$5,000	1000hrs	\$5.00
B. Internal electrical switching, level changing and control conditioning systems:			
1. Main air compressor	\$500	1000	\$.50
2. UPS for vacuum pumps	1,000	1,000	\$1.00
3. UPS for instrumentation	1,000	1,000	\$1.00
4. Voltage conversion systems/ FPL	\$150,000	5,000	\$30.00
5. Isolation transformers for instrumentation	10,000	10,000	\$1.00
C. Other fluid conditioning:			
1. Transformer oil systems	\$2,500	1000	\$2.50
D. Compressed air and gas conditioning systems:			
1. Waveguide flush system	\$500	1000	\$.50
2. Waveguide SF6 systems	\$3,000	1000	\$3.00
TOTAL			\$50.00