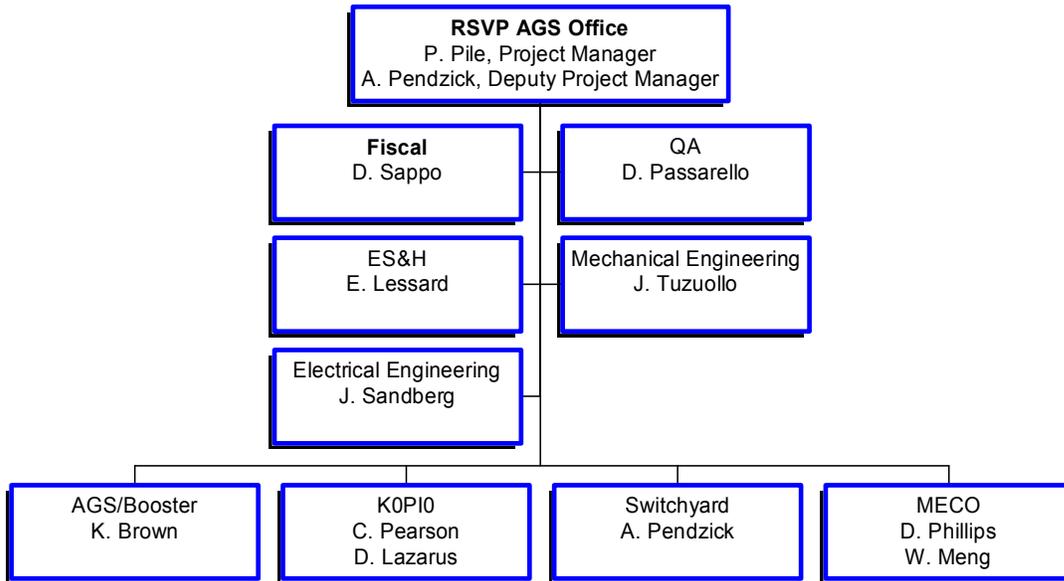


RSVP AGS Infrastructure



RSVP Booster/AGS items Requiring Advanced R&D and Engineering Support

1. Booster C5 Vacuum Chamber

1 mm Physics

1 mm Engineering

Why? Need to define the problem. Changes are required prior to high intensity beam studies.

2. Booster C3 Inflector protection

1 mm Physics

1 mm Engineering

Why? Possible change to vacuum chamber. Effects cost estimate.

3. High Frequency Segmented Wall current monitor in the AGS

1 mm Physics

3 mm Engineering

**Why? Is needed for beam studies and beam development.
Since useful for RHIC/Polarized could have outside support.**

4. New H20 electrostatic septum

1 mm Physics

6 mm Engineering

**Why? Is in the critical path to high intensity for both RSVP
experiments. Failure of septum this spring needs to be understood.**

5. New F10 magnetic septum

1 mm Physics

3 mm Engineering

**Why? Is in the critical path to high intensity for both RSVP
experiments. Completely new design.**

6. Slow Extraction simulations

4 mm Physics

Why? Many unanswered questions that effect designs.

	New targets	\$2,000			\$2,000	40			40			\$4,570	\$6,570	1	2	10	1	4	8	24%	\$1,577	\$8,147
					\$0							\$0	\$0							0%	\$0	\$0
	C011 Plunging SWIC				\$0							\$0	\$0							0%	\$0	\$0
	SWIC Head	\$15,000			\$15,000	40			80			\$6,576	\$21,576	1	2	8	1	2	8	20%	\$4,315	\$25,891
	Motion upgrade	\$5,000			\$5,000	20			40			\$3,288	\$8,288	1	2	4	1	2	4	12%	\$995	\$9,282
	Electronics	\$1,000			\$1,000	80		20	160			\$14,225	\$15,225	1	2	8	1	2	8	20%	\$3,045	\$18,270
	3.3.6.4 Motion Control				\$0							\$0	\$0							0%	\$0	\$0
	Beam Plugs (3) A, B, & C.	\$9,000			\$9,000	80			160			\$13,151	\$22,151	1	2	4	1	2	8	16%	\$3,544	\$25,695
	X & Y Collimator, 4 jaws = 4 axis	\$12,000			\$12,000	80			160			\$13,151	\$25,151							0%	\$0	\$25,151
	3.3.6.5 Current Transformer				\$0							\$0	\$0							0%	\$0	\$0
	CT at C036	\$10,000			\$10,000	80	40	20	160			\$17,649	\$27,649	1	2	4	1	2	4	12%	\$3,318	\$30,967
	Electronics	\$25,000			\$25,000	80			120			\$11,146	\$36,146	1	2	12	1	2	8	24%	\$8,675	\$44,821
	VME	\$4,000			\$4,000							\$0	\$0							0%	\$0	\$0
					\$0							\$0	\$0							0%	\$0	\$0
	3.3.6.6 Secondary Emission Chamber C10 SEC				\$0							\$0	\$0							0%	\$0	\$0
	Plunge capability	\$30,000			\$30,000	80			160			\$13,151	\$43,151	1	2	4	1	2	8	16%	\$6,904	\$50,055
	Device				\$0							\$0	\$0							0%	\$0	\$0
	Electronics	\$5,000			\$5,000	40		20	100			\$8,652	\$13,652	1	2	8	1	2	8	20%	\$2,730	\$16,382
	Vacuum controls	\$10,000			\$10,000	20			40			\$3,288	\$13,288	1	2	4	1	2	8	16%	\$2,126	\$15,414
	Cabling	\$500			\$500				20			\$1,003	\$1,503	1	2	2	1	2	8	14%	\$210	\$1,713
					\$0							\$0	\$0							0%	\$0	\$0
					\$0							\$0	\$0							0%	\$0	\$0
	3.2.5.8 Cable & Racks				\$0							\$0	\$0							0%	\$0	\$0
	Rad-Damaged & old replaced	\$15,000			\$15,000	40			600			\$32,643	\$47,643	1	2	2	1	2	8	14%	\$6,670	\$54,313
	Relocation	\$10,000			\$10,000	40			160	40		\$13,614	\$23,614	1	2	2	1	2	8	14%	\$3,306	\$26,920
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1 Switchyard Security modifications				\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.1 project support				\$0	0	0	0	0			\$0	\$0	2	2	3	1	1	2	10%	\$0	\$0
	1.5.2.1.2 installation supervision				\$0				600			\$30,078	\$30,078	2	2	3	1	1	2	10%	\$3,008	\$33,086
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.1 PLC Systems				\$0							\$0	\$0							0%	\$0	\$0
	Programming	\$0			\$0	320		0	0	0	0	\$20,522	\$20,522	2	2	3	2	2	8	19%	\$3,899	\$24,421
	PLC & Racks	\$17,000			\$17,000	32		40	240	16	0	\$17,442	\$34,442	2	2	3	2	2	4	15%	\$5,166	\$39,608
	I/O modules	\$11,000			\$11,000	16		0	40	0	0	\$3,031	\$14,031	2	2	3	2	2	4	15%	\$2,105	\$16,136
	R/I/O Blocks	\$10,000			\$10,000			0	40	0	0	\$2,005	\$12,005	2	2	3	2	2	4	15%	\$1,801	\$13,806
	UPS and Phoenix connectors	\$4,000			\$4,000			0	40	40	0	\$5,033	\$9,033	2	2	3	2	2	4	15%	\$1,355	\$10,388
	Fiber converters (R/I/O & DH+ comm)	\$7,200			\$7,200	16		0	40	0	0	\$3,031	\$10,231	2	2	3	2	2	4	15%	\$1,535	\$11,766
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.2 Gates (Incl. 3 gates)				\$0							\$0	\$0							0%	\$0	\$0
	Gates	\$0	\$0		\$0	0			0	0		\$0	\$0	1	2	3	2	1	4	11%	\$0	\$0
	Gates Boxes	\$1,800			\$1,800	40		40	240	0		\$16,744	\$16,744	1	2	3	2	1	4	11%	\$198	\$2,001
	Limit switches (10)	\$600			\$600			0	24	0		\$1,203	\$1,803	1	2	3	2	1	4	11%	\$159	\$1,602
	Electric strikes (2)	\$240			\$240			0	24	0		\$1,203	\$1,443	1	2	3	2	1	4	11%	\$321	\$3,239
	Card Readers (2)	\$400	\$0		\$400	8		0	40	0	0	\$2,518	\$2,918	1	2	3	2	1	4	11%	\$1,824	\$15,858
	Key Tree & Iris Scanner	\$9,000			\$9,000			0	40	40		\$5,033		1	2	3	2	2	4	13%	\$1,824	\$15,858
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.3 Cables				\$0				80	40	0	\$7,038								0%	\$0	\$7,038
	Cables 18/c (3000ft)	\$1,500			\$1,500	0			0	0		\$0	\$1,500	0	2	3	2	2	4	11%	\$165	\$1,665
	Cables 12/c (3000ft)	\$1,500			\$1,500	0		0	0	0		\$0	\$1,500	0	2	3	2	1	4	9%	\$135	\$1,635
	Cables 8/c (3000ft)	\$1,350			\$1,350	0			0	0		\$0	\$1,350	0	2	3	2	1	4	9%	\$122	\$1,472
	Cables 4/c (3000ft)	\$1,050			\$1,050	0		0	0	0		\$0	\$1,050	0	2	3	2	1	4	9%	\$95	\$1,145
	Crash cables (1000ft)	\$750	\$0		\$750	0		0	0	0		\$0	\$750	0	2	3	2	1	4	9%	\$68	\$818
	DH+ Comm cables (1000ft)	\$450	\$0		\$450	0		0	0	0		\$0	\$450	0	2	3	2	1	4	9%	\$41	\$491
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.4 CATV				\$0							\$0	\$0							0%	\$0	\$0
	Bobcat switch 16*2 mux (2)	\$1,200			\$1,200	40		24	80	0		\$7,864	\$9,064	2	2	3	2	2	4	15%	\$1,360	\$10,424
	Lee Data 1*1 Fiber Optics Transmitter	\$500			\$500				24	0		\$1,203	\$1,703	2	2	3	2	2	4	15%	\$255	\$1,959
	Lee Data 1*1 Fiber Optics Receiver (\$500			\$500				24	0		\$1,203	\$1,703	2	2	3	2	2	4	15%	\$255	\$1,959
	Digital Cameras (6)	\$1,800	\$0		\$1,800				40	0		\$2,005	\$3,805	2	2	3	2	2	4	15%	\$571	\$4,376
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.5 Chipmunks				\$0							\$0	\$0							0%	\$0	\$0
	Chipmunks (0 units)	\$0			\$0				0	0		\$0	\$0	1	2	3	2	2	4	13%	\$0	\$0
	VME SIS Scaler board	\$0			\$0				0	0		\$0	\$0	1	2	3	2	2	4	13%	\$0	\$0
	Weather proof enclosure	\$0			\$0				0	0		\$0	\$0	1	2	3	2	2	4	13%	\$0	\$0
	Coaxial cables (1000 ft)	\$0	\$0		\$0				0	0		\$0	\$0	1	2	3	2	2	4	13%	\$0	\$0
					\$0							\$0	\$0							0%	\$0	\$0
	1.5.2.1.6 Crash, Sweep & Alarms				\$0							\$0	\$0							0%	\$0	\$0
	Check station boxes	\$300			\$300	80		40	80	0		\$11,288	\$11,588	1	2	3	2	2	4	13%	\$1,506	\$13,095
	Crash Actuators	\$500			\$500				80	0		\$4,010	\$4,510	1	2	3	2	2	4	13%	\$586	\$5,097
	Crash Stations and Alarms	\$1,500			\$1,500				160	0		\$8,021	\$9,521	1	2	3	2	2	4	13%	\$1,238	\$10,759
					\$0							\$0	\$0							0%	\$0	\$0
					\$0							\$0	\$0							0%	\$0	\$0
					\$0							\$0	\$0							0%	\$0	\$0
	Labor Hours					3700	610	1540	26352	5160	2190			</								

2.2.6.2	D1 sweeper	\$12,000	\$99,225	\$111,225	40	120	680			\$43,096	\$154,321	6	2	4	4	2	2	26%	\$40,124	\$194,445	
	Hookup	\$4,000		\$4,000	8		272	112		\$22,627	\$26,627	2	2	3	2	2	4	15%	\$3,994	\$30,621	
2.2.6.3	D2 sweeper	\$7,000	\$202,250	\$209,250	40	120	160			\$17,029	\$226,279	6	2	4	4	2	2	26%	\$58,832	\$285,111	
	Hookup	\$4,000		\$4,000	8		272	112		\$22,627	\$26,627	2	2	3	2	2	4	15%	\$3,994	\$30,621	
2.2.6.4	D3 sweeper	\$7,000	\$471,500	\$478,500	40	120				\$9,008	\$487,508	6	2	4	4	2	2	26%	\$126,752	\$614,260	
	Hookup	\$4,000		\$4,000	8		272	112		\$22,627	\$26,627	2	2	3	2	2	4	15%	\$3,994	\$30,621	
2.2.6.4	Collimator			\$0	160	320				\$27,442	\$27,442	6	2	4	4	2	2	26%	\$7,135	\$34,576	
	Vacuum box		\$40,000	\$40,000						\$0	\$40,000	6	2	4	4	2	2	26%	\$10,400	\$50,400	
	Heavy met liner		\$76,000	\$76,000						\$0	\$76,000	6	2	4	4	2	2	26%	\$19,760	\$95,760	
	Steel shielding		\$650,000	\$650,000						\$0	\$650,000	6	2	4	4	2	2	26%	\$169,000	\$819,000	
	Installation			\$0						\$0	\$0	6	2	4	4	2	2	26%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
2.2.7.	D4 sweeper	\$7,000	\$338,750	\$345,750	40	120				\$9,008	\$354,758	6	2	4	4	2	2	26%	\$92,237	\$446,995	
	Installation			\$0						\$0	\$0							0%	\$0	\$0	
	Hookup			\$0						\$0	\$0							0%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
2.2.8.	Power supplies			\$0						\$0	\$0							0%	\$0	\$0	
	Modify PSs for new controls (6)	\$45,000		\$45,000	80	48	3240			\$170,129	\$215,129	4	4	4	4	2	8	36%	\$77,446	\$292,575	
				\$0						\$0	\$0							0%	\$0	\$0	
2.2.9.	Electrical modifications			\$0						\$0	\$0							0%	\$0	\$0	
	Modify Royals (4)		\$60,000	\$60,000						\$0	\$60,000	4	4	4	4	2	8	36%	\$21,600	\$81,600	
				\$0						\$0	\$0							0%	\$0	\$0	
2.2.10.	Experimental area			\$0						\$0	\$0							0%	\$0	\$0	
	Detector pit		\$266,000	\$266,000						\$0	\$266,000	4	4	4	4	2	8	36%	\$95,760	\$361,760	
	shielding			\$0						\$0	\$0							0%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
	power and tray			\$0						\$0	\$0							0%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
	counting house			\$0						\$0	\$0							0%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
	Fast electronics area			\$0						\$0	\$0							0%	\$0	\$0	
				\$0						\$0	\$0							0%	\$0	\$0	
	Labor Hours				8272	6070	4558	26986	8010	310									0%		
	FTE				4.7	3.5	2.6	15.4	4.6	0.2									0%		
	TOTALS - DIRECT	\$877,754	\$2,416,725	\$0	\$834,500	\$530,483	\$519,653	\$244,719	\$1,352,808	\$606,357	\$27,807	\$3,281,827	\$6,553,435					23%	\$1,506,343	\$8,064,105	
				\$0							\$0								0%	\$0	\$0
	indirect %	24.98%	12.63%			40.73%	40.73%	40.73%	40.73%	12.35%	12.35%								0.00%	0.00%	
				\$0							\$0								0%	\$0	\$0
	TOTAL	\$ 1,096,997	\$ 2,721,903	\$ 3,818,900	\$ 746,553	\$731,311	\$344,395	\$ 1,903,817	\$ 681,242	\$ 31,241	\$ 4,438,560	\$ 8,257,460						23%	\$1,898,022	\$10,155,482	

RSVP - MECO with instrumentatiuon and security included 8/5/04

6/23/2004

Labor Rates

\$64.13 \$85.61 \$53.69 \$50.13 \$75.70 \$89.70

WBS Number	Description	Materials			Total Mat'l's	Labor Hours						Total Labor Cost	Total w/o Cont	Contingency Risk Factors							Total w/ Cont			
		<\$25000	>\$25000	>\$600000		Eng'r	Physicist	Design	Tech	DTS	Shops			Tech	WF	Design	Cost	WF	Sched	Cont		Cont \$		
	Project Support				\$0							\$0	\$0									0%	\$0	\$0
	Construction Supervision				\$0						800	\$40,104	\$40,104	1	2	10	2	1	2			16%	\$6,417	\$46,521
	Engr & Design Supervision				\$0							\$0	\$0									0%	\$0	\$0
	Physicist Supervision				\$0							\$0	\$0									0%	\$0	\$0
	Design				\$0							\$0	\$0									0%	\$0	\$0
	Lambertson Magnets				\$0							\$0	\$0									0%	\$0	\$0
	Thin Lambertson	\$1,000			\$1,000		20	16	40		160	\$18,226	\$19,226	1	2	10	4	1	4			20%	\$3,845	\$23,071
	Thick lambertson	\$6,000			\$6,000		20	40	120		580	\$79,739	\$85,739	1	2	12	4	1	4			22%	\$18,863	\$104,601
	Equipment Removal				\$0							\$0	\$0									0%	\$0	\$0
	A-Line (AQ7 to A-Target)				\$0						192	\$16,287	\$16,287	1	2	8	4	1	4			18%	\$2,932	\$19,219
	A1 Line				\$0						480	\$43,442	\$43,442	1	2	8	4	1	4			18%	\$7,819	\$51,261
	A2 Line				\$0						64	\$19,560	\$19,560	1	2	8	4	1	4			18%	\$3,521	\$23,080
	A3 Line				\$0						496	\$44,244	\$44,244	1	2	8	4	1	4			18%	\$7,964	\$52,208
	Rad material Disposal		\$48,000		\$48,000						800	\$40,104	\$88,104	1	2	8	4	1	2			16%	\$14,097	\$102,201
	Power Supplies				\$0							\$0	\$0									0%	\$0	\$0
	AC Power Distribution		\$90,000		\$90,000							\$12,718	\$102,718	2	2	10	4	2	4			26%	\$26,707	\$129,424
	PSI Control Upgrades	\$27,000	\$81,000		\$108,000						4000	\$207,787	\$315,787	3	2	10	4	2	4			28%	\$88,420	\$404,208
	Refurbish Power Supplies				\$0							\$0	\$0									0%	\$0	\$0
	PS Installation & Hook-up	\$15,000	\$26,000		\$41,000						512	\$118,929	\$159,929	1	2	10	4	1	4			20%	\$31,986	\$191,915
	Magnet Monitor System		\$15,200		\$15,200		48	80				\$32,385	\$47,585	1	2	10	4	1	4			20%	\$9,517	\$57,102
	Run & Test Power Supplies				\$0						560	\$28,073	\$38,073	1	2	10	4	1	4			20%	\$5,615	\$33,687
	Magnets				\$0							\$0	\$0									0%	\$0	\$0
	Refurbish Magnets	\$18,000			\$18,000						3384	\$213,106	\$231,106	1	2	10	4	1	4			20%	\$46,221	\$277,328
	Magnet Installation				\$0						720	\$57,895	\$78,895	1	2	10	4	1	4			20%	\$11,579	\$69,474
	Magnet DC Hook-up	\$12,000	\$46,000		\$58,000						1600	\$128,656	\$186,656	1	2	10	4	2	4			24%	\$44,797	\$231,453
	Shielding				\$0							\$0	\$0									0%	\$0	\$0
	Build for Beam Tests		\$296,900		\$296,900				600			\$444,126	\$741,026	1	2	10	4	2	4			24%	\$177,846	\$918,872
	Mod for Solenoid Install				\$0							\$122,937	\$122,937	1	2	10	4	2	4			24%	\$29,505	\$152,442
	Seismic Anchoring	\$20,000			\$20,000						800	\$60,560	\$80,560	2	2	10	10	2	2			36%	\$29,002	\$109,562
	Seal Floor	\$20,000			\$20,000							\$0	\$20,000	4	2	10	10	2	4			42%	\$8,400	\$28,400
	Electric & Tray	\$10,000	\$10,000		\$20,000							\$60,560	\$80,560	1	2	10	4	2	4			24%	\$19,334	\$99,894
	Cooling Water	\$3,000			\$3,000						240	\$12,031	\$15,031	1	2	10	4	2	4			24%	\$3,607	\$18,639
	Vacuum	100790	45000		\$145,790		878		366		1464	\$163,699	\$309,489	2	2	8	4	2	4			24%	\$74,277	\$383,766
	Instrumentation				\$0							\$0	\$0									0%	\$0	\$0
	project support				\$0		240	120	80			\$29,960	\$29,960									0%	\$0	\$29,960
	installation supervision				\$0							\$22,057	\$22,057									0%	\$0	\$22,057
	A Transport Devices				\$0							\$0	\$0									0%	\$0	\$0
	SWIC's (4 locations)				\$0		240	40			400	\$38,868	\$38,868									0%	\$0	\$38,868
	Plunging Vac SWIC (32x32) (4" pipe)	120000			\$120,000							\$0	\$120,000	3	2	9	4	2	8			31%	\$37,200	\$157,200
	SWIC Electronics (32x32)	90000			\$90,000							\$0	\$90,000	1	2	4	1	2	8			16%	\$14,400	\$104,400
	Servo SWIC (32x32) (Air)	10000			\$10,000							\$0	\$10,000	1	2	4	1	2	8			16%	\$1,600	\$11,600
	Servo electronics	2000			\$2,000							\$0	\$2,000	1	2	6	2	2	8			20%	\$400	\$2,400
	Bias	6000			\$6,000							\$0	\$6,000	1	2	2	1	2	8			14%	\$840	\$6,840
	Cables/connectors	4000			\$4,000							\$0	\$4,000	1	2	2	1	2	8			14%	\$560	\$4,560
	Gas Distribution (Argon-C02)	2000			\$2,000							\$0	\$2,000	1	2	2	1	2	8			14%	\$280	\$2,280
	Current Transformers				\$0							\$0	\$0									0%	\$0	\$0
	Bergoz	70000			\$70,000		240	40			240	\$30,847	\$100,847	1	2	10	4	2	8			28%	\$28,237	\$129,084
	Beam Position Monitors				\$0							\$0	\$0									0%	\$0	\$0
	Includes BPM, cables, electronics	75000			\$75,000		400		120		650	\$68,267	\$143,267	2	2	10	4	2	8			30%	\$42,980	\$186,247
		5000			\$5,000							\$0	\$5,000									0%	\$0	\$5,000
	Loss Monitors (various locations)				\$0							\$0	\$0									0%	\$0	\$0
	Loss Monitors w/ mounts	16000			\$16,000		160				320	\$26,302	\$42,302	1	2	8	1	2	8			20%	\$8,460	\$50,763
	Loss monitor Electronics				\$0							\$0	\$0	1	2	10	4	2	8			28%	\$0	\$0
	HV Bias	6000			\$6,000							\$0	\$6,000	1	2	2	1	2	8			14%	\$840	\$6,840
	RHIC Style VME	15000			\$15,000							\$0	\$15,000	1	2	6	1	2	8			18%	\$2,700	\$17,700
	Cables (Sig and HV)	1600			\$1,600							\$0	\$1,600	1	2	2	1	2	8			14%	\$224	\$1,824
	Interface to machine protect system	5000			\$5,000							\$0	\$5,000	1	2	8	1	2	8			20%	\$1,000	\$6,000
	Target Instrumentation				\$0							\$0	\$0									0%	\$0	\$0
	Pin Diodes				\$0		240		120		480	\$49,484	\$49,484									0%	\$0	\$49,484
	Pin Diodes & Mounts	10000			\$10,000							\$0	\$10,000	1	2	8	1	2	8			20%	\$0	\$0
	Control Chassis & DCps	2000			\$2,000							\$0	\$2,000	1	2	2	1	2	8			14%	\$280	\$2,280
	SIS scalar	1500			\$1,500							\$0	\$1,500	1	2	2	1	2	8			14%	\$210	\$1,710
	Cables & Connectors	1000			\$1,000							\$0	\$1,000	1	2	2	1	2	8			14%	\$140	\$1,140

