SNS Project

Integrated Control Systems

Cost Book

AUGUST 9, 1999

WBS 1.9 INTEGRATED CONTROL SYSTEM
COST ESTIMATE

1.0 SCOPE OF WORK

This book contains the cost estimate for the Integrated Control System (ICS). The subsystems that make up the Integrated Control System are listed in table A. See WBS Descriptor Forms included in Volume II for additional scope information.

Table A – WBS 1.9 Integrated Control System

WBS	Description	Implementation team at:
1.1.9	Global Control System Development	(Collaboration)
1.9.1	ICS Integration	(Collaboration)
1.9.2	Global Systems (ICS network, timing system, equipment protection systems, etc.)	(Collaboration)
1.9.3	Front End Controls	LBNL
1.9.4	Linac Controls	LANL
1.9.5	Ring Controls	BNL
1.9.6	Target Controls	ORNL
1.9.7	Experiment Controls	ANL
1.9.8	Conventional Facilities Interface	ORNL
1.9.9	Personnel Protection System	ORNL

This estimate includes costs for R&D, design, software development, procurement, fabrication, “factory acceptance” testing, installation, on-site testing, project management, and technical support for the Integrated Control System.

2.0 BASIS OF THE ESTIMATE

The costs shown are based on the best data available at the time of the estimate. The bases used include engineering judgement, historical costs, catalog prices, and vendor quotes. The distribution of costs vs. basis is shown in Table 1 below. Summary cost data for all WBS level 4 elements is shown in Table 2 below. (Please see the backup materials in Volume II of the WBS Cost Book for additional information on cost bases). The SNS control system staff is composed of members from each of the collaborating labs. Table A above shows where the implementation teams for each subsystem are located. In general, labor and overhead rates applied to a given item in the cost estimate are based on the actual rates used by the participant executing the activity. (Labor and overhead rate tables are provided as part of the backup in Volume II).
For some of the global tasks under WBS 1.9.2 the team members have not yet been assigned. For these tasks a composite rate has been developed based on assumptions regarding the percent of the work to be performed at each lab. ORNL overhead rates

have been applied to WBS 1.9.2 procurements for which the procuring lab has not yet been assigned.

A variety of methodologies were used to develop the cost estimates for each ICS subsystem. The method used was based primarily on how far the design has progressed for the system being controlled. For systems that are well defined (e.g. the front end), the method used was a detailed, “bottoms up” estimate. For other systems, engineering judgement and historical costs were applied. See Volume II for additional information on methodologies used.

3.0 CONTINGENCY ANALYSIS

In general, a contingency on the order of 30% is recommended for WBS 1.9. This is a typical factor applied to designs in the “post-CDR” phase.
Contingency factors have been applied in the cost estimate database on an item-by-item basis. The contingency factor applied depends on how far the design has progressed and on the basis used for the cost. Items for which the quantity required is firm and a vendor quote is in hand have a lower percentage applied, while items for which the opposite is true will have a higher percentage.
Some risks that influence the WBS 1.9 contingency factors include:

- Management of a collaborative team may be more difficult than anticipated.
- There may be other inefficiencies introduced by being a collaboration, such as additional travel costs.
- So far each lab has administered its WBS 1.9.x project controls effort under its WBS 1.x budget. This has enabled us to minimize the WBS 1.9 project controls budget. This method of doing business could change depending on the future level of effort required to carry out project controls functions for each WBS 1.9.x subsystem.
- The design of the SNS control system is highly dependent on the design data available for the systems being controlled. Most systems are at the “pre-Title I design” stage, so the uncertainty in control system design (and therefore costs) is compounded.

Table 1 - Basis of Cost

(Burdened Costs)

WBS	WBS Name	Engineering Judgement EJ	Prior Historical Costs HC	Vendor Budget Quote VQ	Catalog Price CP	Placed Contracts PC	Actual Cost AC	Contingency Percent	Totals
1.1.9	Global Controls R&D	1,707,600	0	0	0	0	0	0%	1,707,600
1.1.9.1	Support System Implementation	497,176	0	0	0	0	0	0%	497,176
1.1.9.2	Standards & Tools	455,185	0	0	0	0	0	0%	455,185
1.1.9.3	System Requirements	255,592	0	0	0	0	0	0%	255,592
1.1.9.4	Integration & Support	499,647	0	0	0	0	0	0%	499,647
1.9	Integrated Control Systems	33,809,145	8,781,263	776,204	5,400,572	45,720	171,450	30%	48,984,354
1.9.1	ICS Integration	4,158,472	0	0	0	0	0	30%	4,158,472
1.9.1.1	Project Management	4,158,472	0	0	0	0	0	30%	4,158,472
1.9.2	Global Systems	6,728,605	70,794	409,286	1,398,546	0	0	30%	8,607,232
1.9.2.1	ICS Network	769,305	46,015	31,417	1,054,276	0	0	30%	1,901,013
1.9.2.2	Timing System	994,248	18,480	0	21,123	0	0	30%	1,033,851
1.9.2.3	Equipment Protection Systems	1,145,823	6,300	0	33,044	0	0	30%	1,185,167
1.9.2.4	Computing Equipment (C.R. Servers,etc.)	422,976	0	325,777	59,917	0	0	30%	808,670
1.9.2.5	Software (System & Application)	2,540,813	0	0	0	0	0	30%	2,540,813
1.9.2.6	Software Development System	855,440	0	52,093	230,186	0	0	30%	1,137,718
1.9.3	Front End Systems	780,929	0	161,288	0	0	0	25%	942,217
1.9.3.1	Front End Control System Integration	284,937	0	0	0	0	0	27%	284,937
1.9.3.2	Ion Source Controls	85,485	0	32,403	0	0	0	23%	117,888
1.9.3.3	LEBT Controls	0	0	0	0	0	0	0%	0
1.9.3.4	RFQ Controls	88,012	0	41,374	0	0	0	23%	129,386
1.9.3.5	MEBT Controls	167,397	0	51,458	0	0	0	25%	218,855
1.9.3.6	Cooling and Vacuum Controls	155,098	0	36,053	0	0	0	25%	191,151
1.9.4	Linac Control Systems	12,948,858	377,838	0	2,768,747	0	0	30%	16,095,443
1.9.4.1	Linac Control Systems Integration	4,613,668	321,480	0	0	0	0	30%	4,935,148
1.9.4.2	DTL Control Systems	32,105	347	0	16,832	0	0	30%	49,284
1.9.4.3	CCDTL Control Systems	136,869	2,348	0	90,097	0	0	30%	229,314
1.9.4.4	CCL Control Systems	1,078,509	19,171	0	549,872	0	0	30%	1,647,551
1.9.4.5	Control Systems for Other Systems	1,391,128	14,116	0	856,370	0	0	30%	2,261,614

Table 1 - Basis of Cost

(Burdened Costs)

WBS	WBS Name	Engineering Judgement EJ	Prior Historical Costs HC	Vendor Budget Quote VQ	Catalog Price CP	Placed Contracts PC	Actual Cost AC	Contingency Percent	Totals
1.9.4.6	Control Sys for Linac RF Power Sys	2,588,029	17,141	0	1,062,842	0	0	30%	3,668,012
1.9.4.7	Standard System Design	3,108,550	3,236	0	192,734	0	0	30%	3,304,520
1.9.5	Ring Control Systems	3,671,830	7,757,753	0	148,209	45,720	171,450	30%	11,794,962
1.9.5.1	Ring Control Systems Integration	464,977	1,991,411	0	148,209	45,720	171,450	27%	2,821,768
1.9.5.2	HEBT Controls	465,679	1,791,388	0	0	0	0	31%	2,257,066
1.9.5.3	Ring Controls	684,821	2,391,775	0	0	0	0	30%	3,076,595
1.9.5.4	RTBT Controls	465,679	1,583,179	0	0	0	0	30%	2,048,858
1.9.5.5	Application Software	1,590,675	0	0	0	0	0	34%	1,590,675
1.9.6	Target Global Controls	1,493,970	0	0	461,724	0	0	30%	1,955,694
1.9.6.1	Target Controls Integrastion	590,161	0	0	150,783	0	0	30%	740,944
1.9.6.2	Target Systems	123,691	0	0	135,620	0	0	30%	259,311
1.9.6.3	Moderator Systems	50,412	0	0	6,567	0	0	30%	56,978
1.9.6.4	Reflector Systems	34,913	0	0	9,940	0	0	30%	44,854
1.9.6.5	Vessel Systems	46,877	0	0	13,254	0	0	30%	60,131
1.9.6.6	Shielding Systems	163,556	0	0	46,389	0	0	30%	209,945
1.9.6.7	Target Utilty Systems	400,033	0	0	86,526	0	0	30%	486,560
1.9.6.8	Remote Handling System Interface	24,030	0	0	3,152	0	0	30%	27,182
1.9.6.9	Beam Dump Systems	60,297	0	0	9,493	0	0	30%	69,790
1.9.7	Control Systems	180,421	0	0	165,791	0	0	10%	346,212
1.9.7.1	Instrument Support Facilities Controls	0	0	0	0	0	0	0%	0
1.9.7.2	System Integration	180,421	0	0	0	0	0	0%	180,421
1.9.7.3	POW3 Controls	0	0	0	19,130	0	0	20%	19,130
1.9.7.4	INEL2 Controls	0	0	0	19,130	0	0	20%	19,130
1.9.7.5	SCD1 Controls	0	0	0	12,753	0	0	20%	12,753
1.9.7.6	POW7 Controls	0	0	0	12,753	0	0	20%	12,753
1.9.7.7	INEL4 Controls	0	0	0	12,753	0	0	20%	12,753
1.9.7.8	INEL1 Controls	0	0	0	19,130	0	0	20%	19,130
1.9.7.9	SANS2 Cotrols	0	0	0	19,130	0	0	20%	19,130

Table 1 - Basis of Cost

(Burdened Costs)

WBS	WBS Name	Engineering Judgement EJ	Prior Historical Costs HC	Vendor Budget Quote VQ	Catalog Price CP	Placed Contracts PC	Actual Cost AC	Contingency Percent	Totals
1.9.7.10	**REF1 Controls**	0	0	0	19,130	0	0	20%	19,130
1.9.7.11	**POW6 Controls**	0	0	0	19,130	0	0	20%	19,130
1.9.7.12	**INEL5 Controls**	0	0	0	12,753	0	0	20%	12,753
1.9.8	**Conventional Facilities Global Controls**	261,009	574,877	15,221	73,138	0	0	30%	924,246
1.9.8.1	**Integration**	110,471	82,053	8,710	29,255	0	0	30%	230,489
1.9.8.2	**Electric Power and Comm Sys I/F**	15,092	66,221	0	4,827	0	0	30%	86,141
1.9.8.3	**HVAC Systems**	45,735	177,825	0	14,628	0	0	30%	238,187
1.9.8.4	**Mechanical & Piping Systems**	45,735	157,374	0	14,628	0	0	30%	217,736
1.9.8.5	**Waste Systems**	30,642	91,405	0	9,801	0	0	30%	131,848
1.9.8.7	**Emergency Response Facility I/F**	13,334	0	6,512	0	0	0	30%	19,845
1.9.9	**Personnel Protection**	3,585,050	0	190,408	384,416	0	0	30%	4,159,874
1.9.9.1	**Accelerator Personnel Protection**	1,862,909	0	17,316	156,291	0	0	30%	2,036,516
1.9.9.2	**Target Facility Personnel Protection**	1,247,890	0	0	228,125	0	0	30%	1,476,015
1.9.9.3	**Health Physics Instruments and Stack Mont.**	474,250	0	173,093	0	0	0	30%	647,343

Table 2 - Subproject Cost Summary by WBS

WBS	WBS Name	R&D Ops	Materials & Equipment	Labor	ED&I	Constr.	Install.	Project Mgmt	Software Develop.	Unburdened Cost	Burdened Cost
Subproject CO - Controls		1,132,334	11,629,241	1,059,369	9,581,043	0	1,811,347	1,593,225	11,368,090	38,174,649	50,691,954
R&D Costs		1,132,334	196,658	0	0	0	0	0	0	1,328,993	1,707,600
1.1.9	Global Controls R&D	1,132,334	196,658	0	0	0	0	0	0	1,328,993	1,707,600
1.1.9.1	Support System Implementation	342,637	58,235	0	0	0	0	0	0	400,871	497,176
1.1.9.2	Standards & Tools	349,757	0	0	0	0	0	0	0	349,757	455,185
1.1.9.3	System Requirements	194,906	0	0	0	0	0	0	0	194,906	255,592
1.1.9.4	Integration & Support	245,035	138,424	0	0	0	0	0	0	383,458	499,647
1.9	Integrated Control Systems	0	11,432,583	1,059,369	9,581,043	0	1,811,347	1,593,225	11,368,090	36,845,656	48,984,354
1.9.1	ICS Integration	0	229,500	0	2,645,986	0	0	187,950	0	3,063,436	4,158,472
1.9.1.1	Project Management	0	229,500	0	2,645,986	0	0	187,950	0	3,063,436	4,158,472
1.9.2	Global Systems	0	3,105,744	21,395	1,607,486	0	509,265	0	1,719,840	6,963,731	8,607,232
1.9.2.1	ICS Network	0	1,059,104	0	533,595	0	61,402	0	0	1,654,101	1,901,013
1.9.2.2	Timing System	0	287,720	3,214	372,813	0	84,853	0	57,361	805,960	1,033,851
1.9.2.3	Equipment Protection Systems	0	321,720	3,214	423,312	0	71,430	0	116,351	936,026	1,185,167
1.9.2.4	Computing Equipment (C.R. Serve	0	488,350	1,959	171,367	0	36,441	0	15,644	713,761	808,670
1.9.2.5	Software (System & Application)	0	433,000	0	0	0	0	0	1,491,376	1,924,376	2,540,813
1.9.2.6	Software Development System	0	515,850	13,009	106,399	0	255,139	0	39,110	929,507	1,137,718
1.9.3	Front End Systems	0	171,938	0	176,439	0	34,546	85,979	331,315	800,217	942,217
1.9.3.1	Front End Control System Integrati	0	27,000	0	128,968	0	0	85,979	0	241,947	284,937
1.9.3.2	Ion Source Controls	0	29,118	0	6,497	0	4,596	0	60,145	100,356	117,888
1.9.3.3	LEBT Controls	0	0	0	0	0	0	0	0	0	0
1.9.3.4	RFQ Controls	0	37,180	0	13,492	0	9,436	0	50,417	110,526	129,386
1.9.3.5	MEBT Controls	0	46,242	0	16,830	0	11,078	0	111,592	185,741	218,855
1.9.3.6	Cooling and Vacuum Controls	0	32,399	0	10,652	0	9,436	0	109,161	161,648	191,151
1.9.4	Linac Control Systems	0	2,923,410	562,448	1,947,793	0	592,424	1,319,296	3,014,293	10,359,663	16,095,443
1.9.4.1	Linac Control Systems Integration	0	557,000	309,830	0	0	0	1,319,296	823,398	3,009,525	4,935,148
1.9.4.2	DTL Control Systems	0	14,386	1,691	9,907	0	3,495	0	4,561	34,040	49,284
1.9.4.3	CCDTL Control Systems	0	77,002	8,050	49,451	0	18,083	0	9,708	162,294	229,314
1.9.4.4	CCL Control Systems	0	469,940	49,048	405,032	0	170,879	0	56,141	1,151,041	1,647,551

Table 2 - Subproject Cost Summary by WBS

WBS	WBS Name	R&D Ops	Materials & Equipment	Labor	ED&I	Constr.	Install.	Project Mgmt	Software Develop.	Unburdened Cost	Burdened Cost
1.9.4.5	Control Systems for Other System	0	731,940	79,531	368,950	0	75,221	0	304,096	1,559,739	2,261,614
1.9.4.6	Control Sys for Linac RF Power Sy	0	908,412	96,574	865,475	0	305,212	0	318,131	2,493,803	3,668,012
1.9.4.7	Standard System Design	0	164,730	17,723	248,979	0	19,533	0	1,498,258	1,949,222	3,304,520
1.9.5	Ring Control Systems	0	2,353,005	300,931	1,345,804	0	276,745	0	5,014,527	9,291,013	11,794,962
1.9.5.1	Ring Control Systems Integration	0	1,080,424	105,349	36,886	0	0	0	999,205	2,221,864	2,821,768
1.9.5.2	HEBT Controls	0	366,676	56,354	377,149	0	71,624	0	906,464	1,778,267	2,257,066
1.9.5.3	Ring Controls	0	539,229	82,874	554,620	0	133,497	0	1,113,839	2,424,059	3,076,595
1.9.5.4	RTBT Controls	0	366,676	56,354	377,149	0	71,624	0	742,520	1,614,323	2,048,858
1.9.5.5	Application Software	0	0	0	0	0	0	0	1,252,500	1,252,500	1,590,675
1.9.6	Target Global Controls	0	420,131	25,406	634,476	0	80,652	0	503,923	1,664,589	1,955,694
1.9.6.1	Target Controls Integrastion	0	137,200	1,198	465,837	0	24,897	0	0	629,133	740,944
1.9.6.2	Target Systems	0	123,403	4,794	22,518	0	9,386	0	66,045	226,146	259,311
1.9.6.3	Moderator Systems	0	5,975	2,397	8,020	0	3,944	0	27,519	47,854	56,978
1.9.6.4	Reflector Systems	0	9,045	719	8,068	0	1,621	0	18,870	38,323	44,854
1.9.6.5	Vessel Systems	0	12,060	959	11,084	0	2,095	0	25,160	51,358	60,131
1.9.6.6	Shielding Systems	0	42,210	3,356	38,794	0	6,835	0	88,060	179,255	209,945
1.9.6.7	Target Utilty Systems	0	78,732	4,794	63,152	0	26,483	0	237,762	410,922	486,560
1.9.6.8	Remote Handling System Interfac	0	2,868	2,397	3,095	0	1,278	0	13,209	22,846	27,182
1.9.6.9	Beam Dump Systems	0	8,638	4,794	13,908	0	4,113	0	27,299	58,752	69,790
1.9.7	Control Systems	0	146,900	140,800	0	0	0	0	0	287,700	346,212
1.9.7.1	Instrument Support Facilities Cont	0	0	0	0	0	0	0	0	0	0
1.9.7.2	System Integration	0	0	140,800	0	0	0	0	0	140,800	180,421
1.9.7.3	POW3 Controls	0	16,950	0	0	0	0	0	0	16,950	19,130
1.9.7.4	INEL2 Controls	0	16,950	0	0	0	0	0	0	16,950	19,130
1.9.7.5	SCD1 Controls	0	11,300	0	0	0	0	0	0	11,300	12,753
1.9.7.6	POW7 Controls	0	11,300	0	0	0	0	0	0	11,300	12,753
1.9.7.7	INEL4 Controls	0	11,300	0	0	0	0	0	0	11,300	12,753
1.9.7.8	INEL1 Controls	0	16,950	0	0	0	0	0	0	16,950	19,130
1.9.7.9	SANS2 Cotrols	0	16,950	0	0	0	0	0	0	16,950	19,130

Table 2 - Subproject Cost Summary by WBS

WBS	WBS Name	R&D Ops	Materials & Equipment	Labor	ED&I	Constr.	Install.	Project Mgmt	Software Develop.	Unburdened Cost	Burdened Cost
1.9.7.10	REF1 Controls	0	16,950	0	0	0	0	0	0	16,950	19,130
1.9.7.11	POW6 Controls	0	16,950	0	0	0	0	0	0	16,950	19,130
1.9.7.12	INEL5 Controls	0	11,300	0	0	0	0	0	0	11,300	12,753
1.9.8	Conventional Facilities Global Con	0	117,185	4,794	234,869	0	24,174	0	398,898	779,920	924,246
1.9.8.1	Integration	0	63,991	1,198	132,467	0	724	0	503	198,885	230,489
1.9.8.2	Electric Power and Comm Sys I/F	0	5,200	395	10,046	0	2,717	0	53,713	72,071	86,141
1.9.8.3	HVAC Systems	0	15,756	1,198	30,444	0	7,735	0	144,160	199,293	238,187
1.9.8.4	Mechanical & Piping Systems	0	15,756	1,198	30,444	0	7,735	0	127,117	182,251	217,736
1.9.8.5	Waste Systems	0	10,557	803	20,397	0	5,263	0	73,404	110,424	131,848
1.9.8.7	Emergency Response Facility I/F	0	5,925	0	11,070	0	0	0	0	16,995	19,845
1.9.9	Personnel Protection	0	1,964,770	3,595	988,189	0	293,541	0	385,294	3,635,388	4,159,874
1.9.9.1	Accelerator Personnel Protection	0	861,392	3,595	508,411	0	114,850	0	280,186	1,768,434	2,036,516
1.9.9.2	Target Facility Personnel Protectio	0	718,415	0	323,917	0	144,392	0	105,108	1,291,831	1,476,015
1.9.9.3	Health Physics Instruments and St	0	384,963	0	155,861	0	34,299	0	0	575,123	647,343

Cost Estimate Listing

This section provides a listing of all cost estimate items in this subproject. Subtotal costs are provided for each level 3 and 4 WBS elements. The data provided for each cost item is described below.

Work Breakdown Structure (WBS) – The WBS element number applicable to the item.

Item – This is entity for which the costs are to be listed. Examples of items are equipment (pumps, Klystrons, magnets), construction materials (concrete, conduit, piping), portions of systems or subsystems (refrigeration system, cooling water piping, ducting) and (management and physics support, survey and alignment, magnet mapping measurement, drawings, specifications, etc.).

Quantity (Qty) – The quantity of materials and/or equipment used to calculate item cost.

Unit – The unit of measure applied to the quantity (each, lot, yards, cu. ft, $, etc.).

Unit Cost – The unit cost of materials and/or equipment used to calculate unburdened cost.

Labor Hours (Hrs) - The labor hours needed to perform the cost item task listed.

Labor Rate (Rate) - The labor rate for the craft, technician, professional, clerical, or other labor needed to perform the cost item task listed.

Unburdened Cost (UB Cost) – The cost without laboratory overheads, TN State Sales Tax, laboratory local taxes, G&A, etc. This cost is calculated from the quantity and unit costs and/or rates described above, includes FPSC indirects, and for laboratory in-house labor; includes salary and fringe benefits.

Labor Code - A code corresponding to the labor rate to indicate the craft, technician, professional, clerical, or other labor needed to perform the cost item task listed.

Basis of Cost Code – Codes indicating how the cost estimate was determined (such as vendor quote, detailed listing, comparison to other projects, etc.). Requirements for backup material used to support the estimate for the item has been specified for each code.

Resource Code (Res. Code) - A code used for resource loading the project Primavera schedule and indicating the type of resources (materials, equipment, ED&I , construction, installation, etc.) to be used.

Participant Code (Part. Code) - The participant (laboratory, AE, or CM,) providing the cost item.

Acquisition Code (Acq. Code) - A code indicating the procurement planning for the cost item. Item can be fabricated in-house (IH), procured by a laboratory or the CM from a subcontractor (SC), or provided by a CM managed Fixed Price Subcontractor (FPSC).

Funding Type (FT) – Funding type will be Line Item (LI), Operating Expense (EX), or Capital Equipment (CE).

Burdened Cost – Except for escalation, the total cost borne by the project. This is the unburdened cost plus laboratory overheads, FPSC indirects, TN state sales tax, laboratory local taxes, G&A, etc. Where costs are quoted from equipment suppliers or construction contractors, the cost quoted can be used as unburdened cost - no need to separately obtain indirect or overhead costs from suppliers or construction contractors was required.

Tax Code - A code designating how the Tn State Sales and Use Tax (TSS&UT) was calculated for the cost item listed.

Cost Estimate Listing by Subproject

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.1.9	***Global Controls R&D***								1,328,993							1,707,600		
1.1.9.1	***Support System Implementation***								400,871							497,176		
1.1.9.1.1	**S/W development sys. - BNL mat'l**			1.0	lot	14,559			14,559		EJ	SC	MA	BN	EX	16,000	X1	0
1.1.9.1.1	**S/W development sys. - BNL labor**						1528.85	81.16	124,083	BNLRTSM	EJ	IH	RD	BN	EX	159,000	X0	0
1.1.9.1.1	**Software development system - ANL mat'l**			1.0	lot	14,559			14,559		EJ	SC	MA	AN	EX	16,000	X1	0
1.1.9.1.1	**Software development system - LANL labor**						292.231	72.59	21,214	LANLRTSM	EJ	IH	RD	LA	EX	37,125	X0	0
1.1.9.1.1	**S/W development sys. - LBNL labor**						1361.78	104.87	142,805	LBNLRTSM	EJ	IH	RD	LB	EX	171,366	X0	0
1.1.9.1.1	**S/W development sys. - LBNL mat'l**			1.0	lot	14,559			14,559		EJ	SC	MA	LB	EX	16,000	X1	0
1.1.9.1.1	**S/W development sys. - ORNL labor**						631.587	86.35	54,534	ORNLRTSM	EJ	IH	RD	OR	EX	65,685	X0	0
1.1.9.1.1	**S/W development sys. - ORNL mat'l**			1.0	lot	14,559			14,559		EJ	SC	MA	OR	EX	16,000	X1	0
1.1.9.2	***Standards & Tools***								349,757							455,185		
1.1.9.2.1	**Develop standards - ORNL labor**						570.904	86.35	49,295	ORNLRTSM	EJ	IH	RD	OR	EX	59,374	X0	0
1.1.9.2.1	**Develop standards - BNL labor**						1490.38	81.16	120,961	BNLRTSM	EJ	IH	RD	BN	EX	155,000	X0	0
1.1.9.2.1	**Develop standards - LANL labor**						361.004	72.59	26,207	LANLRTSM	EJ	IH	RD	LA	EX	45,862	X0	0
1.1.9.2.1	**Develop standards - LBNL labor**						879.275	104.87	92,207	LBNLRTSM	EJ	IH	RD	LB	EX	110,648	X0	0
1.1.9.2.1	**Develop standards - FY00 labor**						675.489	90.43	61,088	CONRTSM	EJ	IH	RD	CO	EX	84,301	X0	0
1.1.9.3	***System Requirements***								194,906							255,592		
1.1.9.3.1	**Concept design of global systems - ORNL labor**						526.683	86.35	45,476	ORNLRTSM	EJ	IH	RD	OR	EX	54,775	X0	0
1.1.9.3.1	**Concept design of global systems - LBNL labor**						498.029	104.87	52,227	LBNLRTSM	EJ	IH	RD	LB	EX	62,672	X0	0
1.1.9.3.1	**Concept design of global systems - FY00 labor**						627.268	90.43	56,727	CONRTSM	EJ	IH	RD	CO	EX	78,283	X0	0
1.1.9.3.1	**Concept design of global systems - BNL labor**						288.462	81.16	23,412	BNLRTSM	EJ	IH	RD	BN	EX	30,000	X0	0
1.1.9.3.1	**Concept design of global systems - LANL labor**						235.06	72.59	17,064	LANLRTSM	EJ	IH	RD	LA	EX	29,862	X0	0
1.1.9.4	***Integration & Support***								383,458							499,647		
1.1.9.4.1	**Project support - ANL labor**						197.124	90.90	17,919	ANLRTSM	EJ	IH	RD	AN	EX	22,961	X0	0
1.1.9.4.1	**Project support - ANL travel**			1.0	lot	9,852			9,852		EJ	SC	MA	AN	EX	10,000	X0	0
1.1.9.4.1	**Project support - BNL labor**						274.038	81.16	22,241	BNLRTSM	EJ	IH	RD	BN	EX	28,500	X0	0
1.1.9.4.1	**Project support - BNL travel**			1.0	lot	32,020			32,020		EJ	SC	MA	BN	EX	32,500	X0	0
1.1.9.4.1	**Project support - LANL travel**			1.0	lot	34,975			34,975		EJ	SC	MA	LA	EX	35,500	X0	0
1.1.9.4.1	**Project support - LBNL travel**			1.0	lot	32,020			32,020		EJ	SC	MA	LB	EX	32,500	X0	0
1.1.9.4.1	**Project support - ORNL labor**						828.481	86.35	71,535	ORNLRTSM	EJ	IH	RD	OR	EX	86,162	X0	0
1.1.9.4.1	**Project support - ORNL travel**			1.0	lot	29,557			29,557		EJ	SC	MA	OR	EX	30,000	X0	0
1.1.9.4.1	**Project support - LBNL labor**						204.935	104.87	21,491	LBNLRTSM	EJ	IH	RD	LB	EX	25,789	X0	0
1.1.9.4.1	**Project support - LANL labor**						1540.74	72.59	111,849	LANLRTSM	EJ	IH	RD	LA	EX	195,735	X0	0
1.9	***Integrated Control Systems***								36,845,656							48,984,354		
1.9.1	***ICS Integration***								3,063,436							4,158,472		
1.9.1.1	***Project Management***								3,063,436							4,158,472		
1.9.1.1.1	**Conferences, TI & TII**			4.0	conf.	1,500			6,000		EJ	SC	MA	CO	LI	6,090	X0	30
1.9.1.1.1	**Lead Engineer**						3520	62.65	220,528	ORNL_ENG	EJ	IH	T2	OR	LI	265,619	X0	30
1.9.1.1.1	**STL**						3520	76.20	268,224	LANL_MGR	EJ	IH	T2	LA	LI	469,392	X0	30
1.9.1.1.1	**System manager**						1760	84.12	148,051	ORNL_TSM	EJ	IH	T2	OR	LI	178,323	X0	30
1.9.1.1.1	**Database designer**						1760	84.12	148,051	ORNL_TSM	EJ	IH	T2	OR	LI	178,323	X0	30
1.9.1.1.2	**Travel, TI & TII**			48.0	trips	1,500			72,000		EJ	SC	MA	CO	LI	73,080	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.1.1.3	**Deputy STL**						2640	76.20	201,168	LANL_MGR	EJ	IH	T3	CO	LI	352,044	X0	30
1.9.1.1.3	**Database designer**						3080	84.12	259,090	ORNL_TSM	EJ	IH	T3	CO	LI	312,066	X0	30
1.9.1.1.3	**System manager**						6160	84.12	518,179	ORNL_TSM	EJ	IH	T3	CO	LI	624,131	X0	30
1.9.1.1.3	**Conferences, TIII**			7.0	conf.	1,500			10,500		EJ	SC	MA	CO	LI	10,658	X0	30
1.9.1.1.3	**STL**						6160	76.20	469,392	LANL_MGR	EJ	IH	T3	CO	LI	821,436	X0	30
1.9.1.1.3	**Travel, TIII**			84.0	trips	1,500			126,000		EJ	SC	MA	CO	LI	127,890	X0	30
1.9.1.1.3	**Mat'ls Engr & Inspection - engineering**						240	84.12	20,189	ORNL_TSM	EJ	IH	T3	CO	LI	24,317	X0	30
1.9.1.1.3	**Mat'ls Engr & Inspection - technician**						240	29.96	7,190	ORNL_TEC	EJ	IH	T3	CO	LI	8,664	X0	30
1.9.1.1.3	**Lead Engineer**						6160	62.65	385,924	ORNL_ENG	EJ	IH	T3	CO	LI	464,834	X0	30
1.9.1.1.4	**Travel**			4.0	trips	0			0		EJ	SC	MA	CO	LI	0	X0	30
1.9.1.1.4	**Conferences**			2.0	trips	0			0		EJ	SC	MA	CO	LI	0	X0	30
1.9.1.1.5	**QA support**						1000	62.65	62,650	ORNL_ENG	EJ	IH	PM	CO	LI	75,460	X0	30
1.9.1.1.5	**Travel**			10.0	trips	1,500			15,000		EJ	SC	MA	CO	LI	15,225	X0	30
1.9.1.1.5	**Project scheduler/estimator**						2000	62.65	125,300	ORNL_ENG	EJ	IH	PM	CO	LI	150,920	X0	30
1.9.2	***Global Systems***								6,963,731							8,607,232		
1.9.2.1	***ICS Network***								1,654,101							1,901,013		
1.9.2.1.1	**Title I & II Engineering for ICS Network**						1848	84.12	155,454	ORNL_TSM	EJ	IH	T2	OR	LI	187,239	X0	30
1.9.2.1.1	**Travel, for design reviews**			4.0	trips	1,500			6,000		EJ	SC	MA	OR	LI	6,090	X0	30
1.9.2.1.2	**Network management stations, H/W & S/W**			1.0	lot	20,000			20,000		EJ	IH	EQ	OR	LI	21,980	X1	30
1.9.2.1.2	**Ethernet switches, Cisco**			1.0	lot	512,290			512,290		CP	IH	EQ	OR	LI	563,007	X1	30
1.9.2.1.2	**Transceivers, 100BaseT/100BaseF**			161.0	ea.	167			26,858		CP	IH	EQ	OR	LI	29,517	X1	30
1.9.2.1.2	**Terminal servers**			1.0	lot	28,587			28,587		VQ	IH	EQ	OR	LI	31,417	X1	30
1.9.2.1.2	**F.O. modem, for terminal RS-232 connections**			224.0	lot	385			86,240		CP	IH	EQ	OR	LI	94,778	X1	30
1.9.2.1.2	**Hardware racks**			13.0	ea.	785			10,199		CP	IH	EQ	OR	LI	11,208	X1	30
1.9.2.1.2	**Network sniffer**			2.0	ea.	25,000			50,000		EJ	IH	EQ	OR	LI	54,950	X2	30
1.9.2.1.2	**Training class**			1.0	ea.	2,000			2,000		EJ	SC	MA	OR	LI	2,198	X0	30
1.9.2.1.2	**Travel, for training**			1.0	trip	1,500			1,500		EJ	SC	MA	OR	LI	1,523	X0	30
1.9.2.1.2	**Training, engineer attendance**						40	84.12	3,365	ORNL_TSM	EJ	IH	T3	OR	LI	4,053	X0	30
1.9.2.1.2	**Transceiver, AIU to 10baseF, for terminal servers**			11.0	ea.	107			1,177		CP	IH	EQ	OR	LI	1,294	X1	30
1.9.2.1.3	**Title III Engineeering for ICS Network**						560	84.12	47,107	ORNL_TSM	EJ	IH	T3	OR	LI	56,739	X0	30
1.9.2.1.6.1	**Outlet box installation**						60.8	30.61	1,861	IND_EE	HC	FP	IN	CM	LI	1,916	X0	30
1.9.2.1.6.1	**Outlet box**			76.0	ea.	25			1,900		EJ	FP	MA	OR	LI	2,280	X1	30
1.9.2.1.6.1	**F.O. terminations, ST mechanical connector (6/IOC)**			812.0	ea.	11			8,607		CP	FP	MA	OR	LI	10,329	X1	30
1.9.2.1.6.1	**F.O. cable, 4 fibers, 62.5/125u, fan-out style, standard duty,**						119.13	30.61	3,647	IND_EE	HC	FP	IN	CM	LI	3,754	X0	30
1.9.2.1.6.1	**F.O. patch cable, duplex, 10'**			734.0	ea.	150			110,100		CP	FP	MA	OR	LI	132,120	X1	30
1.9.2.1.6.1	**F.O. cable, 12 fibers, 62.5/125u, MIC-style, standard duty,**						244.488	30.61	7,484	IND_EE	HC	FP	IN	CM	LI	7,704	X0	30
1.9.2.1.6.1	**F.O. cable, 12 fibers, 62.5/125u, MIC-style, standard duty,**			14,640.0	ft	1			19,032		CP	FP	MA	OR	LI	22,838	X1	30
1.9.2.1.6.1	**Equipment, for fusion splices**			1.0	ea.	10,000			10,000		EJ	FP	MA	OR	LI	12,000	X1	30
1.9.2.1.6.1	**Rack ass'y & installation**						70	30.61	2,143	IND_EE	HC	FP	IN	CM	LI	2,206	X0	30
1.9.2.1.6.1	**Rack (inc. accessories)**			10.0	ea.	1,500		39.24	15,000		CP	FP	MA	OR	LI	18,000	X1	30
1.9.2.1.6.1	**Test F.O. link**			1,660.0	ea.		276.667	30.61	8,469	IND_EE	EJ	FP	IN	CM	LI	8,718	X0	30
1.9.2.1.6.1	**Fusion splice**						276.667	30.61	8,469	IND_EE	EJ	FP	IN	CM	LI	8,718	X0	30
1.9.2.1.6.1	**Fusion splice**			1,660.0	ea.	1			1,660		HC	FP	MA	OR	LI	1,992	X1	30
1.9.2.1.6.1	**RS-232 patch cable**			356.0	ea.	8			2,848		CP	FP	MA	OR	LI	3,418	X1	30
1.9.2.1.6.1	**Connector module housing, 10', 72-fiber, Siecor FDC-CMH-**			28.0	ea.	292			8,176		CP	FP	MA	OR	LI	9,811	X1	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.2.1.6.1	F.O. cable, 4 fibers, 62.5/125u, fan-out style, standard duty,			10,830.0	ft.	1			7,689		CP	FP	MA	OR	LI	9,227	X1	30
1.9.2.1.6.1	Splice tray, 12 fusion splices, Siecor M67-042			154.0	ea.	25			3,850		CP	FP	MA	OR	LI	4,620	X1	30
1.9.2.1.6.1	Splice module housing, 84-fiber, Siecor FDC-SMH-3			24.0	ea.	200			4,800		CP	FP	MA	OR	LI	5,760	X1	30
1.9.2.1.6.1	F.O. terminations, ST mechanical connector (6/IOC)						270.396	30.61	8,277	IND_EE	HC	FP	IN	CM	LI	8,520	X0	30
1.9.2.1.6.1	Cat 5 patch cable			116.0	ea.	10			1,160		CP	FP	MA	OR	LI	1,392	X1	30
1.9.2.1.6.1	Wall-mountable interconnect center, 12-fiber, with adapter			113.0	ea.	120			13,560		CP	FP	MA	OR	LI	16,272	X1	30
1.9.2.1.6.1	Wall-mountable interconnect center, 12-fiber, with adapter						113	30.61	3,459	IND_EE	HC	FP	IN	CM	LI	3,561	X0	30
1.9.2.1.6.1	Connector module, 6 fiber connectors with pigtails, Siecor			306.0	ea.	292			89,352		CP	FP	MA	OR	LI	107,222	X1	30
1.9.2.1.6.2	Labels, for RS-232 cable			256.0	ea.	0			26		EJ	FP	MA	OR	LI	31	X1	30
1.9.2.1.6.2	RS-232 cable installation						45.6057	30.61	1,396	IND_EE	HC	FP	IN	CM	LI	1,437	X0	30
1.9.2.1.6.2	Cable, RS-232			3,990.0	ft.	0			499		EJ	FP	MA	OR	LI	599	X1	30
1.9.2.1.6.2	Cat 5 cable labels			542.0	ea.	0			54		CP	FP	MA	OR	LI	65	X1	30
1.9.2.1.6.2	Terminate RS-232 cable						64	30.61	1,959	IND_EE	HC	FP	IN	CM	LI	2,017	X0	30
1.9.2.1.6.2	Cat 5 ethernet cable, 4-pair						121.387	30.61	3,716	IND_EE	HC	FP	IN	CM	LI	3,825	X0	30
1.9.2.1.6.2	Patch panel, 48 port, for RS-232 links, 6 conductor, ICC mo			8.0	ea.	250			2,000		CP	FP	MA	OR	LI	2,400	X1	30
1.9.2.1.6.2	Patch panel, CAT 5, 48 port, 8 conductor, ICC model T568A			15.0	ea.	250			3,750		CP	FP	MA	OR	LI	4,500	X1	30
1.9.2.1.6.2	Patch cable, CAT 5			272.0	ea.	8			2,040		CP	FP	MA	OR	LI	2,448	X1	30
1.9.2.1.6.2	Patch cable installation						22.6667	30.61	694	IND_EE	EJ	FP	IN	CM	LI	714	X0	30
1.9.2.1.6.2	Outlet box			191.0	ea.	25			4,775		EJ	FP	MA	OR	LI	5,730	X1	30
1.9.2.1.6.2	Cat 5 ethernet cable, 4-pair			10,620.0	ft.	0			1,328		CP	FP	MA	OR	LI	1,593	X1	30
1.9.2.1.6.2	CAT 5 Patch panel installation						7.5	30.61	230	IND_EE	EJ	FP	IN	CM	LI	236	X0	30
1.9.2.1.6.2	Terminate Cat 5 cable						135.5	30.61	4,148	IND_EE	HC	FP	IN	CM	LI	4,270	X0	30
1.9.2.1.6.2	Patch panel installation						4	30.61	122	IND_EE	EJ	FP	IN	CM	LI	126	X0	30
1.9.2.1.6.2	Patch cable, RS-232			256.0	ea.	8			2,048		CP	FP	MA	OR	LI	2,458	X1	30
1.9.2.1.6.2	Patch cable installation, RS-232						21.3333	30.61	653	IND_EE	EJ	FP	IN	CM	LI	672	X0	30
1.9.2.1.6.2	Outlet box installation						152.8	30.61	4,677	IND_EE	HC	FP	IN	CM	LI	4,815	X0	30
1.9.2.1.7	Initial network checkout / start-up						315	84.12	26,498	ORNL_TSM	EJ	IH	T3	OR	LI	31,916	X0	30
1.9.2.1.8	System testing / commissioning support, engr. (level of eff						2640	84.12	222,077	ORNL_TSM	EJ	IH	T3	OR	LI	267,485	X0	30
1.9.2.1.8	System testing / commissioning support, tech. (level of eff						2640	29.96	79,094	ORNL_TEC	EJ	IH	T3	OR	LI	95,309	X0	30
1.9.2.2	***Timing System***								805,960							1,033,851		
1.9.2.2.1	Title I & II design						1200	65.18	78,219	CONTSM	EJ	IH	T2	CO	LI	108,447	X0	30
1.9.2.2.1	Rack design						20	65.18	1,304	CONTSM	EJ	IH	T2	CO	LI	1,807	X0	30
1.9.2.2.1	Cabling design						200	65.18	13,037	CONTSM	EJ	IH	T2	CO	LI	18,074	X0	30
1.9.2.2.1	Conceptual design						800	65.18	52,146	CONTSM	EJ	IH	T2	CO	LI	72,298	X0	30
1.9.2.2.1	Title I & II design						1200	40.17	48,204	CONTEC	EJ	IH	T2	CO	LI	68,160	X0	30
1.9.2.2.1	Travel, for design I/F			8.0	trip	1,500			12,000		HC	SC	MA	CO	LI	12,180	X0	30
1.9.2.2.1	Travel, for design reviews			6.0	trip	1,500			9,000		EJ	SC	MA	CO	LI	9,135	X0	30
1.9.2.2.2	Master module			2.0	ea.	20,000			40,000		EJ	IH	EQ	CO	LI	43,960	X2	30
1.9.2.2.2	Slave module			100.0	ea.	2,000			200,000		EJ	IH	EQ	CO	LI	219,800	X2	30
1.9.2.2.2	VME crate, incl. processor & utility board			1.0	ea.	10,000			10,000		CP	IH	EQ	CO	LI	10,990	X2	30
1.9.2.2.2	Racks			1.0	ea.	1,500			1,500		EJ	IH	EQ	CO	LI	1,649	X1	30
1.9.2.2.3	Title III engineering						1000	65.18	65,183	CONTSM	EJ	IH	T3	CO	LI	90,372	X0	30
1.9.2.2.4	Software development						880	65.18	57,361	CONTSM	EJ	IH	SW	CO	LI	79,528	X0	30
1.9.2.2.5	Rack fabrication						80	40.17	3,214	CONTEC	EJ	IH	LA	CO	LI	4,544	X0	30
1.9.2.2.6	F.O. terminations, ST mechanical connector			200.0	ea.	11			2,120		CP	FP	MA	CM	LI	2,330	X5	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.2.2.6	**Cabling (Timing Signal Dist)**			10,000.0	ft.	1			7,100		CP	SC	MA	CM	LI	7,803	X5	30
1.9.2.2.6	**Carrier cabling installation**						133.333	30.61	4,081	IND_EE	HC	IH	IN	CM	LI	4,201	X0	30
1.9.2.2.6	**H/W installation**						200	40.17	8,034	CONTEC	EJ	IH	IN	CO	LI	11,360	X0	30
1.9.2.2.6	**F.O. terminations, ST mechanical connector**						66.6	30.61	2,039	IND_EE	HC	FP	IN	CM	LI	2,099	X0	30
1.9.2.2.7	**Checkout & start-up support**						1760	40.17	70,699	CONTEC	EJ	IH	IN	CO	LI	99,969	X0	30
1.9.2.2.7	**Travel, for checkout**			4.0	trips	1,500			6,000		EJ	SC	MA	CM	LI	6,090	X0	30
1.9.2.2.7	**Checkout & start-up support**						1760	65.18	114,721	CONTSM	EJ	IH	T3	OR	LI	159,055	X0	30
1.9.2.3	***Equipment Protection Systems***								936,026							1,185,167		
1.9.2.3.1	**FPS Title I & II design**						1040	65.18	67,790	CONTSM	EJ	IH	T2	CO	LI	93,987	X0	30
1.9.2.3.1	**FPS Travel, for design reviews**			6.0	trip	1,500			9,000		EJ	SC	MA	CO	LI	9,135	X0	30
1.9.2.3.1	**FPS Conceptual design**						320	65.18	20,858	CONTSM	EJ	IH	T2	CO	LI	28,919	X0	30
1.9.2.3.1	**FPS Title I & II design**						1040	40.17	41,777	CONTEC	EJ	IH	T2	CO	LI	59,072	X0	30
1.9.2.3.1	**FPS Carrier cabling design**						200	65.18	13,037	CONTSM	EJ	IH	T2	CO	LI	18,074	X0	30
1.9.2.3.1	**BPS Conceptual design**						320	65.18	20,858	CONTSM	EJ	IH	T2	CO	LI	28,919	X0	30
1.9.2.3.1	**BPS Travel, for design reviews**			6.0	trip	1,500			9,000		EJ	SC	MA	CO	LI	9,135	X0	30
1.9.2.3.1	**BPS Travel, for design I/F**			8.0	trip	1,500			12,000		EJ	SC	MA	CO	LI	12,180	X0	30
1.9.2.3.1	**BPS Title I & II design, designer**						1040	40.17	41,777	CONTEC	EJ	IH	T2	CO	LI	59,072	X0	30
1.9.2.3.1	**BPS Title I & II design, engr.**						1040	65.18	67,790	CONTSM	EJ	IH	T2	CO	LI	93,987	X0	30
1.9.2.3.1	**FPS Rack design**						20	65.18	1,304	CONTSM	EJ	IH	T2	CO	LI	1,807	X0	30
1.9.2.3.1	**FPS Travel, for design I/F**			8.0	trip	1,500			12,000		EJ	SC	MA	CO	LI	12,180	X0	30
1.9.2.3.2	**FPS Racks**			1.0	ea.	1,500			1,500		EJ	IH	EQ	CO	LI	1,649	X1	30
1.9.2.3.2	**BPS Master module**			2.0	ea.	5,000			10,000		EJ	IH	EQ	CO	LI	10,990	X2	30
1.9.2.3.2	**FPS Master module**			2.0	ea.	5,000			10,000		EJ	IH	EQ	CO	LI	10,990	X2	30
1.9.2.3.2	**BPS Travel, for design I/F**			8.0	trip	1,500			12,000		EJ	SC	MA	CO	LI	13,188	X0	30
1.9.2.3.2	**BPS VME crate, incl. processor & utility board**			1.0	ea.	10,000			10,000		CP	IH	EQ	CO	LI	10,990	X2	30
1.9.2.3.2	**FPS VME crate, incl. processor & utility board**			1.0	ea.	10,000			10,000		CP	IH	EQ	CO	LI	10,990	X2	30
1.9.2.3.2	**FPS Carrier generator**			1.0	ea.	5,000			5,000		EJ	IH	EQ	CO	LI	5,495	X2	30
1.9.2.3.2	**FPS Slave module**			100.0	ea.	2,000			200,000		EJ	IH	EQ	CO	LI	219,800	X2	30
1.9.2.3.3	**FPS Title III engineering**						320	65.18	20,858	CONTSM	EJ	IH	T3	CO	LI	28,919	X0	30
1.9.2.3.3	**FPS Mat'l engineering & inspection**						40	65.18	2,607	CONTSM	EJ	IH	T3	CO	LI	3,615	X0	30
1.9.2.3.4	**FPS Software development**						880	65.18	57,361	CONTSM	EJ	IH	SW	CM	LI	79,528	X0	30
1.9.2.3.4	**BPS Software development**						905	65.18	58,990	CONTSM	EJ	IH	SW	CO	LI	81,787	X0	30
1.9.2.3.6	**Carrier cabling installation**						133.333	30.61	4,081	IND_EE	HC	IH	IN	CM	LI	4,201	X0	30
1.9.2.3.6	**Cabling, FPS carrier signal**			10,000.0	ft.	1			7,100		CP	SC	MA	CM	LI	8,520	X5	30
1.9.2.3.6	**F.O. terminations, ST mechanical connector**						66.6	30.61	2,039	IND_EE	HC	FP	IN	CM	LI	2,099	X0	30
1.9.2.3.6	**FPS H/W Installation**						200	29.96	5,992	ORNL_TEC	EJ	IH	IN	OR	LI	7,220	X0	30
1.9.2.3.6	**F.O. terminations, ST mechanical connector**			200.0	ea.	11			2,120		CP	FP	MA	CM	LI	2,544	X5	30
1.9.2.3.6	**FPS Rack fabrication**						80	40.17	3,214	CONTEC	EJ	IH	LA	CO	LI	4,544	X0	30
1.9.2.3.7	**BPS Checkout & start-up**						880	40.17	35,350	CONTEC	EJ	IH	IN	CO	LI	49,984	X0	30
1.9.2.3.7	**Travel, for BPS checkout support**			4.0	trip	1,500			6,000		EJ	SC	MA	OR	LI	6,090	X0	30
1.9.2.3.7	**BPS Checkout & start-up**						880	65.18	57,361	CONTSM	EJ	IH	T3	OR	LI	79,528	X0	30
1.9.2.3.7	**Travel, for FPS checkout support**			4.0	trip	1,500			6,000		EJ	SC	MA	OR	LI	6,090	X0	30
1.9.2.3.7	**FPS Checkout & start-up support**						800	29.96	23,968	ORNL_TEC	EJ	IH	IN	OR	LI	28,881	X0	30
1.9.2.3.7	**FPS Checkout & start-up support**						800	84.12	67,296	ORNL_TSM	EJ	IH	T3	OR	LI	81,056	X0	30
1.9.2.4	***Computing Equipment (C.R. Servers,etc.)***								713,761							808,670		

		Components		Materials/Equipment			Labor											
WBS	Item	No.	Cost	Qty	Unit	Unit Cost	Hrs	Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.2.4.1	Conceptual design of servers, engr.						80	84.12	6,730	ORNL_TSM	EJ	IH	T2	OR	LI	8,106	X0	30
1.9.2.4.1	Title I & II design of servers, engr.						200	84.12	16,824	ORNL_TSM	EJ	IH	T2	OR	LI	20,264	X0	30
1.9.2.4.1	Conceptual design of control & equip rooms, dftg.						120	29.96	3,595	ORNL_TEC	EJ	IH	T2	OR	LI	4,332	X0	30
1.9.2.4.1	Title I & II design of control & equip rooms, engr.						620	84.12	52,154	ORNL_TSM	EJ	IH	T2	OR	LI	62,818	X0	30
1.9.2.4.1	Title I & II design of control & equip rooms, dftg.						620	29.96	18,575	ORNL_TEC	EJ	IH	T2	OR	LI	22,383	X0	30
1.9.2.4.1	Conceptual design of control & equip rooms, engr.						120	84.12	10,094	ORNL_TSM	EJ	IH	T2	OR	LI	12,158	X0	30
1.9.2.4.1	Title I & II design of servers, drafting						100	29.96	2,996	ORNL_TEC	EJ	IH	T2	OR	LI	3,610	X0	30
1.9.2.4.2	Second graphics card w/ cables, for Sun Ultra 10 boot serv			6.0	ea.	270			1,620		VQ	IH	EQ	OR	LI	1,780	X1	30
1.9.2.4.2	Printer, color, with network connection			1.0	ea.	4,000			4,000		EJ	IH	EQ	OR	LI	4,396	X2	30
1.9.2.4.2	Video connector, for Sun Ultra 10 bootserver			6.0	ea.	40			240		VQ	IH	EQ	OR	LI	264	X1	30
1.9.2.4.2	RS-232/RS-422 converters			8.0	ea.	200			1,600		EJ	IH	EQ	OR	LI	1,758	X1	30
1.9.2.4.2	Mounting bracket for message display, Allen-Bradley 2706-			4.0	ea.	180			720		CP	IH	EQ	OR	LI	791	X1	30
1.9.2.4.2	Boot server, Sun Ultra 10 Server			6.0	ea.	8,225			49,350		VQ	IH	EQ	OR	LI	54,236	X2	30
1.9.2.4.2	Message display, Allen-Bradley "Dataliner" model 2706-F2			4.0	ea.	4,450			17,800		CP	IH	EQ	OR	LI	19,562	X2	30
1.9.2.4.2	Wireless network connections			6.0	ea.	2,000			12,000		CP	IH	EQ	OR	LI	13,188	X2	30
1.9.2.4.2	Control console millwork			12.0	ft	200			2,400		EJ	IH	EQ	OR	LI	2,638	X1	30
1.9.2.4.2	Control console millwork			12.0	ft	200			2,400		EJ	IH	EQ	OR	LI	2,638	X1	30
1.9.2.4.2	Printer, B&W, with network connection			1.0	ea.	2,000			2,000		EJ	IH	EQ	OR	LI	2,198	X2	30
1.9.2.4.2	Operator Interface (OPI), Sun Ultra 5 workstation, with 2 ea.			1.0	ea.	7,615			7,615		VQ	IH	EQ	OR	LI	8,369	X1	30
1.9.2.4.2	Printer, color, with network connection			1.0	ea.	4,000			4,000		EJ	IH	EQ	OR	LI	4,396	X2	30
1.9.2.4.2	Printer, B&W, with network connection			1.0	ea.	2,000			2,000		EJ	IH	EQ	OR	LI	2,198	X2	30
1.9.2.4.2	Operator Interface (OPI), Sun Ultra 5 workstation, with 2 ea.			1.0	ea.	7,615			7,615		VQ	IH	EQ	OR	LI	8,369	X1	30
1.9.2.4.2	Monitor, 21", with cable			12.0	ea.	1,380			16,560		VQ	IH	EQ	OR	LI	18,199	X1	30
1.9.2.4.2	Portable OPI			12.0	ea.	3,000			36,000		EJ	IH	EQ	OR	LI	39,564	X2	30
1.9.2.4.2	Control console millwork			64.0	ft	200			12,800		EJ	IH	EQ	OR	LI	14,067	X1	30
1.9.2.4.2	Second ethernet interface			1.0	ea.	1,000			1,000		EJ	IH	EQ	OR	LI	1,099	X1	30
1.9.2.4.2	Monitor, 19", with cable			1.0	ea.	725			725		VQ	IH	EQ	OR	LI	797	X1	30
1.9.2.4.2	Printer, color, with network connection			2.0	ea.	4,000			8,000		VQ	IH	EQ	OR	LI	8,792	X2	30
1.9.2.4.2	Printer, color, with network connection			1.0	ea.	4,000			4,000		EJ	IH	EQ	OR	LI	4,396	X2	30
1.9.2.4.2	Printer, B&W, with network connection			2.0	ea.	2,000			4,000		VQ	IH	EQ	OR	LI	4,396	X2	30
1.9.2.4.2	Control console millwork			6.0	ft	200			1,200		EJ	IH	EQ	OR	LI	1,319	X1	30
1.9.2.4.2	Operator Interface (OPI), Sun Ultra 5 workstation, with 2 ea.			12.0	ea.	7,615			91,380		VQ	IH	EQ	OR	LI	100,427	X1	30
1.9.2.4.2	Server, Sun Enterprise 450			1.0	ea.	50,550			50,550		VQ	IH	EQ	OR	LI	55,554	X2	30
1.9.2.4.2	Instrument racks, for equip. room			24.0	ea.	1,000			24,000		CP	IH	EQ	OR	LI	26,376	X1	30
1.9.2.4.2	Workstation with large-screen display			2.0	ea.	5,000			10,000		EJ	IH	EQ	OR	LI	10,990	X1	30
1.9.2.4.2	Boot server, Sun Ultra 10 Server			1.0	ea.	8,225			8,225		VQ	IH	EQ	OR	LI	9,039	X2	30
1.9.2.4.2	Server, Sun Enterprise 450			1.0	ea.	50,550			50,550		VQ	IH	EQ	OR	LI	55,554	X2	30
1.9.2.4.2	L1000 DLT Tape Library (1 drive) plus cables			1.0	ea.	54,000			54,000		EJ	IH	EQ	OR	LI	59,346	X2	30
1.9.2.4.3	Mat'ls Engr. & Inspection for displays, tech.						80	29.96	2,397	ORNL_TEC	EJ	IH	IN	OR	LI	2,888	X0	30
1.9.2.4.3	Mat'ls Engr. & Inspection for displays, engr.						80	84.12	6,730	ORNL_TSM	EJ	IH	T3	OR	LI	8,106	X0	30
1.9.2.4.3	Title III design of control & equip rooms						444	84.12	37,349	ORNL_TSM	EJ	IH	T3	OR	LI	44,986	X0	30
1.9.2.4.3	Title III design of servers, engr.						114	84.12	9,590	ORNL_TSM	EJ	IH	T3	OR	LI	11,550	X0	30
1.9.2.4.4	S/W Driver for exp. area message displays						240	65.18	15,644	CONTSM	EJ	IH	SW	OR	LI	21,689	X0	30
1.9.2.4.5	Fabrication of server racks						64	30.61	1,959	IND_EE	EJ	IH	LA	CM	LI	2,017	X0	30
1.9.2.4.6	Installation of server hardware, electrician						64	30.61	1,959	IND_EE	EJ	IH	IN	CM	LI	2,017	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.2.4.6	Installation of server hardware, tech.						64	29.96	1,917	ORNL_TEC	EJ	IH	IN	OR	LI	2,311	X0	30
1.9.2.4.6	Installation of display H/W, tech.						320	29.96	9,587	ORNL_TEC	EJ	IH	IN	OR	LI	11,553	X0	30
1.9.2.4.6	On-site preparation for displays, tech.						320	29.96	9,587	ORNL_TEC	EJ	IH	IN	OR	LI	11,553	X0	30
1.9.2.4.6	On-site preparation for displays, electrician						320	30.61	9,795	IND_EE	EJ	IH	IN	CM	LI	10,083	X0	30
1.9.2.4.7	Checkout of servers, tech.						40	29.96	1,198	ORNL_TEC	EJ	IH	IN	OR	LI	1,444	X0	30
1.9.2.4.7	Checkout of display H/W, engr.						80	84.12	6,730	ORNL_TSM	EJ	IH	T3	OR	LI	8,106	X0	30
1.9.2.5	***Software (System & Application)***								1,924,376							2,540,813		
1.9.2.5.2	S/W Licenses			1.0	lot	200,000			200,000		EJ	SC	MA	CO	LI	219,800	X1	30
1.9.2.5.2	Database licenses & tech support			1.0	lot	200,000			200,000		EJ	SC	MA	CO	LI	219,800	X1	30
1.9.2.5.4	Travel, for design interface			12.0	trip	1,500			18,000		EJ	SC	MA	CO	LI	18,270	X0	30
1.9.2.5.4	System S/W development						7040	65.18	458,885	CONTSM	EJ	IH	SW	CO	LI	636,221	X0	30
1.9.2.5.4	Application development						15840	65.18	1,032,491	CONTSM	EJ	IH	SW	CO	LI	1,431,497	X0	30
1.9.2.5.4	Travel, EPICS collaboration meetins			10.0	trip	1,500			15,000		EJ	SC	MA	CO	LI	15,225	X0	30
1.9.2.6	***Software Development System***								929,507							1,137,718		
1.9.2.6.1	Title I & II design of racks, engr.						160	65.18	10,429	CONTSM	EJ	IH	T2	OR	LI	14,460	X0	30
1.9.2.6.1	Cable design						320	65.18	20,858	CONTSM	EJ	IH	T2	OR	LI	28,919	X0	30
1.9.2.6.1	Racks - engineering						160	65.18	10,429	CONTSM	EJ	IH	T2	OR	LI	14,460	X0	30
1.9.2.6.1	Cabling - engineering						320	65.18	20,858	CONTSM	EJ	IH	T2	OR	LI	28,919	X0	30
1.9.2.6.2	Printer, B&W, with network connection			1.0	ea.	2,000			2,000		CP	IH	EQ	OR	LI	2,198	X2	30
1.9.2.6.2	Hardware lab equipment			1.0	lot	62,000			62,000		EJ	IH	EQ	OR	LI	68,138	X1	30
1.9.2.6.2	Operator Interface (OPI), Sun Ultra 5 workstation, with 1 ea.			8.0	ea.	5,925			47,400		VQ	IH	EQ	OR	LI	52,093	X2	30
1.9.2.6.2	Furniture			1.0	lot	10,000			10,000		EJ	IH	EQ	OR	LI	10,990	X1	30
1.9.2.6.2	Racks - procurement			4.0	ea	3,000			12,000		EJ	SC	MA	OR	LI	13,188	X2	30
1.9.2.6.2	Signal conditioning			200.0	chan	10			2,000		EJ	SC	MA	OR	LI	2,198	X1	30
1.9.2.6.2	Test facility equipment			1.0	lot	55,000			55,000		EJ	IH	EQ	OR	LI	60,445	X1	30
1.9.2.6.2	Consumables			1.0	lot	100,000			100,000		EJ	IH	EQ	OR	LI	109,900	X1	30
1.9.2.6.2	IOC systems			8.0	ea.	20,000			160,000		CP	IH	EQ	OR	LI	175,840	X2	30
1.9.2.6.2	Instrument racks			8.0	ea.	1,500			12,000		CP	IH	EQ	OR	LI	13,188	X1	30
1.9.2.6.2	Printer, color, with network connection			1.0	ea.	4,000			4,000		CP	IH	EQ	OR	LI	4,396	X2	30
1.9.2.6.2	Message display, Allen-Bradley "Dataliner" model 2706-F2			1.0	ea.	4,450			4,450		CP	IH	EQ	OR	LI	4,891	X2	30
1.9.2.6.2	PLC programming software			2.0	ea.	3,500			7,000		CP	SC	MA	OR	LI	7,693	X2	30
1.9.2.6.2	PLC systems			2.0	ea.	10,000			20,000		CP	IH	EQ	OR	LI	21,980	X2	30
1.9.2.6.3	Title III engr.						20	40.17	803	CONTEC	EJ	IH	T3	OR	LI	1,136	X0	30
1.9.2.6.3	Install supv., engr.						40	65.18	2,607	CONTSM	EJ	IH	T3	OR	LI	3,615	X0	30
1.9.2.6.3	Mat'ls Engr. & Inspection						20	65.18	1,304	CONTSM	EJ	IH	T3	OR	LI	1,807	X0	30
1.9.2.6.3	Mat'ls Engr. & Inspection						260	40.17	10,444	CONTEC	EJ	IH	IN	OR	LI	14,768	X0	30
1.9.2.6.4	Software design, 200 pts.						600	65.18	39,110	CONTSM	EJ	IH	T2	OR	LI	54,223	X0	30
1.9.2.6.4	IOC software						600	65.18	39,110	CONTSM	EJ	IH	SW	OR	LI	54,223	X0	30
1.9.2.6.5	Rack fab						80	40.17	3,214	CONTEC	EJ	IH	LA	OR	LI	4,544	X0	30
1.9.2.6.6	Cabling - procurement			200.0	chan	90			18,000		EJ	IH	EQ	OR	LI	19,782	X1	30
1.9.2.6.6	Cabling - installation						320	30.61	9,795	IND_EE	EJ	CM	IN	CM	LI	10,083	X0	30
1.9.2.6.6	Racks - installation						40	30.61	1,224	IND_EE	EJ	CM	IN	CM	LI	1,260	X0	30
1.9.2.6.6	Rack installation						20	30.61	612	IND_EE	EJ	CM	IN	CM	LI	630	X0	30
1.9.2.6.6	On-site preparation, tech.						160	40.17	6,427	CONTEC	EJ	IH	IN	OR	LI	9,088	X0	30
1.9.2.6.6	Tech for H/W lab operation						5280	40.17	212,098	CONTEC	EJ	IH	IN	OR	LI	299,906	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.2.6.6	Installation, tech.						160	40.17	6,427	CONTEC	EJ	IH	IN	OR	LI	9,088	X0	30
1.9.2.6.6	On-site preparation, electrician						160	30.61	4,898	IND_EE	EJ	CM	IN	CM	LI	5,042	X0	30
1.9.2.6.6	Cable installation						320	30.61	9,795	IND_EE	EJ	CM	LA	CM	LI	10,083	X0	30
1.9.2.6.6	Racks - technician support						80	40.17	3,214	CONTEC	EJ	IH	IN	OR	LI	4,544	X0	30
1.9.3	Controls SUBTOTAL	1	799,765	0.0		0	0	0.00	0							0		0
1.9.3	***Front End Systems***								800,217							942,217		
1.9.3.1	Controls Integration	1	241,947	0.0		0	0	0.00	0							0		0
1.9.3.1	***Front End Control System Integration***								241,947							284,937		
1.9.3.1.1	Integration Travel for ICSWG for 1 year			3.0	ea	9,000			27,000	0	EJ	FP	MA	LB	LI	27,000	X0	0
1.9.3.1.2	Integration Project control						1080	79.61	85,979	CSE4	EJ	IH	PM	LB	LI	103,175	X0	30
1.9.3.1.3	Integration Engineering Support TIII						810	79.61	64,484	CSE4	EJ	IH	T3	LB	LI	77,381	X0	30
1.9.3.1.4	Integration Engineering Support TI&II						810	79.61	64,484	CSE4	EJ	IH	T2	LB	LI	77,381	X0	30
1.9.3.2	Controls Ion Source and LEBT	1	100,356	0.0		0	0	0.00	0							0		0
1.9.3.2	***Ion Source Controls***								100,356							117,888		
1.9.3.2.1	Ion Source and LEBT EDI	1	7,101	0.0		0	0	0.00	0							0		0
1.9.3.2.1.1	EDI Application software SUPPORT						100	71.01	7,101	CSE3	EJ	IH	SW	LB	LI	8,521	X0	30
1.9.3.2.2	Ion Source and LEBT Hardware Purchase	1	29,118	0.0		0	0	0.00	0							0		0
1.9.3.2.2.1	Hardware Purchase Ion Source/LEBT VME modules			1.0	lot	2,596			2,596	0	VQ	FP	MA	LB	LI	2,889	X1	10
1.9.3.2.2.2	Hardware Purchase Ion Source/LEBT G3 modules			1.0	lot	26,522			26,522	0	VQ	FP	MA	LB	LI	29,514	X1	10
1.9.3.2.3	Ion Source and LEBT Software Configure	1	53,044	0.0		0	0	0.00	0							0		0
1.9.3.2.3.1	Software Configure Ion Source/LEBT VME point						96	71.01	6,817	CSE3	EJ	IH	SW	LB	LI	8,180	X0	30
1.9.3.2.3.2	Software Configure Ion Source/LEBT G3 point						611	71.01	43,387	CSE3	EJ	IH	SW	LB	LI	52,065	X0	30
1.9.3.2.3.3	Software Configure Ion Source/LEBT VME Crate						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	30
1.9.3.2.4	Ion Source and LEBT Installation	1	11,093	0.0		0	0	0.00	0							0		0
1.9.3.2.4.1	Installation Ion Source/LEBT VME point						6	34.95	210	ET2	EJ	IH	IN	LB	LI	252	X0	20
1.9.3.2.4.2	Installation Ion Source/LEBT VME point						6	71.01	426	CSE3	EJ	IH	T3	LB	LI	511	X0	20
1.9.3.2.4.3	Installation Ion Source/LEBT G3 point						85.5	34.95	2,988	ET2	EJ	IH	IN	LB	LI	3,585	X0	20
1.9.3.2.4.4	Installation Ion Source/LEBT G3 point						85.5	71.01	6,071	CSE3	EJ	IH	T3	LB	LI	7,286	X0	20
1.9.3.2.4.5	Installation Ion Source/LEBT VME crate						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.3	***LEBT Controls***								0							0		
1.9.3.4	Controls RFQ	1	110,525	0.0		0	0	0.00	0							0		0
1.9.3.4	***RFQ Controls***								110,526							129,386		
1.9.3.4.1	RFQ EDI	1	10,652	0.0		0	0	0.00	0							0		0
1.9.3.4.1.1	EDI RFQ Application Support						150	71.01	10,652	CSE3	EJ	IH	SW	LB	LI	12,782	X0	30
1.9.3.4.2	RFQ Hardware Purchase	1	37,180	0.0		0	0	0.00	0							0		0
1.9.3.4.2.1	Hardware Purchase RFQ G3 modules			1.0	lot	6,917			6,917		VQ	FP	MA	LB	LI	7,697	X1	15
1.9.3.4.2.2	Hardware Purchase RFQ VME modules			1.0	lot	10,952			10,952		VQ	FP	MA	LB	LI	12,187	X1	15
1.9.3.4.2.3	Hardware Purchase RFQ PLC modules			1.0	lot	14,069			14,069		VQ	FP	MA	LB	LI	15,656	X1	15
1.9.3.4.2.4	Hardware Purchase RFQ VXI modules			1.0	lot	5,243			5,243		VQ	FP	MA	LB	LI	5,834	X1	15
1.9.3.4.3	RFQ Software Configure	1	39,766	0.0		0	0	0.00	0							0		0
1.9.3.4.3.1	Software Configure RFQ VME points						100	71.01	7,101	CSE3	EJ	IH	SW	LB	LI	8,521	X0	30
1.9.3.4.3.2	Software Configure RFQ PLC points						80	71.01	5,681	CSE3	EJ	IH	SW	LB	LI	6,817	X0	30
1.9.3.4.3.3	Software Configure RFQ G3 points						140	71.01	9,941	CSE3	EJ	IH	SW	LB	LI	11,930	X0	30
1.9.3.4.3.4	Software Configure RFQ VXI points						160	71.01	11,362	CSE3	EJ	IH	SW	LB	LI	13,634	X0	30
1.9.3.4.3.5	Software Configure RFQ VME Crates						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.3.4.3.6	**Software Configure RFQ VXI Crate**						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	30
1.9.3.4.4	**RFQ Installation**	1	22,927	0.0		0	0	0.00	0							0		0
1.9.3.4.4.1	**Installation RFQ VME point**						50	34.95	1,747	ET2	EJ	IH	IN	LB	LI	2,097	X0	20
1.9.3.4.4.2	**Installation RFQ PLC point**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.4.4.3	**Installation RFQ G3 points**						20	34.95	699	ET2	EJ	IH	IN	LB	LI	839	X0	20
1.9.3.4.4.4	**Installation RFQ VXI points**						80	34.95	2,796	ET2	EJ	IH	IN	LB	LI	3,355	X0	20
1.9.3.4.4.5	**Installation RFQ VME point**						50	71.01	3,551	CSE3	EJ	IH	T3	LB	LI	4,261	X0	20
1.9.3.4.4.6	**Installation RFQ PLC point**						40	71.01	2,840	CSE3	EJ	IH	T3	LB	LI	3,408	X0	20
1.9.3.4.4.7	**Installation RFQ G3 points**						20	71.01	1,420	CSE3	EJ	IH	T3	LB	LI	1,704	X0	20
1.9.3.4.4.8	**Installation RFQ VXI points**						80	71.01	5,681	CSE3	EJ	IH	T3	LB	LI	6,817	X0	20
1.9.3.4.4.9	**Installation RFQ VME Crate**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.4.4.10	**Installation RFQ VXI Crate**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.5	**Controls MEBT**	1	185,741	0.0		0	0	0.00	0							0		0
1.9.3.5	***MEBT Controls***								185,741							218,855		
1.9.3.5.1	**MEBT EDI**	1	14,202	0.0		0	0	0.00	0							0		0
1.9.3.5.1.1	**EDI MEBT Application Support**						200	71.01	14,202	CSE3	EJ	IH	SW	LB	LI	17,042	X0	30
1.9.3.5.2	**MEBT Hardware Purchase**	1	46,242	0.0		0	0	0.00	0							0		0
1.9.3.5.2.1	**Hardware Purchase MEBT VME modules**			1.0	lot	9,971			9,971		VQ	FP	MA	LB	LI	11,096	X1	15
1.9.3.5.2.2	**Hardware Purchase MEBT G3 Modules**			1.0	lot	31,028			31,028		VQ	FP	MA	LB	LI	34,528	X1	15
1.9.3.5.2.3	**Hardware Purchase MEBT VXI modules**			1.0	lot	5,243			5,243		VQ	FP	MA	LB	LI	5,834	X1	15
1.9.3.5.3	**MEBT Software Configure**	1	97,390	0.0		0	0	0.00	0							0		0
1.9.3.5.3.1	**Software Configure MEBT VME point**						192	71.01	13,634	CSE3	EJ	IH	SW	LB	LI	16,361	X0	30
1.9.3.5.3.2	**Software Configure MEBT G3 point**						955.5	71.01	67,850	CSE3	EJ	IH	SW	LB	LI	81,420	X0	30
1.9.3.5.3.3	**Software Configure MEBT VXI point**						144	71.01	10,225	CSE3	EJ	IH	SW	LB	LI	12,271	X0	30
1.9.3.5.3.4	**Software Configure MEBT VME Crate**						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	30
1.9.3.5.3.5	**Software Configure MEBT VXI Crate**						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	30
1.9.3.5.4	**MEBT Installation**	1	27,907	0.0		0	0	0.00	0							0		0
1.9.3.5.4.1	**Installation MEBT VME point**						28.5	34.95	996	ET2	EJ	IH	IN	LB	LI	1,195	X0	20
1.9.3.5.4.2	**Installation MEBT G3 point**						136.5	34.95	4,770	ET2	EJ	IH	IN	LB	LI	5,724	X0	20
1.9.3.5.4.3	**Installation MEBT VXI point**						72	34.95	2,516	ET2	EJ	IH	IN	LB	LI	3,019	X0	20
1.9.3.5.4.4	**Installation MEBT VME point**						28.5	71.01	2,024	CSE3	EJ	IH	T3	LB	LI	2,429	X0	20
1.9.3.5.4.5	**Installation MEBT G3 point**						136.5	71.01	9,693	CSE3	EJ	IH	T3	LB	LI	11,631	X0	20
1.9.3.5.4.6	**Installation MEBT VXI point**						72	71.01	5,113	CSE3	EJ	IH	T3	LB	LI	6,135	X0	20
1.9.3.5.4.7	**Installation MEBT VME Crate**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.5.4.8	**Installation MEBT VXI Crate**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.6	**Controls Vacuum and Cooling**	1	161,647	0.0		0	0	0.00	0							0		0
1.9.3.6	***Cooling and Vacuum Controls***								161,648							191,151		
1.9.3.6.1	**Vacuum and Cooling EDI**	1	7,101	0.0		0	0	0.00	0							0		0
1.9.3.6.1.1	**EDI Vacuum/Cooling Application Support**						100	71.01	7,101	CSE3	EJ	IH	SW	LB	LI	8,521	X0	30
1.9.3.6.2	**Vacuum and Cooling Hardware Purchase**	1	32,399	0.0		0	0	0.00	0							0		0
1.9.3.6.2.1	**Hardware Purchase Vacuum (IS-LEBT) PLC modules**			1.0	lot	3,234			3,234		VQ	FP	MA	LB	LI	3,599	X1	15
1.9.3.6.2.2	**Hardware Purchase Vacuum (RFQ) PLC modules**			1.0	lot	7,798			7,798		VQ	FP	MA	LB	LI	8,677	X1	15
1.9.3.6.2.3	**Hardware Purchase Vacuum (MEBT) PLC modules**			1.0	lot	7,670			7,670		VQ	FP	MA	LB	LI	8,535	X1	15
1.9.3.6.2.4	**Hardware Purchase Vacuum (Common) PLC modules**			1.0	lot	11,101			11,101		VQ	FP	MA	LB	LI	12,353	X1	15
1.9.3.6.2.5	**Hardware Purchase Vacuum VME Modules**			1.0	lot	2,596			2,596		VQ	FP	MA	LB	LI	2,889	X1	15

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1.9.3.6.3	**Vacuum and Cooling Software Configure**	1	102,061	0.0		0	0	0.00	0							0		0
1.9.3.6.3.1	**Software Configure Vacuum VME point**						1022	71.01	72,572	CSE3	EJ	IH	SW	LB	LI	87,087	X0	30
1.9.3.6.3.2	**Software Configure Vacuum PLC point**						600	34.95	20,967	ET2	EJ	IH	SW	LB	LI	25,161	X0	30
1.9.3.6.3.3	**Software Configure Vacuum PLC Ladder**						40	71.01	2,840	CSE3	EJ	IH	SW	LB	LI	3,408	X0	0
1.9.3.6.3.4	**Software Configure Vacuum VME Crate**						80	71.01	5,681	CSE3	EJ	IH	SW	LB	LI	6,817	X0	30
1.9.3.6.4	**Vacuum and Cooling Installation**	1	20,087	0.0		0	0	0.00	0							0		0
1.9.3.6.4.1	**Installation Vacuum PLC point**						150	34.95	5,242	ET2	EJ	IH	IN	LB	LI	6,290	X0	20
1.9.3.6.4.2	**Installation Vacuum PLC point**						150	71.01	10,652	CSE3	EJ	IH	T3	LB	LI	12,782	X0	20
1.9.3.6.4.3	**Installation Vacuum VME crate**						40	34.95	1,398	ET2	EJ	IH	IN	LB	LI	1,677	X0	20
1.9.3.6.4.4	**Installation Vacuum PLC crate**						80	34.95	2,796	ET2	EJ	IH	IN	LB	LI	3,355	X0	20
1.9.4	***Linac Control Systems***								10,359,663							16,095,443		
1.9.4.1	***Linac Control Systems Integration***								3,009,525							4,935,148		
1.9.4.1.1	**Staff**			0.0			0		0							0		0
1.9.4.1.1	**Level 3 Team Leader (L3TM)**						10560	76.20	804,672	LANL_MGR	EJ	IH	PM	LA	LI	1,408,176	X0	30
1.9.4.1.1	**Lead Engineer**			0.0			0		0							0		0
1.9.4.1.1	**DB Administrator**						3520	58.48	205,850	LANL_TSM	EJ	IH	PM	LA	LI	360,237	X0	30
1.9.4.1.1	**System Administrator**						3520	58.48	205,850	LANL_TSM	EJ	IH	PM	LA	LI	360,237	X0	30
1.9.4.1.1	**Project Controls**						1760	58.48	102,925	LANL_TSM	EJ	IH	PM	LA	LI	180,118	X0	30
1.9.4.1.2	**Travel**			0.0			0		0							0		0
1.9.4.1.2	**ICWG travel (L3TM)**			72.0	trip	1,500			108,000		HC	SC	MA	LA	LI	123,120	X0	30
1.9.4.1.2	**TI&II design interface travel**			12.0	trip	1,500			18,000		HC	SC	MA	LA	LI	20,520	X0	30
1.9.4.1.2	**TIII design interface travel**			24.0	trip	1,500			36,000		HC	SC	MA	LA	LI	41,040	X0	30
1.9.4.1.2	**Checkout travel, engr.**			24.0	trip	2,500			60,000		HC	SC	MA	LA	LI	68,400	X0	30
1.9.4.1.2	**Checkout travel, technician**			24.0	trip	2,500			60,000		HC	SC	MA	LA	LI	68,400	X0	30
1.9.4.1.3	**Lab Instruments**			1.0	lot	100,000			100,000		EJ	IH	EQ	LA	LI	117,000	X1	30
1.9.4.1.3	**SNS Server and development stand**			1.0	lot	25,000			25,000		EJ	IH	EQ	LA	LI	29,250	X1	30
1.9.4.1.3	**Lab Support**			0.0			0		0							0		0
1.9.4.1.3	**Technician for lab support**						7040	44.01	309,830	LANL_TEC	EJ	IH	LA	LA	LI	542,203	X0	30
1.9.4.1.3	**Lab supplies (consummables)**			1.0	lot	150,000			150,000		EJ	SC	MA	LA	LI	175,500	X1	30
1.9.4.1.4	**Applications**			0.0			0		0							0		0
1.9.4.1.4	**Software development staff (LOE)**						14080	58.48	823,398	LANL_TSM	EJ	IH	SW	LA	LI	1,440,947	X0	30
1.9.4.2	***DTL Control Systems***								34,040							49,284		
1.9.4.2.1	**DTL Vacuum Systems**			0.0			0		0							0		0
1.9.4.2.1.1	**Title I&II Engineering for vac IOC**						10	58.48	585	LANL_TSM	EJ	IH	T2	LA	LI	1,023	X0	30
1.9.4.2.1.1	**Title I&II Engineering for vac PLC**							58.48	0	LANL_TSM	EJ	IH	T2	LA	LI	0	X0	30
1.9.4.2.1.2	**IOC hardware, for vac sys**			0.3	system	13,310			3,328		CP	IH	EQ	LA	LI	3,893	X1	30
1.9.4.2.1.2	**Rack, for vac IOC**			0.1	ea	1,500			188		CP	IH	EQ	LA	LI	219	X1	30
1.9.4.2.1.2	**Signal conditioning, for vac IOC**			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.2.1.2	**PLC hardware, for vac sys**			0.0	system	25,600			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.2.1.2	**Rack, for vac PLC**			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.2.1.3	**Title III Engineering for vac IOC**						10	58.48	585	LANL_TSM	EJ	IH	T3	LA	LI	1,023	X0	30
1.9.4.2.1.3	**Matls engr & inspect for vac IOC**						1	58.48	58	LANL_TSM	EJ	IH	T3	LA	LI	102	X0	30
1.9.4.2.1.3	**Title III Engineering for vac PLC**							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.2.1.3	**Matls engr & inspect for vac PLC**							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.2.1.4	**Software for vac IOC**			128.0	chan.		10	58.48	585	LANL_TSM	EJ	IH	SW	LA	LI	1,023	X0	30

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1.9.4.2.1.4	Software for vac PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30
1.9.4.2.1.5	Fab, config, & test of vac IOC rack, tech						5	44.01	220	LANL_TEC	EJ	IH	LA	LA	LI	385	X0	30
1.9.4.2.1.5	Fab of vac IOC rack, crafts						5	27.00	135	LANL_CFT	EJ	IH	LA	LA	LI	236	X0	30
1.9.4.2.1.5	Fab, config, & test of vac PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.2.1.5	Fab of vac PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.2.1.6	Installation, vac IOC rack						2	30.61	61	IND_EE	HC	FP	IN	CM	LI	63	X0	30
1.9.4.2.1.6	On-site preparation for vac IOC						2	29.96	60	SNS_TEC	EJ	IH	IN	LA	LI	72	X0	30
1.9.4.2.1.6	Installation, vac PLC rack							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.2.1.6	Cable, PLC-to-IOC & remote I/O comm.			0.0	ft.	1			0		CP	FP	MA	LA	LI	0	X1	30
1.9.4.2.1.6	Cable installation labor, comm. cable							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.2.1.6	Cable termination, vac PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.2.1.6	On-site preparation of vac PLC							29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.2.1.7	Testing, vac IOC, engr.			128.0	chan		64	58.48	3,743	LANL_TSM	EJ	IH	T3	LA	LI	6,550	X0	30
1.9.4.2.1.7	Testing, vac IOC, tech			128.0	chan		64	29.96	1,917	SNS_TEC	EJ	IH	IN	LA	LI	2,311	X0	30
1.9.4.2.1.7	Testing, vac PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.2.1.7	Testing, vac PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.2.2	DTL Cooling Systems			0.0			0		0							0		0
1.9.4.2.2.1	Title I&II Engineering for Cooling Sys IOC						10	58.48	585	LANL_TSM	EJ	IH	T2	LA	LI	1,023	X0	30
1.9.4.2.2.1	Title I&II Engineering for Cooling Sys PLC						10	58.48	585	LANL_TSM	EJ	IH	T2	LA	LI	1,023	X0	30
1.9.4.2.2.2	IOC hardware, for Cooling sys			0.3	system	20,000			5,000		CP	IH	EQ	LA	LI	5,850	X1	30
1.9.4.2.2.2	Rack, for Cooling Sys IOC			0.1	ea	1,500			188		CP	IH	EQ	LA	LI	219	X1	30
1.9.4.2.2.2	Signal conditioning, for Cooling Sys IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.2.2.2	PLC hardware, for Cooling sys			0.3	system	12,800			3,200		CP	IH	EQ	LA	LI	3,744	X1	30
1.9.4.2.2.2	Rack, for Cooling Sys PLC			0.3	ea	1,500			375		CP	IH	EQ	LA	LI	439	X1	30
1.9.4.2.2.3	Title III Engineering for Cooling Sys IOC						10	58.48	585	LANL_TSM	EJ	IH	T3	LA	LI	1,023	X0	30
1.9.4.2.2.3	Matls engr & inspect for Cooling Sys IOC						1	58.48	58	LANL_TSM	EJ	IH	T3	LA	LI	102	X0	30
1.9.4.2.2.3	Title III Engineering for Cooling Sys PLC						10	58.48	585	LANL_TSM	EJ	IH	T3	LA	LI	1,023	X0	30
1.9.4.2.2.3	Matls engr & inspect for Cooling Sys PLC						1	58.48	58	LANL_TSM	EJ	IH	T3	LA	LI	102	X0	30
1.9.4.2.2.4	Software for Cooling Sys IOC			24.0	chan.		24	58.48	1,404	LANL_TSM	EJ	IH	SW	LA	LI	2,456	X0	30
1.9.4.2.2.4	Software for Cooling Sys PLC			24.0	chan.		24	58.48	1,404	LANL_TSM	EJ	IH	SW	LA	LI	2,456	X0	30
1.9.4.2.2.5	Fab, config, & test of Cooling Sys IOC rack, tech						10	44.01	440	LANL_TEC	EJ	IH	LA	LA	LI	770	X0	30
1.9.4.2.2.5	Fab of Cooling Sys IOC rack, crafts						5	27.00	135	LANL_CFT	EJ	IH	LA	LA	LI	236	X0	30
1.9.4.2.2.5	Fab, config, & test of Cooling Sys PLC rack, tech						10	44.01	440	LANL_TEC	EJ	IH	LA	LA	LI	770	X0	30
1.9.4.2.2.5	Fab of Cooling Sys PLC rack, crafts						5	27.00	135	LANL_CFT	EJ	IH	LA	LA	LI	236	X0	30
1.9.4.2.2.6	Installation, Cooling Sys IOC rack						2	30.61	61	IND_EE	HC	FP	IN	CM	LI	63	X0	30
1.9.4.2.2.6	Cable termination, Cooling Sys IOC rack						1.188	29.96	36	SNS_TEC	EJ	IH	IN	LA	LI	43	X0	30
1.9.4.2.2.6	On-site preparation for Cooling Sys IOC						2	29.96	60	SNS_TEC	EJ	IH	IN	LA	LI	72	X0	30
1.9.4.2.2.6	Installation, Cooling Sys PLC rack						2	30.61	61	IND_EE	HC	FP	IN	CM	LI	63	X0	30
1.9.4.2.2.6	Cable, PLC-to-IOC & remote I/O comm.			25.0	ft.	1			25		CP	FP	MA	LA	LI	30	X1	30
1.9.4.2.2.6	Cable installation labor						0.28575	30.61	9	IND_EE	HC	FP	IN	CM	LI	9	X0	30
1.9.4.2.2.6	Cable termination, Cooling Sys PLC rack			24.0	chan.		2.376	29.96	71	SNS_TEC	HC	IH	IN	LA	LI	86	X0	30
1.9.4.2.2.6	On-site preparation for Cooling Sys PLC						2	29.96	60	SNS_TEC	EJ	IH	IN	LA	LI	72	X0	30
1.9.4.2.2.7	Testing, Cooling Sys IOC, engr.			24.0	chan		12	58.48	702	LANL_TSM	EJ	IH	T3	LA	LI	1,228	X0	30
1.9.4.2.2.7	Testing, Cooling Sys IOC, tech			24.0	chan		12	29.96	360	SNS_TEC	EJ	IH	IN	LA	LI	433	X0	30
1.9.4.2.2.7	Testing, Cooling Sys PLC, engr.			24.0	chan		12	58.48	702	LANL_TSM	EJ	IH	T3	LA	LI	1,228	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.2.2.7	Testing, Cooling Sys PLC, tech			24.0	chan		12	29.96	360	SNS_TEC	EJ	IH	IN	LA	LI	433	X0	30
1.9.4.2.3	DTL Power Systems			0.0			0		0							0		0
1.9.4.2.3.1	Title I&II Engineering for Mag Pwr Sup IOC						2	58.48	117	LANL_TSM	EJ	IH	T2	LA	LI	205	X0	30
1.9.4.2.3.1	Title I&II Engineering for mag PS PLC						2	58.48	117	LANL_TSM	EJ	IH	T2	LA	LI	205	X0	30
1.9.4.2.3.2	IOC hardware, for Mag Pwr Sup Sys			0.1	system	13,310			666		CP	IH	EQ	LA	LI	779	X1	30
1.9.4.2.3.2	Rack, for Mag Pwr Sup IOC			0.0	ea	1,500			38		CP	IH	EQ	LA	LI	44	X1	30
1.9.4.2.3.2	Signal conditioning, for Mag Pwr Sup IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.2.3.2	PLC hardware, for mag PS			0.1	system	26,000			1,300		CP	IH	EQ	LA	LI	1,521	X1	30
1.9.4.2.3.2	Rack, for mag PS PLC			0.1	ea	1,500			75		CP	IH	EQ	LA	LI	88	X1	30
1.9.4.2.3.3	Title III Engineering for Mag Pwr Sup IOC						2	58.48	117	LANL_TSM	EJ	IH	T3	LA	LI	205	X0	30
1.9.4.2.3.3	Matls engr & inspect for Mag Pwr Sup IOC						0.2	58.48	12	LANL_TSM	EJ	IH	T3	LA	LI	20	X0	30
1.9.4.2.3.3	Title III Engineering for mag PS PLC						2	58.48	117	LANL_TSM	EJ	IH	T3	LA	LI	205	X0	30
1.9.4.2.3.3	Matls engr & inspect for mag PS PLC						0.2	58.48	12	LANL_TSM	EJ	IH	T3	LA	LI	20	X0	30
1.9.4.2.3.4	Software for Mag Pwr Sup IOC			10.0	chan.		10	58.48	585	LANL_TSM	EJ	IH	SW	LA	LI	1,023	X0	30
1.9.4.2.3.4	Software for mag PS PLC			10.0	chan.		10	58.48	585	LANL_TSM	EJ	IH	SW	LA	LI	1,023	X0	30
1.9.4.2.3.5	Fab, config, & test of Mag Pwr Sup IOC rack, tech						1	44.01	44	LANL_TEC	EJ	IH	LA	LA	LI	77	X0	30
1.9.4.2.3.5	Fab of Mag Pwr Sup IOC rack, crafts						1	27.00	27	LANL_CFT	EJ	IH	LA	LA	LI	47	X0	30
1.9.4.2.3.5	Fab, config, & test of mag PS PLC rack, tech						2	44.01	88	LANL_TEC	EJ	IH	LA	LA	LI	154	X0	30
1.9.4.2.3.5	Fab of mag PS PLC rack, crafts						1	27.00	27	LANL_CFT	EJ	IH	LA	LA	LI	47	X0	30
1.9.4.2.3.6	Installation, Mag Pwr Sup IOC rack						0.4	30.61	12	IND_EE	HC	FP	IN	CM	LI	13	X0	30
1.9.4.2.3.6	On-site preparation for Mag Pwr Sup IOC						0.4	29.96	12	SNS_TEC	EJ	IH	IN	LA	LI	14	X0	30
1.9.4.2.3.6	Installation, mag PS PLC rack						0.4	30.61	12	IND_EE	HC	FP	IN	CM	LI	13	X0	30
1.9.4.2.3.6	Cable, PLC-to-IOC & remote I/O comm.			5.0	ft.	1			5		CP	FP	MA	LA	LI	6	X1	30
1.9.4.2.3.6	Cable installation labor						0.05715	30.61	2	IND_EE	HC	FP	IN	CM	LI	2	X0	30
1.9.4.2.3.6	Cable termination, mag PS PLC rack			10.0	chan.		0.99	29.96	30	SNS_TEC	HC	IH	IN	LA	LI	36	X0	30
1.9.4.2.3.6	On-site preparation for mag PS PLC						0.4	29.96	12	SNS_TEC	EJ	IH	IN	LA	LI	14	X0	30
1.9.4.2.3.7	Testing, Mag Pwr Sup IOC, engr.			10.0	chan		5	58.48	292	LANL_TSM	EJ	IH	T3	LA	LI	512	X0	30
1.9.4.2.3.7	Testing, Mag Pwr Sup IOC, tech			10.0	chan		5	29.96	150	SNS_TEC	EJ	IH	IN	LA	LI	181	X0	30
1.9.4.2.3.7	Testing, mag PS PLC, engr.			10.0	chan		5	58.48	292	LANL_TSM	EJ	IH	T3	LA	LI	512	X0	30
1.9.4.2.3.7	Testing, mag PS PLC, tech			10.0	chan		5	29.96	150	SNS_TEC	EJ	IH	IN	LA	LI	181	X0	30
1.9.4.3	***CCDTL Control Systems***								162,294							229,314		
1.9.4.3	CCDTL			0.0			0		0							0		0
1.9.4.3.1	CCDTL Vacuum Systems			0.0			0		0							0		0
1.9.4.3.1.1	Title I&II Engineering for vac IOC						30	58.48	1,754	LANL_TSM	EJ	IH	T2	LA	LI	3,070	X0	30
1.9.4.3.1.1	Title I&II Engineering for vac PLC							58.48	0	LANL_TSM	EJ	IH	T2	LA	LI	0	X0	30
1.9.4.3.1.2	IOC hardware, for vac sys			0.8	system	14,000			10,500		CP	IH	EQ	LA	LI	12,285	X1	30
1.9.4.3.1.2	Rack, for vac IOC			0.4	ea	1,500			563		CP	IH	EQ	LA	LI	658	X1	30
1.9.4.3.1.2	Signal conditioning, for vac IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.3.1.2	PLC hardware, for vac sys			0.0	system	25,600			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.3.1.2	Rack, for vac PLC			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.3.1.3	Title III Engineering for vac IOC						30	58.48	1,754	LANL_TSM	EJ	IH	T3	LA	LI	3,070	X0	30
1.9.4.3.1.3	Matls engr & inspect for vac IOC						3	58.48	175	LANL_TSM	EJ	IH	T3	LA	LI	307	X0	30
1.9.4.3.1.3	Title III Engineering for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.3.1.3	Matls engr & inspect for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.3.1.4	Software for vac IOC			300.0	chan.		30	58.48	1,754	LANL_TSM	EJ	IH	SW	LA	LI	3,070	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.3.1.4	Software for vac PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30
1.9.4.3.1.5	Fab, config, & test of vac IOC rack, tech						15	44.01	660	LANL_TEC	EJ	IH	LA	LA	LI	1,155	X0	30
1.9.4.3.1.5	Fab of vac IOC rack, crafts						15	27.00	405	LANL_CFT	EJ	IH	LA	LA	LI	709	X0	30
1.9.4.3.1.5	Fab, config, & test of vac PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.3.1.5	Fab of vac PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.3.1.6	Installation, vac IOC rack						6	30.61	184	IND_EE	HC	FP	IN	CM	LI	189	X0	30
1.9.4.3.1.6	On-site preparation for vac IOC						6	29.96	180	SNS_TEC	EJ	IH	IN	LA	LI	217	X0	30
1.9.4.3.1.6	Installation, vac PLC rack							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.3.1.6	Cable, PLC-to-IOC & remote I/O comm.			0.0	ft.	1			0		CP	FP	MA	LA	LI	0	X1	30
1.9.4.3.1.6	Cable installation labor, comm. cable							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.3.1.6	Cable termination, vac PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.3.1.6	On-site preparation of vac PLC							29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.3.1.7	Testing, vac IOC, engr.			300.0	chan		150	58.48	8,772	LANL_TSM	EJ	IH	T3	LA	LI	15,351	X0	30
1.9.4.3.1.7	Testing, vac IOC, tech			300.0	chan		150	29.96	4,494	SNS_TEC	EJ	IH	IN	LA	LI	5,415	X0	30
1.9.4.3.1.7	Testing, vac PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.3.1.7	Testing, vac PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.3.2	CCDTL Cooling Systems			0.0			0		0							0		0
1.9.4.3.2.1	Title I&II Engineering for Cooling Sys IOC						30	58.48	1,754	LANL_TSM	EJ	IH	T2	LA	LI	3,070	X0	30
1.9.4.3.2.1	Title I&II Engineering for Cooling Sys PLC						30	58.48	1,754	LANL_TSM	EJ	IH	T2	LA	LI	3,070	X0	30
1.9.4.3.2.2	IOC hardware, for Cooling sys			0.8	system	20,000			15,000		CP	IH	EQ	LA	LI	17,550	X1	30
1.9.4.3.2.2	Rack, for Cooling Sys IOC			0.4	ea	1,500			563		CP	IH	EQ	LA	LI	658	X1	30
1.9.4.3.2.2	Signal conditioning, for Cooling Sys IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.3.2.2	PLC hardware, for Cooling sys			0.8	system	12,800			9,600		CP	IH	EQ	LA	LI	11,232	X1	30
1.9.4.3.2.2	Rack, for Cooling Sys PLC			0.8	ea	1,500			1,125		CP	IH	EQ	LA	LI	1,316	X1	30
1.9.4.3.2.3	Title III Engineering for Cooling Sys IOC						30	58.48	1,754	LANL_TSM	EJ	IH	T3	LA	LI	3,070	X0	30
1.9.4.3.2.3	Matls engr & inspect for Cooling Sys IOC						3	58.48	175	LANL_TSM	EJ	IH	T3	LA	LI	307	X0	30
1.9.4.3.2.3	Title III Engineering for Cooling Sys PLC						30	58.48	1,754	LANL_TSM	EJ	IH	T3	LA	LI	3,070	X0	30
1.9.4.3.2.3	Matls engr & inspect for Cooling Sys PLC						3	58.48	175	LANL_TSM	EJ	IH	T3	LA	LI	307	X0	30
1.9.4.3.2.4	Software for Cooling Sys IOC			63.0	chan.		30	58.48	1,754	LANL_TSM	EJ	IH	SW	LA	LI	3,070	X0	30
1.9.4.3.2.4	Software for Cooling Sys PLC			63.0	chan.		30	58.48	1,754	LANL_TSM	EJ	IH	SW	LA	LI	3,070	X0	30
1.9.4.3.2.5	Fab, config, & test of Cooling Sys IOC rack, tech						30	44.01	1,320	LANL_TEC	EJ	IH	LA	LA	LI	2,311	X0	30
1.9.4.3.2.5	Fab of Cooling Sys IOC rack, crafts						15	27.00	405	LANL_CFT	EJ	IH	LA	LA	LI	709	X0	30
1.9.4.3.2.5	Fab, config, & test of Cooling Sys PLC rack, tech						30	44.01	1,320	LANL_TEC	EJ	IH	LA	LA	LI	2,311	X0	30
1.9.4.3.2.5	Fab of Cooling Sys PLC rack, crafts						15	27.00	405	LANL_CFT	EJ	IH	LA	LA	LI	709	X0	30
1.9.4.3.2.6	Installation, Cooling Sys IOC rack						6	30.61	184	IND_EE	HC	FP	IN	CM	LI	189	X0	30
1.9.4.3.2.6	Cable termination, Cooling Sys IOC rack						3.1185	29.96	93	SNS_TEC	EJ	IH	IN	LA	LI	113	X0	30
1.9.4.3.2.6	On-site preparation for Cooling Sys IOC						6	29.96	180	SNS_TEC	EJ	IH	IN	LA	LI	217	X0	30
1.9.4.3.2.6	Installation, Cooling Sys PLC rack						6	30.61	184	IND_EE	HC	FP	IN	CM	LI	189	X0	30
1.9.4.3.2.6	Cable, PLC-to-IOC & remote I/O comm.			75.0	ft.	1			75		CP	FP	MA	LA	LI	90	X1	30
1.9.4.3.2.6	Cable installation labor						0.85725	30.61	26	IND_EE	HC	FP	IN	CM	LI	27	X0	30
1.9.4.3.2.6	Cable termination, Cooling Sys PLC rack			63.0	chan.		6.237	29.96	187	SNS_TEC	HC	IH	IN	LA	LI	225	X0	30
1.9.4.3.2.6	On-site preparation for Cooling Sys PLC						6	29.96	180	SNS_TEC	EJ	IH	IN	LA	LI	217	X0	30
1.9.4.3.2.7	Testing, Cooling Sys IOC, engr.			63.0	chan		31.5	58.48	1,842	LANL_TSM	EJ	IH	T3	LA	LI	3,224	X0	30
1.9.4.3.2.7	Testing, Cooling Sys IOC, tech			63.0	chan		31.5	29.96	944	SNS_TEC	EJ	IH	IN	LA	LI	1,137	X0	30
1.9.4.3.2.7	Testing, Cooling Sys PLC, engr.			63.0	chan		31.5	58.48	1,842	LANL_TSM	EJ	IH	T3	LA	LI	3,224	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.3.2.7	Testing, Cooling Sys PLC, tech			63.0	chan		31.5	29.96	944	SNS_TEC	EJ	IH	IN	LA	LI	1,137	X0	30
1.9.4.3.3	CCDTL Power Systems			0.0			0		0							0		0
1.9.4.3.3.1	Title I&II Engineering for Mag Pwr Sup IOC						38	58.48	2,222	LANL_TSM	EJ	IH	T2	LA	LI	3,889	X0	30
1.9.4.3.3.1	Title I&II Engineering for mag PS PLC						38	58.48	2,222	LANL_TSM	EJ	IH	T2	LA	LI	3,889	X0	30
1.9.4.3.3.2	IOC hardware, for Mag Pwr Sup Sys			1.0	system	13,310			12,645		CP	IH	EQ	LA	LI	14,794	X2	30
1.9.4.3.3.2	Rack, for Mag Pwr Sup IOC			0.5	ea	1,500			713		CP	IH	EQ	LA	LI	834	X1	30
1.9.4.3.3.2	Signal conditioning, for Mag Pwr Sup IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.3.3.2	PLC hardware, for mag PS			1.0	system	26,000			24,700		CP	IH	EQ	LA	LI	28,899	X2	30
1.9.4.3.3.2	Rack, for mag PS PLC			0.9	ea	1,500			1,425		CP	IH	EQ	LA	LI	1,667	X1	30
1.9.4.3.3.3	Title III Engineering for Mag Pwr Sup IOC						38	58.48	2,222	LANL_TSM	EJ	IH	T3	LA	LI	3,889	X0	30
1.9.4.3.3.3	Matls engr & inspect for Mag Pwr Sup IOC						3.8	58.48	222	LANL_TSM	EJ	IH	T3	LA	LI	389	X0	30
1.9.4.3.3.3	Title III Engineering for mag PS PLC						38	58.48	2,222	LANL_TSM	EJ	IH	T3	LA	LI	3,889	X0	30
1.9.4.3.3.3	Matls engr & inspect for mag PS PLC						3.8	58.48	222	LANL_TSM	EJ	IH	T3	LA	LI	389	X0	30
1.9.4.3.3.4	Software for Mag Pwr Sup IOC			284.0	chan.		38	58.48	2,222	LANL_TSM	EJ	IH	SW	LA	LI	3,889	X0	30
1.9.4.3.3.4	Software for mag PS PLC			284.0	chan.		38	58.48	2,222	LANL_TSM	EJ	IH	SW	LA	LI	3,889	X0	30
1.9.4.3.3.5	Fab, config, & test of Mag Pwr Sup IOC rack, tech						19	44.01	836	LANL_TEC	EJ	IH	LA	LA	LI	1,463	X0	30
1.9.4.3.3.5	Fab of Mag Pwr Sup IOC rack, crafts						19	27.00	513	LANL_CFT	EJ	IH	LA	LA	LI	898	X0	30
1.9.4.3.3.5	Fab, config, & test of mag PS PLC rack, tech						38	44.01	1,672	LANL_TEC	EJ	IH	LA	LA	LI	2,927	X0	30
1.9.4.3.3.5	Fab of mag PS PLC rack, crafts						19	27.00	513	LANL_CFT	EJ	IH	LA	LA	LI	898	X0	30
1.9.4.3.3.6	Installation, Mag Pwr Sup IOC rack						7.6	30.61	233	IND_EE	HC	FP	IN	CM	LI	239	X0	30
1.9.4.3.3.6	On-site preparation for Mag Pwr Sup IOC						7.6	29.96	228	SNS_TEC	EJ	IH	IN	LA	LI	274	X0	30
1.9.4.3.3.6	Installation, mag PS PLC rack						7.6	30.61	233	IND_EE	HC	FP	IN	CM	LI	239	X0	30
1.9.4.3.3.6	Cable, PLC-to-IOC & remote I/O comm.			95.0	ft.	1			95		CP	FP	MA	LA	LI	114	X1	30
1.9.4.3.3.6	Cable installation labor						1.08585	30.61	33	IND_EE	HC	FP	IN	CM	LI	34	X0	30
1.9.4.3.3.6	Cable termination, mag PS PLC rack			284.0	chan.		28.116	29.96	842	SNS_TEC	HC	IH	IN	LA	LI	1,015	X0	30
1.9.4.3.3.6	On-site preparation for mag PS PLC						7.6	29.96	228	SNS_TEC	EJ	IH	IN	LA	LI	274	X0	30
1.9.4.3.3.7	Testing, Mag Pwr Sup IOC, engr.			284.0	chan		142	58.48	8,304	LANL_TSM	EJ	IH	T3	LA	LI	14,532	X0	30
1.9.4.3.3.7	Testing, Mag Pwr Sup IOC, tech			284.0	chan		142	29.96	4,254	SNS_TEC	EJ	IH	IN	LA	LI	5,126	X0	30
1.9.4.3.3.7	Testing, mag PS PLC, engr.			284.0	chan		142	58.48	8,304	LANL_TSM	EJ	IH	T3	LA	LI	14,532	X0	30
1.9.4.3.3.7	Testing, mag PS PLC, tech			284.0	chan		142	29.96	4,254	SNS_TEC	EJ	IH	IN	LA	LI	5,126	X0	30
1.9.4.4	***CCL Control Systems***								1,151,041							1,647,551		
1.9.4.4	CCL			0.0			0		0							0		0
1.9.4.4.1	CCL Vacuum Systems			0.0			0		0							0		0
1.9.4.4.1.1	Title I&II Engineering for vac IOC						120	58.48	7,018	LANL_TSM	EJ	IH	T2	LA	LI	12,281	X0	30
1.9.4.4.1.1	Title I&II Engineering for vac PLC							58.48	0	LANL_TSM	EJ	IH	T2	LA	LI	0	X0	30
1.9.4.4.1.2	IOC hardware, for vac sys			3.0	system	14,000			42,000		CP	IH	EQ	LA	LI	49,140	X2	30
1.9.4.4.1.2	Rack, for vac IOC			1.5	ea	1,500			2,250		CP	IH	EQ	LA	LI	2,633	X1	30
1.9.4.4.1.2	Signal conditioning, for vac IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.4.1.2	PLC hardware, for vac sys			0.0	system	25,600			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.4.1.2	Rack, for vac PLC			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.4.1.3	Title III Engineering for vac IOC						120	58.48	7,018	LANL_TSM	EJ	IH	T3	LA	LI	12,281	X0	30
1.9.4.4.1.3	Matls engr & inspect for vac IOC						12	58.48	702	LANL_TSM	EJ	IH	T3	LA	LI	1,228	X0	30
1.9.4.4.1.3	Title III Engineering for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.4.1.3	Matls engr & inspect for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.4.1.4	Software for vac IOC			2,760.0	chan.		120	58.48	7,018	LANL_TSM	EJ	IH	SW	LA	LI	12,281	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.4.1.4	Software for vac PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30
1.9.4.4.1.5	Fab, config, & test of vac IOC rack, tech						60	44.01	2,641	LANL_TEC	EJ	IH	LA	LA	LI	4,621	X0	30
1.9.4.4.1.5	Fab of vac IOC rack, crafts						60	27.00	1,620	LANL_CFT	EJ	IH	LA	LA	LI	2,835	X0	30
1.9.4.4.1.5	Fab, config, & test of vac PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.4.1.5	Fab of vac PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.4.1.6	Installation, vac IOC rack						24	30.61	735	IND_EE	HC	FP	IN	CM	LI	756	X0	30
1.9.4.4.1.6	On-site preparation for vac IOC						24	29.96	719	SNS_TEC	EJ	IH	IN	LA	LI	866	X0	30
1.9.4.4.1.6	Installation, vac PLC rack							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.4.1.6	Cable, PLC-to-IOC & remote I/O comm.			0.0	ft.	1			0		CP	FP	MA	LA	LI	0	X1	30
1.9.4.4.1.6	Cable installation labor, comm. cable							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.4.1.6	Cable termination, vac PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.4.1.6	On-site preparation of vac PLC							29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.4.1.7	Testing, vac IOC, engr.			2,760.0	chan		1380	58.48	80,702	LANL_TSM	EJ	IH	T3	LA	LI	141,229	X0	30
1.9.4.4.1.7	Testing, vac IOC, tech			2,760.0	chan		1380	29.96	41,345	SNS_TEC	EJ	IH	IN	LA	LI	49,820	X0	30
1.9.4.4.1.7	Testing, vac PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.4.1.7	Testing, vac PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.4.2	CCL Cooling Systems			0.0			0		0							0		0
1.9.4.4.2.1	Title I&II Engineering for Cooling Sys IOC						120	58.48	7,018	LANL_TSM	EJ	IH	T2	LA	LI	12,281	X0	30
1.9.4.4.2.1	Title I&II Engineering for Cooling Sys PLC						240	58.48	14,035	LANL_TSM	EJ	IH	T2	LA	LI	24,562	X0	30
1.9.4.4.2.2	IOC hardware, for Cooling sys			3.0	system	20,000			60,000		CP	IH	EQ	LA	LI	70,200	X2	30
1.9.4.4.2.2	Rack, for Cooling Sys IOC			1.5	ea	1,500			2,250		CP	IH	EQ	LA	LI	2,633	X1	30
1.9.4.4.2.2	Signal conditioning, for Cooling Sys IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.4.2.2	PLC hardware, for Cooling sys			6.0	system	12,800			76,800		CP	IH	EQ	LA	LI	89,856	X2	30
1.9.4.4.2.2	Rack, for Cooling Sys PLC			6.0	ea	1,500			9,000		CP	IH	EQ	LA	LI	10,530	X1	30
1.9.4.4.2.3	Title III Engineering for Cooling Sys IOC						120	58.48	7,018	LANL_TSM	EJ	IH	T3	LA	LI	12,281	X0	30
1.9.4.4.2.3	Matls engr & inspect for Cooling Sys IOC						12	58.48	702	LANL_TSM	EJ	IH	T3	LA	LI	1,228	X0	30
1.9.4.4.2.3	Title III Engineering for Cooling Sys PLC						240	58.48	14,035	LANL_TSM	EJ	IH	T3	LA	LI	24,562	X0	30
1.9.4.4.2.3	Matls engr & inspect for Cooling Sys PLC						24	58.48	1,404	LANL_TSM	EJ	IH	T3	LA	LI	2,456	X0	30
1.9.4.4.2.4	Software for Cooling Sys IOC			800.0	chan.		120	58.48	7,018	LANL_TSM	EJ	IH	SW	LA	LI	12,281	X0	30
1.9.4.4.2.4	Software for Cooling Sys PLC			800.0	chan.		240	58.48	14,035	LANL_TSM	EJ	IH	SW	LA	LI	24,562	X0	30
1.9.4.4.2.5	Fab, config, & test of Cooling Sys IOC rack, tech						120	44.01	5,281	LANL_TEC	EJ	IH	LA	LA	LI	9,242	X0	30
1.9.4.4.2.5	Fab of Cooling Sys IOC rack, crafts						60	27.00	1,620	LANL_CFT	EJ	IH	LA	LA	LI	2,835	X0	30
1.9.4.4.2.5	Fab, config, & test of Cooling Sys PLC rack, tech						240	44.01	10,562	LANL_TEC	EJ	IH	LA	LA	LI	18,484	X0	30
1.9.4.4.2.5	Fab of Cooling Sys PLC rack, crafts						120	27.00	3,240	LANL_CFT	EJ	IH	LA	LA	LI	5,670	X0	30
1.9.4.4.2.6	Installation, Cooling Sys IOC rack						24	30.61	735	IND_EE	HC	FP	IN	CM	LI	756	X0	30
1.9.4.4.2.6	Cable termination, Cooling Sys IOC rack						39.6	29.96	1,186	SNS_TEC	EJ	IH	IN	LA	LI	1,430	X0	30
1.9.4.4.2.6	On-site preparation for Cooling Sys IOC						24	29.96	719	SNS_TEC	EJ	IH	IN	LA	LI	866	X0	30
1.9.4.4.2.6	Installation, Cooling Sys PLC rack						48	30.61	1,469	IND_EE	HC	FP	IN	CM	LI	1,512	X0	30
1.9.4.4.2.6	Cable, PLC-to-IOC & remote I/O comm.			600.0	ft.	1			600		CP	FP	MA	LA	LI	720	X1	30
1.9.4.4.2.6	Cable installation labor						6.858	30.61	210	IND_EE	HC	FP	IN	CM	LI	216	X0	30
1.9.4.4.2.6	Cable termination, Cooling Sys PLC rack			800.0	chan.		79.2	29.96	2,373	SNS_TEC	HC	IH	IN	LA	LI	2,859	X0	30
1.9.4.4.2.6	On-site preparation for Cooling Sys PLC						48	29.96	1,438	SNS_TEC	EJ	IH	IN	LA	LI	1,733	X0	30
1.9.4.4.2.7	Testing, Cooling Sys IOC, engr.			800.0	chan		400	58.48	23,392	LANL_TSM	EJ	IH	T3	LA	LI	40,936	X0	30
1.9.4.4.2.7	Testing, Cooling Sys IOC, tech			800.0	chan		400	29.96	11,984	SNS_TEC	EJ	IH	IN	LA	LI	14,441	X0	30
1.9.4.4.2.7	Testing, Cooling Sys PLC, engr.			800.0	chan		400	58.48	23,392	LANL_TSM	EJ	IH	T3	LA	LI	40,936	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.4.2.7	Testing, Cooling Sys PLC, tech			800.0	chan		400	29.96	11,984	SNS_TEC	EJ	IH	IN	LA	LI	14,441	X0	30
1.9.4.4.3	CCL Power Systems			0.0			0		0							0		0
1.9.4.4.3.1	Title I&II Engineering for Mag Pwr Sup IOC						160	58.48	9,357	LANL_TSM	EJ	IH	T2	LA	LI	16,374	X0	30
1.9.4.4.3.1	Title I&II Engineering for mag PS PLC						320	58.48	18,714	LANL_TSM	EJ	IH	T2	LA	LI	32,749	X0	30
1.9.4.4.3.2	IOC hardware, for Mag Pwr Sup Sys			4.0	system	13,310			53,240		CP	IH	EQ	LA	LI	62,291	X2	30
1.9.4.4.3.2	Rack, for Mag Pwr Sup IOC			2.0	ea	1,500			3,000		CP	IH	EQ	LA	LI	3,510	X1	30
1.9.4.4.3.2	Signal conditioning, for Mag Pwr Sup IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.4.3.2	PLC hardware, for mag PS			8.0	system	26,000			208,000		CP	IH	EQ	LA	LI	243,360	X2	30
1.9.4.4.3.2	Rack, for mag PS PLC			8.0	ea	1,500			12,000		CP	IH	EQ	LA	LI	14,040	X1	30
1.9.4.4.3.3	Title III Engineering for Mag Pwr Sup IOC						160	58.48	9,357	LANL_TSM	EJ	IH	T3	LA	LI	16,374	X0	30
1.9.4.4.3.3	Matls engr & inspect for Mag Pwr Sup IOC						16	58.48	936	LANL_TSM	EJ	IH	T3	LA	LI	1,637	X0	30
1.9.4.4.3.3	Title III Engineering for mag PS PLC						320	58.48	18,714	LANL_TSM	EJ	IH	T3	LA	LI	32,749	X0	30
1.9.4.4.3.3	Matls engr & inspect for mag PS PLC						32	58.48	1,871	LANL_TSM	EJ	IH	T3	LA	LI	3,275	X0	30
1.9.4.4.3.4	Software for Mag Pwr Sup IOC			2,730.0	chan.		160	58.48	9,357	LANL_TSM	EJ	IH	SW	LA	LI	16,374	X0	30
1.9.4.4.3.4	Software for mag PS PLC			2,730.0	chan.		320	58.48	18,714	LANL_TSM	EJ	IH	SW	LA	LI	32,749	X0	30
1.9.4.4.3.5	Fab, config, & test of Mag Pwr Sup IOC rack, tech						80	44.01	3,521	LANL_TEC	EJ	IH	LA	LA	LI	6,161	X0	30
1.9.4.4.3.5	Fab of Mag Pwr Sup IOC rack, crafts						80	27.00	2,160	LANL_CFT	EJ	IH	LA	LA	LI	3,780	X0	30
1.9.4.4.3.5	Fab, config, & test of mag PS PLC rack, tech						320	44.01	14,083	LANL_TEC	EJ	IH	LA	LA	LI	24,646	X0	30
1.9.4.4.3.5	Fab of mag PS PLC rack, crafts						160	27.00	4,320	LANL_CFT	EJ	IH	LA	LA	LI	7,560	X0	30
1.9.4.4.3.6	Installation, Mag Pwr Sup IOC rack						32	30.61	980	IND_EE	HC	FP	IN	CM	LI	1,008	X0	30
1.9.4.4.3.6	On-site preparation for Mag Pwr Sup IOC						32	29.96	959	SNS_TEC	EJ	IH	IN	LA	LI	1,155	X0	30
1.9.4.4.3.6	Installation, mag PS PLC rack						64	30.61	1,959	IND_EE	HC	FP	IN	CM	LI	2,017	X0	30
1.9.4.4.3.6	Cable, PLC-to-IOC & remote I/O comm.			800.0	ft.	1			800		CP	FP	MA	LA	LI	960	X1	30
1.9.4.4.3.6	Cable installation labor						9.144	30.61	280	IND_EE	HC	FP	IN	CM	LI	288	X0	30
1.9.4.4.3.6	Cable termination, mag PS PLC rack			2,730.0	chan.		270.27	29.96	8,097	SNS_TEC	HC	IH	IN	LA	LI	9,757	X0	30
1.9.4.4.3.6	On-site preparation for mag PS PLC						64	29.96	1,917	SNS_TEC	EJ	IH	IN	LA	LI	2,311	X0	30
1.9.4.4.3.7	Testing, Mag Pwr Sup IOC, engr.			2,730.0	chan		1365	58.48	79,825	LANL_TSM	EJ	IH	T3	LA	LI	139,694	X0	30
1.9.4.4.3.7	Testing, Mag Pwr Sup IOC, tech			2,730.0	chan		1365	29.96	40,895	SNS_TEC	EJ	IH	IN	LA	LI	49,279	X0	30
1.9.4.4.3.7	Testing, mag PS PLC, engr.			2,730.0	chan		1365	58.48	79,825	LANL_TSM	EJ	IH	T3	LA	LI	139,694	X0	30
1.9.4.4.3.7	Testing, mag PS PLC, tech			2,730.0	chan		1365	29.96	40,895	SNS_TEC	EJ	IH	IN	LA	LI	49,279	X0	30
1.9.4.5	***Control Systems for Other Systems***								1,559,739							2,261,614		
1.9.4.5	Diagnostics			0.0			0		0							0		0
1.9.4.5.1	Diagnostics			0.0			0		0							0		0
1.9.4.5.1.1	Title I&II Engineering for diagnostic IOC						2200	58.48	128,656	LANL_TSM	EJ	IH	T2	LA	LI	225,148	X0	30
1.9.4.5.1.2	IOC hardware, for diagnostic sys			55.0	system	11,908			654,940		CP	IH	EQ	LA	LI	766,280	X2	30
1.9.4.5.1.2	Rack, for diagnostic IOC			27.5	ea	1,500			41,250		CP	IH	EQ	LA	LI	48,263	X1	30
1.9.4.5.1.2	Signal conditioning, for diagnostic IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.5.1.3	Title III Engineering for diagnostic IOC						2200	58.48	128,656	LANL_TSM	EJ	IH	T3	LA	LI	225,148	X0	30
1.9.4.5.1.3	Matls engr & inspect for diagnostic IOC						220	58.48	12,866	LANL_TSM	EJ	IH	T3	LA	LI	22,515	X0	30
1.9.4.5.1.4	Software for diagnostic IOC			1,555.0	chan.		4400	58.48	257,312	LANL_TSM	EJ	IH	SW	LA	LI	450,296	X0	30
1.9.4.5.1.5	Fab, config, & test of diagnostic IOC rack, tech						1100	44.01	48,411	LANL_TEC	EJ	IH	LA	LA	LI	84,719	X0	30
1.9.4.5.1.5	Fab of diagnostic IOC rack, crafts						1100	27.00	29,700	LANL_CFT	EJ	IH	LA	LA	LI	51,975	X0	30
1.9.4.5.1.6	Installation, diagnostic IOC rack						440	30.61	13,468	IND_EE	HC	FP	IN	CM	LI	13,864	X0	30
1.9.4.5.1.6	On-site preparation for diagnostic IOC						440	29.96	13,182	SNS_TEC	EJ	IH	IN	LA	LI	15,885	X0	30
1.9.4.5.1.7	Testing, diagnostic IOC, engr.			1,555.0	chan		1555	58.48	90,936	LANL_TSM	EJ	IH	T3	LA	LI	159,139	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.5.1.7	Testing, diagnostic IOC, tech			1,555.0	chan		1555	29.96	46,588	SNS_TEC	EJ	IH	IN	LA	LI	56,138	X0	30
1.9.4.5.2	Chopper			0.0			0		0							0		0
1.9.4.5.2.1	Title I&II Engineering for chopper IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T2	LA	LI	4,094	X0	30
1.9.4.5.2.2	IOC hardware, for chopper sys			1.0	system	35,000			35,000		CP	IH	EQ	LA	LI	40,950	X2	30
1.9.4.5.2.2	Rack, for chopper IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.5.2.2	Signal conditioning, for chopper IOC			0.0			0		0				EQ	LA	LI	0	X1	30
1.9.4.5.2.3	Title III Engineering for chopper IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.5.2.3	Matls engr & inspect for chopper IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.5.2.4	Software for chopper IOC			100.0	chan.		800	58.48	46,784	LANL_TSM	EJ	IH	SW	LA	LI	81,872	X0	30
1.9.4.5.2.5	Fab, config, & test of chopper IOC rack, tech						20	44.01	880	LANL_TEC	EJ	IH	LA	LA	LI	1,540	X0	30
1.9.4.5.2.5	Fab of chopper IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.5.2.6	Installation, chopper IOC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.5.2.6	On-site preparation for chopper IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.5.2.7	Testing, chopper IOC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.5.2.7	Testing, chopper IOC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.6	***Control Sys for Linac RF Power Sys***								2,493,803							3,668,012		
1.9.4.6	RF Systems			0.0			0		0							0		0
1.9.4.6.1	LLRF Systems			0.0			0		0							0		0
1.9.4.6.1.1	Title I&II Engineering for LLRF IOC						1360	58.48	79,533	LANL_TSM	EJ	IH	T2	LA	LI	139,182	X0	30
1.9.4.6.1.2	IOC hardware, for LLRF sys			34.0	system	11,908			404,872		CP	IH	EQ	LA	LI	473,700	X2	30
1.9.4.6.1.2	Rack, for LLRF IOC			17.0	ea	1,500			25,500		CP	IH	EQ	LA	LI	29,835	X1	30
1.9.4.6.1.2	Signal conditioning, for LLRF IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.6.1.3	Title III Engineering for LLRF IOC						1360	58.48	79,533	LANL_TSM	EJ	IH	T3	LA	LI	139,182	X0	30
1.9.4.6.1.3	Matls engr & inspect for LLRF IOC						136	58.48	7,953	LANL_TSM	EJ	IH	T3	LA	LI	13,918	X0	30
1.9.4.6.1.4	Software for LLRF IOC			10,500.0	chan.		2720	58.48	159,066	LANL_TSM	EJ	IH	SW	LA	LI	278,365	X0	30
1.9.4.6.1.5	Fab, config, & test of LLRF IOC rack, tech						680	44.01	29,927	LANL_TEC	EJ	IH	LA	LA	LI	52,372	X0	30
1.9.4.6.1.5	Fab of LLRF IOC rack, crafts						680	27.00	18,360	LANL_CFT	EJ	IH	LA	LA	LI	32,130	X0	30
1.9.4.6.1.6	Installation, LLRF IOC rack						272	30.61	8,326	IND_EE	HC	FP	IN	CM	LI	8,571	X0	30
1.9.4.6.1.6	On-site preparation for LLRF IOC						272	29.96	8,149	SNS_TEC	EJ	IH	IN	LA	LI	9,820	X0	30
1.9.4.6.1.7	Testing, LLRF IOC, engr.			10,500.0	chan		5250	58.48	307,020	LANL_TSM	EJ	IH	T3	LA	LI	537,285	X0	30
1.9.4.6.1.7	Testing, LLRF IOC, tech			10,500.0	chan		5250	29.96	157,290	SNS_TEC	EJ	IH	IN	LA	LI	189,534	X0	30
1.9.4.6.2	HPRF Systems			0.0			0		0							0		0
1.9.4.6.2.1	Title I&II Engineering for HPRF IOC						1360	58.48	79,533	LANL_TSM	EJ	IH	T2	LA	LI	139,182	X0	30
1.9.4.6.2.1	Title I&II Engineering for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T2	LA	LI	0	X0	30
1.9.4.6.2.2	IOC hardware, for HPRF sys			34.0	system	13,310			452,540		CP	IH	EQ	LA	LI	529,472	X2	30
1.9.4.6.2.2	Rack, for HPRF IOC			17.0	ea	1,500			25,500		CP	IH	EQ	LA	LI	29,835	X1	30
1.9.4.6.2.2	Signal conditioning, for HPRF IOC			0.0			0		0				EQ	LA	LI	0	X1	30
1.9.4.6.2.2	PLC hardware, for HPRF			0.0	system	12,100			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.6.2.2	Rack, for HPRF PLC			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.6.2.3	Title III Engineering for HPRF IOC						1360	58.48	79,533	LANL_TSM	EJ	IH	T3	LA	LI	139,182	X0	30
1.9.4.6.2.3	Matls engr & inspect for HPRF IOC						136	58.48	7,953	LANL_TSM	EJ	IH	T3	LA	LI	13,918	X0	30
1.9.4.6.2.3	Title III Engineering for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.6.2.3	Matls engr & inspect for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.6.2.4	Software for HPRF IOC			7,675.0	chan.		2720	58.48	159,066	LANL_TSM	EJ	IH	SW	LA	LI	278,365	X0	30
1.9.4.6.2.4	Software for HPRF PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.6.2.5	Fab, config, & test of HPRF IOC rack, tech						680	44.01	29,927	LANL_TEC	EJ	IH	LA	LA	LI	52,372	X0	30
1.9.4.6.2.5	Fab of HPRF IOC rack, crafts						680	27.00	18,360	LANL_CFT	EJ	IH	LA	LA	LI	32,130	X0	30
1.9.4.6.2.5	Fab, config, & test of HPRF PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.6.2.5	Fab of HPRF PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.6.2.6	Installation, HPRF IOC rack						272	30.61	8,326	IND_EE	HC	FP	IN	CM	LI	8,571	X0	30
1.9.4.6.2.6	On-site preparation for HPRF IOC						272	29.96	8,149	SNS_TEC	EJ	IH	IN	LA	LI	9,820	X0	30
1.9.4.6.2.6	Installation, HPRF PLC rack							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.6.2.6	Cable, PLC-to-IOC & remote I/O comm.			0.0	ft.	1			0		CP	FP	MA	LA	LI	0	X1	30
1.9.4.6.2.6	Cable installation labor							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.6.2.6	Cable termination, HPRF PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.6.2.6	On-site preparation for HPRF PLC							29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.6.2.7	Testing, HPRF IOC, engr.			7,675.0	chan		3837.5	58.48	224,417	LANL_TSM	EJ	IH	T3	LA	LI	392,730	X0	30
1.9.4.6.2.7	Testing, HPRF IOC, tech			7,675.0	chan		3837.5	29.96	114,972	SNS_TEC	EJ	IH	IN	LA	LI	138,541	X0	30
1.9.4.6.2.7	Testing, HPRF PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.6.2.7	Testing, HPRF PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.7	***Standard System Design***								1,949,222							3,304,520		
1.9.4.7	Standard System Design (Non-recurring Costs)			0.0			0		0							0		0
1.9.4.7.1	Standard Vacuum System Controls			0.0			0		0							0		0
1.9.4.7.1.1	Title I&II Engineering for std vac IOC						200	58.48	11,696	LANL_TSM	EJ	IH	T2	LA	LI	20,468	X0	30
1.9.4.7.1.1	Title I&II Engineering for std vac PLC						320	58.48	18,714	LANL_TSM	EJ	IH	T2	LA	LI	32,749	X0	30
1.9.4.7.1.2	IOC hardware, for vac sys			1.0	system	13,310			13,310		CP	IH	EQ	LA	LI	15,573	X2	30
1.9.4.7.1.2	Rack, for vac IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.7.1.2	Signal conditioning, for vac IOC			0.0			0		0				EQ	LA	LI	0	X1	30
1.9.4.7.1.2	PLC hardware, for vac sys			0.0	system	15,000			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.7.1.2	Rack, for vac PLC			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.7.1.3	Title III Engineering for vac IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.1.3	Matls engr & inspect for vac IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.1.3	Title III Engineering for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.1.3	Matls engr & inspect for vac PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.1.4	Software for vac IOC			100.0	chan.		1760	58.48	102,925	LANL_TSM	EJ	IH	SW	LA	LI	180,118	X0	30
1.9.4.7.1.4	Software for vac PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30
1.9.4.7.1.5	Fab, config, & test of vac IOC rack, tech						40	44.01	1,760	LANL_TEC	EJ	IH	LA	LA	LI	3,081	X0	30
1.9.4.7.1.5	Fab of vac IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.1.5	Fab, config, & test of vac PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.7.1.5	Fab of vac PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.7.1.6	Installation, vac IOC rack						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30
1.9.4.7.1.6	On-site preparation for vac IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.1.6	On-site preparation for vac PLC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.1.6	Installation, vac PLC rack							30.61	0	IND_EE	HC	IH	IN	CM	LI	0	X0	30
1.9.4.7.1.6	Cable termination, vac PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.7.1.7	Testing, vac IOC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.7.1.7	Testing, vac IOC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.7.1.7	Testing, vac PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.1.7	Testing, vac PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.7.2	Standard Cooling System Controls			0.0			0		0							0		0

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.7.2.1	Title I&II Engineering for Cooling Sys IOC						200	58.48	11,696	LANL_TSM	EJ	IH	T2	LA	LI	20,468	X0	30
1.9.4.7.2.1	Title I&II Engineering for Cooling Sys PLC						320	58.48	18,714	LANL_TSM	EJ	IH	T2	LA	LI	32,749	X0	30
1.9.4.7.2.2	IOC hardware, for Cooling sys			1.0	system	20,000			20,000		CP	IH	EQ	LA	LI	23,400	X2	30
1.9.4.7.2.2	Rack, for Cooling Sys IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.7.2.2	Signal conditioning, for Cooling Sys IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.7.2.2	PLC hardware, for Cooling sys			1.0	system	12,800			12,800		CP	IH	EQ	LA	LI	14,976	X2	30
1.9.4.7.2.2	Rack, for Cooling Sys PLC			1.0	ea	1,500			1,500		CP	IH	EQ	LA	LI	1,755	X1	30
1.9.4.7.2.3	Title III Engineering for Cooling Sys IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.2.3	Matls engr & inspect for Cooling Sys IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.2.3	Title III Engineering for Cooling Sys PLC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.2.3	Matls engr & inspect for Cooling Sys PLC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.2.4	Software for Cooling Sys IOC			100.0	chan.		1760	58.48	102,925	LANL_TSM	EJ	IH	SW	LA	LI	180,118	X0	30
1.9.4.7.2.4	Software for Cooling Sys PLC			100.0	chan.		100	58.48	5,848	LANL_TSM	EJ	IH	SW	LA	LI	10,234	X0	30
1.9.4.7.2.5	Fab, config, & test of Cooling Sys IOC rack, tech						40	44.01	1,760	LANL_TEC	EJ	IH	LA	LA	LI	3,081	X0	30
1.9.4.7.2.5	Fab of Cooling Sys IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.2.5	Fab, config, & test of Cooling Sys PLC rack, tech						40	44.01	1,760	LANL_TEC	EJ	IH	LA	LA	LI	3,081	X0	30
1.9.4.7.2.5	Fab of Cooling Sys PLC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.2.6	Installation, Cooling Sys IOC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.2.6	Cable termination, Cooling Sys IOC rack						4.95	29.96	148	SNS_TEC	EJ	IH	IN	LA	LI	179	X0	30
1.9.4.7.2.6	On-site preparation for Cooling Sys IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.2.6	Installation, Cooling Sys PLC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.2.6	Cable termination, Cooling Sys PLC rack			100.0	chan.		9.9	29.96	297	SNS_TEC	HC	IH	IN	LA	LI	357	X0	30
1.9.4.7.2.6	On-site preparation for Cooling Sys PLC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.2.7	Testing, Cooling Sys IOC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.7.2.7	Testing, Cooling Sys IOC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.7.2.7	Testing, Cooling Sys PLC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.7.2.7	Testing, Cooling Sys PLC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.7.3	Standard Power System Controls			0.0			0		0							0		0
1.9.4.7.3.1	Title I&II Engineering for Mag Pwr Sup IOC						800	58.48	46,784	LANL_TSM	EJ	IH	T2	LA	LI	81,872	X0	30
1.9.4.7.3.1	Title I&II Engineering for mag PS PLC						320	58.48	18,714	LANL_TSM	EJ	IH	T2	LA	LI	32,749	X0	30
1.9.4.7.3.2	IOC hardware, for Mag Pwr Sup Sys			1.0	system	13,310			13,310		CP	IH	EQ	LA	LI	15,573	X1	30
1.9.4.7.3.2	Rack, for Mag Pwr Sup IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.7.3.2	Signal conditioning, for Mag Pwr Sup IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.7.3.2	PLC hardware, for mag PS			1.0	system	15,000			15,000		CP	IH	EQ	LA	LI	17,550	X1	30
1.9.4.7.3.2	Rack, for mag PS PLC			1.0	ea	1,500			1,500		CP	IH	EQ	LA	LI	1,755	X1	30
1.9.4.7.3.3	Title III Engineering for Mag Pwr Sup IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.3.3	Matls engr & inspect for Mag Pwr Sup IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.3.3	Title III Engineering for mag PS PLC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.3.3	Matls engr & inspect for mag PS PLC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.3.4	Software for Mag Pwr Sup IOC			100.0	chan.		1760	58.48	102,925	LANL_TSM	EJ	IH	SW	LA	LI	180,118	X0	30
1.9.4.7.3.4	Software for mag PS PLC			100.0	chan.		880	58.48	51,462	LANL_TSM	EJ	IH	SW	LA	LI	90,059	X0	30
1.9.4.7.3.5	Fab, config, & test of Mag Pwr Sup IOC rack, tech						20	44.01	880	LANL_TEC	EJ	IH	LA	LA	LI	1,540	X0	30
1.9.4.7.3.5	Fab of Mag Pwr Sup IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.3.5	Fab, config, & test of mag PS PLC rack, tech						40	44.01	1,760	LANL_TEC	EJ	IH	LA	LA	LI	3,081	X0	30
1.9.4.7.3.5	Fab of mag PS PLC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.7.3.6	Installation, Mag Pwr Sup IOC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.3.6	On-site preparation for Mag Pwr Sup IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.3.6	Installation, mag PS PLC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.3.6	Cable termination, mag PS PLC rack			100.0	chan.		9.9	29.96	297	SNS_TEC	HC	IH	IN	LA	LI	357	X0	30
1.9.4.7.3.6	On-site preparation for mag PS PLC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.3.7	Testing, Mag Pwr Sup IOC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.7.3.7	Testing, Mag Pwr Sup IOC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.7.3.7	Testing, mag PS PLC, engr.			100.0	chan		50	58.48	2,924	LANL_TSM	EJ	IH	T3	LA	LI	5,117	X0	30
1.9.4.7.3.7	Testing, mag PS PLC, tech			100.0	chan		50	29.96	1,498	SNS_TEC	EJ	IH	IN	LA	LI	1,805	X0	30
1.9.4.7.4	Standard Diagnostics Interfaces			0.0			0		0							0		0
1.9.4.7.4.1	Title I&II Engineering for diagnostic IOC						400	58.48	23,392	LANL_TSM	EJ	IH	T2	LA	LI	40,936	X0	30
1.9.4.7.4.2	IOC hardware, for diagnostic sys			3.0	system	17,000			51,000		CP	IH	EQ	LA	LI	59,670	X2	30
1.9.4.7.4.2	Rack, for diagnostic IOC			1.5	ea	1,500			2,250		CP	IH	EQ	LA	LI	2,633	X1	30
1.9.4.7.4.2	Signal conditioning, for diagnostic IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.7.4.3	Title III Engineering for diagnostic IOC						120	58.48	7,018	LANL_TSM	EJ	IH	T3	LA	LI	12,281	X0	30
1.9.4.7.4.3	Matls engr & inspect for diagnostic IOC						12	58.48	702	LANL_TSM	EJ	IH	T3	LA	LI	1,228	X0	30
1.9.4.7.4.4	Software for diagnostic IOC			90.0	chan.		7040	58.48	411,699	LANL_TSM	EJ	IH	SW	LA	LI	720,474	X0	30
1.9.4.7.4.5	Fab, config, & test of diagnostic IOC rack, tech						60	44.01	2,641	LANL_TEC	EJ	IH	LA	LA	LI	4,621	X0	30
1.9.4.7.4.5	Fab of diagnostic IOC rack, crafts						60	27.00	1,620	LANL_CFT	EJ	IH	LA	LA	LI	2,835	X0	30
1.9.4.7.4.6	Installation, diagnostic IOC rack						24	30.61	735	IND_EE	HC	FP	IN	CM	LI	756	X0	30
1.9.4.7.4.6	On-site preparation for diagnostic IOC						24	29.96	719	SNS_TEC	EJ	IH	IN	LA	LI	866	X0	30
1.9.4.7.4.7	Testing, diagnostic IOC, engr.			90.0	chan		45	58.48	2,632	LANL_TSM	EJ	IH	T3	LA	LI	4,605	X0	30
1.9.4.7.4.7	Testing, diagnostic IOC, tech			90.0	chan		45	29.96	1,348	SNS_TEC	EJ	IH	IN	LA	LI	1,625	X0	30
1.9.4.7.5	Standard LLRF System Controls			0.0			0		0							0		0
1.9.4.7.5.1	Title I&II Engineering for LLRF IOC						400	58.48	23,392	LANL_TSM	EJ	IH	T2	LA	LI	40,936	X0	30
1.9.4.7.5.2	IOC hardware, for LLRF sys			1.0	system	17,000			17,000		CP	IH	EQ	LA	LI	19,890	X2	30
1.9.4.7.5.2	Rack, for LLRF IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.7.5.2	Signal conditioning, for LLRF IOC			0.0			0		0		EJ	IH	EQ	LA	LI	0	X1	30
1.9.4.7.5.3	Title III Engineering for LLRF IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.5.3	Matls engr & inspect for LLRF IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.5.4	Software for LLRF IOC			150.0	chan.		7040	58.48	411,699	LANL_TSM	EJ	IH	SW	LA	LI	720,474	X0	30
1.9.4.7.5.5	Fab, config, & test of LLRF IOC rack, tech						20	44.01	880	LANL_TEC	EJ	IH	LA	LA	LI	1,540	X0	30
1.9.4.7.5.5	Fab of LLRF IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.5.6	Installation, LLRF IOC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.5.6	On-site preparation for LLRF IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.5.7	Testing, LLRF IOC, engr.			150.0	chan		75	58.48	4,386	LANL_TSM	EJ	IH	T3	LA	LI	7,676	X0	30
1.9.4.7.5.7	Testing, LLRF IOC, tech			150.0	chan		75	29.96	2,247	SNS_TEC	EJ	IH	IN	LA	LI	2,708	X0	30
1.9.4.7.6	Standard HPRF System Controls			0.0			0		0							0		0
1.9.4.7.6.1	Title I&II Engineering for HPRF IOC						400	58.48	23,392	LANL_TSM	EJ	IH	T2	LA	LI	40,936	X0	30
1.9.4.7.6.1	Title I&II Engineering for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T2	LA	LI	0	X0	30
1.9.4.7.6.2	PLC hardware, for HPRF			0.0	system	12,100			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.7.6.2	Rack, for HPRF PLC			0.0	ea	1,500			0		CP	IH	EQ	LA	LI	0	X1	30
1.9.4.7.6.2	IOC hardware, for HPRF sys			1.0	system	13,310			13,310		CP	IH	EQ	LA	LI	15,573	X2	30
1.9.4.7.6.2	Rack, for HPRF IOC			0.5	ea	1,500			750		CP	IH	EQ	LA	LI	878	X1	30
1.9.4.7.6.2	Signal conditioning, for HPRF IOC			0.0			0		0				EQ	LA	LI	0	X1	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.4.7.6.3	Matls engr & inspect for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.6.3	Title III Engineering for HPRF IOC						40	58.48	2,339	LANL_TSM	EJ	IH	T3	LA	LI	4,094	X0	30
1.9.4.7.6.3	Matls engr & inspect for HPRF IOC						4	58.48	234	LANL_TSM	EJ	IH	T3	LA	LI	409	X0	30
1.9.4.7.6.3	Title III Engineering for HPRF PLC							58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.6.4	Software for HPRF IOC			175.0	chan.		5280	58.48	308,774	LANL_TSM	EJ	IH	SW	LA	LI	540,355	X0	30
1.9.4.7.6.4	Software for HPRF PLC			0.0	chan.		0	58.48	0	LANL_TSM	EJ	IH	SW	LA	LI	0	X0	30
1.9.4.7.6.5	Fab, config, & test of HPRF IOC rack, tech						20	44.01	880	LANL_TEC	EJ	IH	LA	LA	LI	1,540	X0	30
1.9.4.7.6.5	Fab of HPRF IOC rack, crafts						20	27.00	540	LANL_CFT	EJ	IH	LA	LA	LI	945	X0	30
1.9.4.7.6.5	Fab, config, & test of HPRF PLC rack, tech							44.01	0	LANL_TEC	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.7.6.5	Fab of HPRF PLC rack, crafts							27.00	0	LANL_CFT	EJ	IH	LA	LA	LI	0	X0	30
1.9.4.7.6.6	Installation, HPRF IOC rack						8	30.61	245	IND_EE	HC	FP	IN	CM	LI	252	X0	30
1.9.4.7.6.6	On-site preparation for HPRF IOC						8	29.96	240	SNS_TEC	EJ	IH	IN	LA	LI	289	X0	30
1.9.4.7.6.6	Installation, HPRF PLC rack							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.7.6.6	Cable, PLC-to-IOC & remote I/O comm.			0.0	ft.	1			0		CP	FP	MA	LA	LI	0	X1	30
1.9.4.7.6.6	Cable installation labor							30.61	0	IND_EE	HC	FP	IN	CM	LI	0	X0	30
1.9.4.7.6.6	Cable termination, HPRF PLC rack			0.0	chan.		0	29.96	0	SNS_TEC	HC	IH	IN	LA	LI	0	X0	30
1.9.4.7.6.6	On-site preparation for HPRF PLC							29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.4.7.6.7	Testing, HPRF IOC, engr.			175.0	chan		87.5	58.48	5,117	LANL_TSM	EJ	IH	T3	LA	LI	8,955	X0	30
1.9.4.7.6.7	Testing, HPRF IOC, tech			175.0	chan		87.5	29.96	2,622	SNS_TEC	EJ	IH	IN	LA	LI	3,159	X0	30
1.9.4.7.6.7	Testing, HPRF PLC, engr.			0.0	chan		0	58.48	0	LANL_TSM	EJ	IH	T3	LA	LI	0	X0	30
1.9.4.7.6.7	Testing, HPRF PLC, tech			0.0	chan		0	29.96	0	SNS_TEC	EJ	IH	IN	LA	LI	0	X0	30
1.9.5	***Ring Control Systems***								9,291,013							11,794,962		
1.9.5.1	Integration	1	2,221,864	0.0		0	0	0.00	0							0		0
1.9.5.1	***Ring Control Systems Integration***								2,221,864							2,821,768		
1.9.5.1	Technician 2						320	49.43	15,818	T5	HC	IH	LA	BN	LI	20,089	X0	20
1.9.5.1	Engineer						320	59.66	19,091	E1	HC	IH	LA	BN	LI	24,245	X0	20
1.9.5.1	Technician 2						705	49.43	34,849	T5	HC	IH	LA	BN	LI	44,259	X0	20
1.9.5.1	Technician 2						720	49.43	35,591	T5	HC	SC	LA	BN	LI	45,200	X0	35
1.9.5.1	Pack & Ship			1.0	Lot	13,500			13,500		EJ	SC	MA	BN	LI	17,145	X0	35
1.9.5.1	PLC Software			3.0		5,000			15,000		CP	SC	MA	BN	LI	19,050	X1	15
1.9.5.1	Workstations			6.0		12,000			72,000		CP	SC	MA	BN	LI	91,440	X1	20
1.9.5.1	Travel			1.0	Lot	426,600			426,600		HC	SC	MA	BN	LI	541,782	X0	20
1.9.5.1	Workstations			7.0		8,000			56,000		AC	SC	MA	BN	LI	71,120	X1	20
1.9.5.1	Local Printers			5.0		500			2,500		CP	SC	MA	BN	LI	3,175	X1	20
1.9.5.1	System Printers			3.0		3,000			9,000		AC	SC	MA	BN	LI	11,430	X2	15
1.9.5.1	Development PCs			4.0		2,400			9,600		CP	SC	MA	BN	LI	12,192	X3	25
1.9.5.1	Cabling			1.0		13,920			13,920		EJ	SC	MA	BN	LI	17,678	X3	30
1.9.5.1	Notebooks, Computers			8.0		2,200			17,600		CP	SC	MA	BN	LI	22,352	X3	30
1.9.5.1	Hardware			1.0		22,000			22,000		EJ	SC	MA	BN	LI	27,940	X1	20
1.9.5.1	Training			1.0	Lot	24,000			24,000		EJ	SC	MA	BN	LI	30,480	X0	30
1.9.5.1	Hardware Switches			3.0		10,000			30,000		EJ	SC	MA	BN	LI	38,100	X2	15
1.9.5.1	PLC Hardware			2.0		18,000			36,000		PC	SC	MA	BN	LI	45,720	X2	15
1.9.5.1	Servers			2.0		35,000			70,000		AC	SC	MA	BN	LI	88,900	X2	30
1.9.5.1	Test Equipment			1.0	Lot	84,000			84,000		EJ	SC	MA	BN	LI	106,680	X3	20
1.9.5.1	VME Systems			8.0		22,338			178,704		EJ	SC	MA	BN	LI	226,954	X2	15

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.5.1	Engineer						4328	59.66	258,205	E1	HC	IH	SW	BN	LI	327,920	X0	35
1.9.5.1	Engineer						5280	59.66	315,000	E1	HC	IH	SW	BN	LI	400,050	X0	30
1.9.5.1	Supervision						5280	80.68	426,000	S1	HC	IH	SW	BN	LI	541,020	X0	40
1.9.5.1	Engineer						320	59.66	19,091	E1	HC	IH	T2	BN	LI	24,245	X0	20
1.9.5.1	Technician 2						360	49.43	17,795	T5	HC	IH	T3	BN	LI	22,600	X0	20
1.9.5.2	***HEBT Controls***								1,778,267							2,257,066		
1.9.5.2	HEBT - Install-Programming						133.76	59.66	7,980	E1	HC	IH	IN	BN	LI	10,135	X0	30
1.9.5.2	HEBT - Install - Eng						156.724	59.66	9,350	E1	HC	IH	IN	BN	LI	11,875	X0	40
1.9.5.2	HEBT - Install-Tech 2						683.87	49.43	33,805	T5	HC	IH	IN	BN	LI	42,932	X0	40
1.9.5.2	HEBT - Craft Support						1239.79	45.45	56,354	T6	HC	IH	LA	BN	LI	71,570	X0	25
1.9.5.2	HEBT - VME Computers			1.0	Lot	366,676			366,676		EJ	SC	MA	BN	LI	465,679	X1	25
1.9.5.2	HEBT - Programming support						321.058	59.66	19,154	E1	HC	IH	SW	BN	LI	24,326	X0	25
1.9.5.2	HEBT - IOC Software Engineer						14873	59.66	887,310	E1	HC	IH	SW	BN	LI	1,126,883	X0	35
1.9.5.2	HEBT - EDIA Engineering						2811.91	59.66	167,756	E1	HC	IH	T2	BN	LI	213,050	X0	25
1.9.5.2	HEBT - Tech 2 Support						4236	49.43	209,393	T5	HC	IH	T3	BN	LI	265,929	X0	25
1.9.5.2	HEBT - Install - SNS Tech						683.87	29.96	20,489	T5	HC	IH	IN	BN	LI	24,689	X0	40
1.9.5.3	Ring	1	2,431,906	0.0		0	0	0.00	0							0		0
1.9.5.3	Install-Tech 2						1005.7	49.43	49,714	T5	HC	IH	IN	BN	LI	63,136	X0	40
1.9.5.3	***Ring Controls***								2,424,059							3,076,595		
1.9.5.3	Install - Eng						230.476	59.66	13,750	E1	HC	IH	IN	BN	LI	17,463	X0	40
1.9.5.3	Programming Support						472.133	59.66	28,167	E1	HC	IH	IN	BN	LI	35,772	X0	30
1.9.5.3	Install-SNS Tech						1005.7	29.96	30,131	T5	HC	IH	IN	BN	LI	36,308	X0	40
1.9.5.3	Craft Support						1823.23	45.45	82,874	T6	HC	IH	LA	BN	LI	105,250	X0	25
1.9.5.3	VME Computers			1.0	Lot	539,229			539,229		EJ	SC	MA	BN	LI	684,821	X1	25
1.9.5.3	Programming support						321.058	59.66	19,154	E1	HC	IH	SW	BN	LI	24,326	X0	25
1.9.5.3	IOC Software Engineer						18349	59.66	1,094,685	E1	HC	IH	SW	BN	LI	1,390,250	X0	35
1.9.5.3	EDIA Engineering						4134.99	59.66	246,690	E1	HC	IH	T2	BN	LI	313,296	X0	25
1.9.5.3	Tech 2 Support						6229.39	49.43	307,930	T5	HC	IH	T3	BN	LI	391,071	X0	25
1.9.5.3	Install-Programming						196.7	59.66	11,735	E1	HC	IH	IN	BN	LI	14,903	X0	30
1.9.5.4	RTBT	1	1,627,639	0.0		0	0	0.00	0							0		0
1.9.5.4	Install-SNS Tech						683.7	29.96	20,489	T5	HC	IH	IN	BN	LI	24,689	X0	40
1.9.5.4	***RTBT Controls***								1,614,323							2,048,858		
1.9.5.4	Install-Programming						133.76	59.66	7,980	E1	HC	IH	IN	BN	LI	10,135	X0	30
1.9.5.4	Install - Eng						156.724	59.66	9,350	E1	HC	IH	IN	BN	LI	11,875	X0	40
1.9.5.4	Install-Tech 2						683.7	49.43	33,805	T5	HC	IH	IN	BN	LI	42,932	X0	40
1.9.5.4	Craft Support						1239.79	45.45	56,354	T6	HC	IH	LA	BN	LI	71,570	X0	25
1.9.5.4	VME Computers			1.0	Lot	366,676			366,676		EJ	SC	MA	BN	LI	465,679	X1	25
1.9.5.4	Programming support						321.058	59.66	19,154	E1	HC	IH	SW	BN	LI	24,326	X0	25
1.9.5.4	IOC Software Engineer						12125	59.66	723,366	E1	HC	IH	SW	BN	LI	918,675	X0	35
1.9.5.4	EDIA Engineering						2811.91	59.66	167,756	E1	HC	IH	T2	BN	LI	213,050	X0	25
1.9.5.4	Tech 2 Support						4236	49.43	209,393	T5	HC	IH	T3	BN	LI	265,929	X0	25
1.9.5.5	Apps Program	1	1,252,500	0.0		0	0	0.00	0							0		0
1.9.5.5	***Application Software***								1,252,500							1,590,675		
1.9.5.5	Software Packages & Maint			1.0	Lot	150,000			150,000		EJ	SC	SW	BN	LI	190,500	X1	30
1.9.5.5	IOC Software Engineer						18480	59.66	1,102,500	E1	EJ	IH	SW	BN	LI	1,400,175	X0	35

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.6	***Target Global Controls***								1,664,589							1,955,694		
1.9.6.1	***Target Controls Integrastion***								629,133							740,944		
1.9.6.1.1	**Title II Engr: Specify, training, & maint.**						1000	62.90	62,900	ORNL_TSM	EJ	IH	T2	OR	LI	75,763	X0	30
1.9.6.1.1	**Title II Engr: design cabinet**						20	62.90	1,258	ORNL_TSM	EJ	IH	T2	OR	LI	1,515	X0	30
1.9.6.1.1	**Title I for FY99**						480	62.90	30,192	ORNL_TSM	EJ	IH	T2	OR	LI	36,366	X0	30
1.9.6.1.2	**IOC Development H/W & S/W**			1.0	lot	135,700			135,700		CP	SC	MA	OR	LI	149,134	X1	30
1.9.6.1.2	**Cabinet hardware**			1.0					1,500		CP	SC	MA	OR	LI	1,649	X1	30
1.9.6.1.2	**Cabinet fabrication & test (inc. PLC sys.)**						40	29.96	1,198	ORNL_TEC	EJ	IH	LA	OR	LI	1,444	X0	30
1.9.6.1.3	**Title III Engr: Proc. support, as-built dwgs, etc.**						306	62.90	19,247	ORNL_TSM	EJ	IH	T3	OR	LI	23,183	X0	30
1.9.6.1.4	**Checkout system**						80	62.90	5,032	ORNL_TSM	EJ	IH	T3	OR	LI	6,061	X0	30
1.9.6.1.4	**Checkout system**						80	29.96	2,397	ORNL_TEC	EJ	IH	IN	OR	LI	2,888	X0	30
1.9.6.1.5	**Travel to vendors, conferences, etc.**			15.0	trips	1,500			22,500		EJ	IH	IN	OR	LI	24,728	X0	30
1.9.6.1.5	**WBS integration**						880	62.90	55,352	ORNL_TSM	EJ	IH	T2	OR	LI	66,671	X0	30
1.9.6.1.6	**EPICS & Target Control Op System control**						2640	62.90	166,056	ORNL_TSM	EJ	IH	T2	OR	LI	200,014	X0	30
1.9.6.1.7	**EPICS interface, DeviceNet, RTP, etc.**						2000	62.90	125,800	ORNL_TSM	EJ	IH	T2	OR	LI	151,526	X0	30
1.9.6.2	***Target Systems***								226,146							259,311		
1.9.6.2.1	**Title II Engr: spec IOC H/W**						36	62.90	2,264	ORNL_TSM	EJ	IH	T2	OR	LI	2,727	X0	30
1.9.6.2.1	**Title II Engr: design cabinet**						24	62.90	1,510	ORNL_TSM	EJ	IH	T2	OR	LI	1,818	X0	30
1.9.6.2.1	**Title II Engr: spec PLC H/W**						60	62.90	3,774	ORNL_TSM	EJ	IH	T2	OR	LI	4,546	X0	30
1.9.6.2.1	**Title II Engr: design cabinet**						40	62.90	2,516	ORNL_TSM	EJ	IH	T2	OR	LI	3,031	X0	30
1.9.6.2.2	**IOC system hardware**			0.3	lot	20,000			6,000		CP	SC	MA	OR	LI	6,594	X1	30
1.9.6.2.2	**Cabinet hardware**			0.3	lot	3,900			1,170		CP	SC	MA	OR	LI	1,286	X1	30
1.9.6.2.2	**Cabinet fabrication & test (inc. PLC sys.)**						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.2.2	**PLC system hardware**			0.5	lot	225,666			112,833		CP	SC	MA	OR	LI	124,003	X1	30
1.9.6.2.2	**Cabinet hardware**			0.5	lot	6,800			3,400		CP	SC	MA	OR	LI	3,737	X1	30
1.9.6.2.2	**Cabinet fabrication & test (inc. PLC sys.)**						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.2.3	**Title III Engr: Proc. support, as-built dwgs, etc.**						18	62.90	1,132	ORNL_TSM	EJ	IH	T3	OR	LI	1,364	X0	30
1.9.6.2.3	**Title III Engr: Proc. support, as-built dwgs, etc.**						30	62.90	1,887	ORNL_TSM	EJ	IH	T3	OR	LI	2,273	X0	30
1.9.6.2.4	**Software design**						525	62.90	33,023	ORNL_TSM	EJ	IH	SW	OR	LI	39,776	X0	30
1.9.6.2.4	**Software design**						525	62.90	33,023	ORNL_TSM	EJ	IH	SW	OR	LI	39,776	X0	30
1.9.6.2.6	**Cabinet installation**						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.2.6	**Cabinet installation**						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.2.7	**Checkout / startup engineering support**						75	62.90	4,718	ORNL_TSM	EJ	IH	T3	OR	LI	5,682	X0	30
1.9.6.2.7	**Checkout / startup technician support**						150	29.96	4,494	ORNL_TEC	EJ	IH	IN	OR	LI	5,415	X0	30
1.9.6.2.7	**Checkout / startup engineering support**						75	62.90	4,718	ORNL_TSM	EJ	IH	T3	OR	LI	5,682	X0	30
1.9.6.2.7	**Checkout / startup technician support**						150	29.96	4,494	ORNL_TEC	EJ	IH	IN	OR	LI	5,415	X0	30
1.9.6.3	***Moderator Systems***								47,854							56,978		
1.9.6.3.1	**Title II Engr: spec PLC H/W**						30	62.90	1,887	ORNL_TSM	EJ	IH	T2	OR	LI	2,273	X0	30
1.9.6.3.1	**Title II Engr: design cabinet**						20	62.90	1,258	ORNL_TSM	EJ	IH	T2	OR	LI	1,515	X0	30
1.9.6.3.2	**IOC system hardware**			0.3	lot	20,000			5,000		CP	SC	MA	OR	LI	5,495	X1	30
1.9.6.3.2	**Cabinet hardware**			0.3	lot	3,900			975		CP	SC	MA	OR	LI	1,072	X1	30
1.9.6.3.2	**Cabinet fabrication & test (inc. IOC sys.)**						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.3.3	**Title III Engr: Proc. support, as-built dwgs, etc.**						15	62.90	944	ORNL_TSM	EJ	IH	T3	OR	LI	1,136	X0	30
1.9.6.3.4	**Software design**						437.5	62.90	27,519	ORNL_TSM	EJ	IH	SW	OR	LI	33,146	X0	30
1.9.6.3.6	**Cabinet installation**						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.6.3.7	Checkout / startup engineering support						62.5	62.90	3,931	ORNL_TSM	EJ	IH	T3	OR	LI	4,735	X0	30
1.9.6.3.7	Checkout / startup technician support						125	29.96	3,745	ORNL_TEC	EJ	IH	IN	OR	LI	4,513	X0	30
1.9.6.4	***Reflector Systems***								38,323							44,854		
1.9.6.4.1	Title II Engr: spec IOC H/W						12	62.90	755	ORNL_TSM	EJ	IH	T2	OR	LI	909	X0	30
1.9.6.4.1	Title II Engr: design rack ass'y						15	62.90	944	ORNL_TSM	EJ	IH	T2	OR	LI	1,136	X0	30
1.9.6.4.1	Title II Engr. Design sig. Cond.						12	62.90	3,275	ORNL_TSM	EJ	IH	T2	OR	LI	3,679	X0	30
1.9.6.4.2	IOC system hardware			0.1	lot	39,600			5,940		CP	SC	MA	OR	LI	6,528	X1	30
1.9.6.4.2	Cabinet hardware			0.1	lot	3,900			585		CP	SC	MA	OR	LI	643	X1	30
1.9.6.4.2	Cabinet fabrication & test						12	24.88	299	IND_CFT	EJ	IH	IN	CM	LI	307	X0	30
1.9.6.4.2	Signal Cond. Hardware			0.1		16,800			2,520		CP	SC	MA	OR	LI	2,769	X2	30
1.9.6.4.3	Title III Engr: Proc. support, as-built dwgs, etc.						11.7	62.90	736	ORNL_TSM	EJ	IH	T3	OR	LI	886	X0	30
1.9.6.4.4	Software design						300	62.90	18,870	ORNL_TSM	EJ	IH	SW	OR	LI	22,729	X0	30
1.9.6.4.5	Sig. Cond. Fab and test						12	29.96	360	ORNL_TEC	EJ	IH	LA	OR	LI	433	X0	30
1.9.6.4.5	IOC fab and test						12	29.96	360	ORNL_TEC	EJ	IH	LA	OR	LI	433	X0	30
1.9.6.4.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.4.7	Checkout / startup engineering support						37.5	62.90	2,359	ORNL_TSM	EJ	IH	T3	OR	LI	2,841	X0	30
1.9.6.4.7	Checkout / startup technician support						37.5	29.96	1,124	ORNL_TEC	EJ	IH	IN	OR	LI	1,354	X0	30
1.9.6.5	***Vessel Systems***								51,358							60,131		
1.9.6.5.1	Title II Engr: spec IOC H/W						24	62.90	1,510	ORNL_TSM	EJ	IH	T2	OR	LI	1,818	X0	30
1.9.6.5.1	Title II Engr: design rack ass'y						16	62.90	1,006	ORNL_TSM	EJ	IH	T2	OR	LI	1,212	X0	30
1.9.6.5.1	Title II Engr. Design sig. Cond.						16	62.90	4,366	ORNL_TSM	EJ	IH	T2	OR	LI	4,905	X0	30
1.9.6.5.2	IOC system hardware			0.2	lot	39,600			7,920		CP	SC	MA	OR	LI	8,704	X1	30
1.9.6.5.2	Cabinet hardware			0.2	lot	3,900			780		CP	SC	MA	OR	LI	857	X1	30
1.9.6.5.2	Cabinet fabrication & test						16	24.88	398	IND_CFT	EJ	IH	IN	CM	LI	410	X0	30
1.9.6.5.2	Signal Cond. Hardware			0.2		16,800			3,360		CP	SC	MA	OR	LI	3,693	X2	30
1.9.6.5.3	Title III Engr: Proc. support, as-built dwgs, etc.						16.8	62.90	1,057	ORNL_TSM	EJ	IH	T3	OR	LI	1,273	X0	30
1.9.6.5.4	Software design						400	62.90	25,160	ORNL_TSM	EJ	IH	SW	OR	LI	30,305	X0	30
1.9.6.5.5	Sig. Cond. Fab and test						16	29.96	479	ORNL_TEC	EJ	IH	LA	OR	LI	578	X0	30
1.9.6.5.5	IOC fab and test						16	29.96	479	ORNL_TEC	EJ	IH	LA	OR	LI	578	X0	30
1.9.6.5.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.5.7	Checkout / startup engineering support						50	62.90	3,145	ORNL_TSM	EJ	IH	T3	OR	LI	3,788	X0	30
1.9.6.5.7	Checkout / startup technician support						50	29.96	1,498	ORNL_TEC	EJ	IH	IN	OR	LI	1,805	X0	30
1.9.6.6	***Shielding Systems***								179,255							209,945		
1.9.6.6.1	Title II Engr: spec IOC H/W						84	62.90	5,284	ORNL_TSM	EJ	IH	T2	OR	LI	6,364	X0	30
1.9.6.6.1	Title II Engr: design rack ass'y						56	62.90	3,522	ORNL_TSM	EJ	IH	T2	OR	LI	4,243	X0	30
1.9.6.6.1	Title II Engr. Design sig. Cond.						56	62.90	15,282	ORNL_TSM	EJ	IH	T2	OR	LI	17,167	X0	30
1.9.6.6.2	IOC system hardware			0.7	lot	39,600			27,720		CP	SC	MA	OR	LI	30,464	X1	30
1.9.6.6.2	Cabinet hardware			0.7	lot	3,900			2,730		CP	SC	MA	OR	LI	3,000	X1	30
1.9.6.6.2	Cabinet fabrication & test						56	24.88	1,393	IND_CFT	EJ	IH	IN	CM	LI	1,434	X0	30
1.9.6.6.2	Signal Cond. Hardware			0.7		16,800			11,760		CP	SC	MA	OR	LI	12,924	X2	30
1.9.6.6.3	Title III Engr: Proc. support, as-built dwgs, etc.						58.8	62.90	3,699	ORNL_TSM	EJ	IH	T3	OR	LI	4,455	X0	30
1.9.6.6.4	Software design						1400	62.90	88,060	ORNL_TSM	EJ	IH	SW	OR	LI	106,068	X0	30
1.9.6.6.5	Sig. Cond. Fab and test						56	29.96	1,678	ORNL_TEC	EJ	IH	LA	OR	LI	2,022	X0	30
1.9.6.6.5	IOC fab and test						56	29.96	1,678	ORNL_TEC	EJ	IH	LA	OR	LI	2,022	X0	30
1.9.6.6.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.6.6.7	Checkout / startup engineering support						175	62.90	11,008	ORNL_TSM	EJ	IH	T3	OR	LI	13,259	X0	30
1.9.6.6.7	Checkout / startup technician support						175	29.96	5,243	ORNL_TEC	EJ	IH	IN	OR	LI	6,318	X0	30
1.9.6.7	***Target Utilty Systems***								410,922							486,560		
1.9.6.7.1	Title II Engr: spec PLC H/W						129.6	62.90	8,152	ORNL_TSM	EJ	IH	T2	OR	LI	9,819	X0	30
1.9.6.7.1	Title II Engr: design cabinet						86.4	62.90	5,435	ORNL_TSM	EJ	IH	T2	OR	LI	6,546	X0	30
1.9.6.7.1	Title II Engr: spec PLC H/W						144	62.90	9,058	ORNL_TSM	EJ	IH	T2	OR	LI	10,910	X0	30
1.9.6.7.1	Title II Engr: design cabinet						80	62.90	5,032	ORNL_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.6.7.2	IOC system hardware			1.1	lot	20,000			21,600		CP	SC	MA	OR	LI	23,738	X1	30
1.9.6.7.2	Cabinet hardware			1.1	lot	3,900			4,212		CP	SC	MA	OR	LI	4,629	X1	30
1.9.6.7.2	Cabinet fabrication & test (inc. PLC sys.)						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.7.2	PLC system hardware			1.8	lot	22,600			40,680		CP	SC	MA	OR	LI	44,707	X1	30
1.9.6.7.2	Cabinet hardware			1.8	lot	6,800			12,240		CP	SC	MA	OR	LI	13,452	X1	30
1.9.6.7.2	Cabinet fabrication & test (inc. PLC sys.)						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.7.3	Title III Engr: Proc. support, as-built dwgs, etc.						64.8	62.90	4,076	ORNL_TSM	EJ	IH	T3	OR	LI	4,909	X0	30
1.9.6.7.3	Title III Engr: Proc. support, as-built dwgs, etc.						67.2	62.90	4,227	ORNL_TSM	EJ	IH	T3	OR	LI	5,091	X0	30
1.9.6.7.4	Software design						1890	62.90	118,881	ORNL_TSM	EJ	IH	SW	OR	LI	143,192	X0	30
1.9.6.7.4	Software design						1890	62.90	118,881	ORNL_TSM	EJ	IH	SW	OR	LI	143,192	X0	30
1.9.6.7.6	Cabinet installation						16	24.88	398	IND_CFT	EJ	IH	IN	CM	LI	410	X0	30
1.9.6.7.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.7.7	Checkout / startup engineering support						162	62.90	10,190	ORNL_TSM	EJ	IH	T3	OR	LI	12,274	X0	30
1.9.6.7.7	Checkout / startup technician support						324	29.96	9,707	ORNL_TEC	EJ	IH	IN	OR	LI	11,697	X0	30
1.9.6.7.7	Checkout / startup engineering support						270	62.90	16,983	ORNL_TSM	EJ	IH	T3	OR	LI	20,456	X0	30
1.9.6.7.7	Checkout / startup technician support						540	29.96	16,178	ORNL_TEC	EJ	IH	IN	OR	LI	19,495	X0	30
1.9.6.8	***Remote Handling System Interface***								22,846							27,182		
1.9.6.8.1	Title II Engr: spec PLC H/W						14.4	62.90	906	ORNL_TSM	EJ	IH	T2	OR	LI	1,091	X0	30
1.9.6.8.1	Title II Engr: design cabinet						9.6	62.90	604	ORNL_TSM	EJ	IH	T2	OR	LI	727	X0	30
1.9.6.8.2	IOC system hardware			0.1	lot	20,000			2,400		CP	SC	MA	OR	LI	2,638	X1	30
1.9.6.8.2	Cabinet hardware			0.1	lot	3,900			468		CP	SC	MA	OR	LI	514	X1	30
1.9.6.8.2	Cabinet fabrication & test (inc. PLC sys.)						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.8.3	Title III Engr: Proc. support, as-built dwgs, etc.						7.2	62.90	453	ORNL_TSM	EJ	IH	T3	OR	LI	545	X0	30
1.9.6.8.4	Software design						210	62.90	13,209	ORNL_TSM	EJ	IH	SW	OR	LI	15,910	X0	30
1.9.6.8.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.8.7	Checkout / startup engineering support						18	62.90	1,132	ORNL_TSM	EJ	IH	T3	OR	LI	1,364	X0	30
1.9.6.8.7	Checkout / startup technician support						36	29.96	1,079	ORNL_TEC	EJ	IH	IN	OR	LI	1,300	X0	30
1.9.6.9	***Beam Dump Systems***								58,752							69,790		
1.9.6.9.1	Title II Engr: spec PLC H/W						16.8	62.90	1,057	ORNL_TSM	EJ	IH	T2	OR	LI	1,273	X0	30
1.9.6.9.1	Title II Engr: design cabinet						11.2	62.90	704	ORNL_TSM	EJ	IH	T2	OR	LI	849	X0	30
1.9.6.9.1	Title II Engr: spec PLC H/W						14.4	62.90	906	ORNL_TSM	EJ	IH	T2	OR	LI	1,091	X0	30
1.9.6.9.1	Title II Engr: design cabinet						80	62.90	5,032	ORNL_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.6.9.2	IOC system hardware			0.1	lot	20,000			2,800		CP	SC	MA	OR	LI	3,077	X1	30
1.9.6.9.2	Cabinet hardware			0.1	lot	3,900			546		CP	SC	MA	OR	LI	600	X1	30
1.9.6.9.2	Cabinet fabrication & test (inc. PLC sys.)						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.6.9.2	PLC system hardware			0.2	lot	22,600			4,068		CP	SC	MA	OR	LI	4,471	X1	30
1.9.6.9.2	Cabinet hardware			0.2	lot	6,800			1,224		CP	SC	MA	OR	LI	1,345	X1	30
1.9.6.9.2	Cabinet fabrication & test (inc. PLC sys.)						80	29.96	2,397	ORNL_TEC	EJ	IH	LA	OR	LI	2,888	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.6.9.3	Title III Engr: Proc. support, as-built dwgs, etc.						8.4	62.90	528	ORNL_TSM	EJ	IH	T3	OR	LI	636	X0	30
1.9.6.9.3	Title III Engr: Proc. support, as-built dwgs, etc.						28.32	62.90	1,781	ORNL_TSM	EJ	IH	T3	OR	LI	2,146	X0	30
1.9.6.9.4	Software design						245	62.90	15,411	ORNL_TSM	EJ	IH	SW	OR	LI	18,562	X0	30
1.9.6.9.4	Software design						189	62.90	11,888	ORNL_TSM	EJ	IH	SW	OR	LI	14,319	X0	30
1.9.6.9.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.9.6	Cabinet installation						8	24.88	199	IND_CFT	EJ	IH	IN	CM	LI	205	X0	30
1.9.6.9.7	Checkout / startup engineering support						35	62.90	2,202	ORNL_TSM	EJ	IH	T3	OR	LI	2,652	X0	30
1.9.6.9.7	Checkout / startup technician support						70	29.96	2,097	ORNL_TEC	EJ	IH	IN	OR	LI	2,527	X0	30
1.9.6.9.7	Checkout / startup engineering support						27	62.90	1,698	ORNL_TSM	EJ	IH	T3	OR	LI	2,046	X0	30
1.9.6.9.7	Checkout / startup technician support						54	29.96	1,618	ORNL_TEC	EJ	IH	IN	OR	LI	1,949	X0	30
1.9.7	***Control Systems***								287,700							346,212		
1.9.7.1	***Instrument Support Facilities Controls***								0							0		
1.9.7.2	***System Integration***								140,800							180,421		
1.9.7.2	Scientist						1709.57	82.36	140,800	P1	EJ	IH	LA	AN	LI	180,421	X0	0
1.9.7.3	***POW3 Controls***								16,950							19,130		
1.9.7.3	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.3	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.4	***INEL2 Controls***								16,950							19,130		
1.9.7.4	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.4	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.5	***SCD1 Controls***								11,300							12,753		
1.9.7.5	VME Mainframe			2.0	ea	2,850			5,700		CP	SC	MA	AN	LI	6,433	X2	20
1.9.7.5	MVME167 Processor			2.0	ea	2,800			5,600		CP	SC	MA	AN	LI	6,320	X2	20
1.9.7.6	***POW7 Controls***								11,300							12,753		
1.9.7.6	VME Mainframe			2.0	ea	2,850			5,700		CP	SC	MA	AN	LI	6,433	X2	20
1.9.7.6	MVME167 Processor			2.0	ea	2,800			5,600		CP	SC	MA	AN	LI	6,320	X2	20
1.9.7.7	***INEL4 Controls***								11,300							12,753		
1.9.7.7	VME Mainframe			2.0	ea	2,850			5,700		CP	SC	MA	AN	LI	6,433	X2	20
1.9.7.7	MVME167 Processor			2.0	ea	2,800			5,600		CP	SC	MA	AN	LI	6,320	X2	20
1.9.7.8	***INEL1 Controls***								16,950							19,130		
1.9.7.8	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.8	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.9	***SANS2 Cotrols***								16,950							19,130		
1.9.7.9	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.9	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.10	***REF1 Controls***								16,950							19,130		
1.9.7.10	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.10	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.11	***POW6 Controls***								16,950							19,130		
1.9.7.11	VME Mainframe			3.0	ea	2,850			8,550		CP	SC	MA	AN	LI	9,650	X2	20
1.9.7.11	MVME167 Processor			3.0	ea	2,800			8,400		CP	SC	MA	AN	LI	9,480	X2	20
1.9.7.12	***INEL5 Controls***								11,300							12,753		
1.9.7.12	VME Mainframe			2.0	ea	2,850			5,700		CP	SC	MA	AN	LI	6,433	X2	20
1.9.7.12	MVME167 Processor			2.0	ea	2,800			5,600		CP	SC	MA	AN	LI	6,320	X2	20
1.9.8	***Conventional Facilities Global Controls***								779,920							924,246		

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.8.1	***Integration***								198,885							230,489		
1.9.8.1.1	**Title II Engr: spec IOC H/W**						80	62.90	5,032	SNS_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.8.1.1	**Title II Engr: design cabinet**						100	62.90	6,290	SNS_TSM	EJ	IH	T2	OR	LI	7,576	X0	30
1.9.8.1.2	**Memory expansion for Sun Ultra 5**			1.0	ea.	825			825		VQ	IH	EQ	OR	LI	907	X1	30
1.9.8.1.2	**Sun Ultra 5 Workstation**			1.0	ea.	3,720			3,720		VQ	IH	EQ	OR	LI	4,088	X1	30
1.9.8.1.2	**Printer, B&W, with network connection**			1.0	ea.	2,000			2,000		VQ	IH	EQ	OR	LI	2,198	X2	30
1.9.8.1.2	**ICWG travel**			16.0	ea.	1,500			24,000		HC	SC	MA	OR	LI	24,360	X0	30
1.9.8.1.2	**Travel for EPICS training**			2.0	ea.	1,500			3,000		HC	SC	MA	OR	LI	3,045	X0	30
1.9.8.1.2	**IOC cabinet, assembled (from panel shop)**			1.0	ea.	2,446			2,446		EJ	IH	EQ	OR	LI	2,688	X2	30
1.9.8.1.2	**Monitor, 21", with cable**			1.0	ea.	1,380			1,380		VQ	IH	EQ	OR	LI	1,517	X1	30
1.9.8.1.2	**IOC system hardware**			2.0	sys	13,310			26,620		CP	IH	EQ	OR	LI	29,255	X2	30
1.9.8.1.3	**Title III Engr: Procure support, as-built dwgs, etc.**						54	62.90	3,397	SNS_TSM	HC	IH	T3	OR	LI	4,091	X0	30
1.9.8.1.4	**Software design**						8	62.90	503	SNS_TSM	HC	IH	SW	OR	LI	606	X0	30
1.9.8.1.5	**IOC fab and test**						40	29.96	1,198	SNS_TEC	EJ	IH	LA	OR	LI	1,444	X0	30
1.9.8.1.6	**Cabinet installation**						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30
1.9.8.1.7	**Checkout / startup engineering support**						16	62.90	1,006	SNS_TSM	EJ	IH	T3	OR	LI	1,212	X0	30
1.9.8.1.7	**Checkout / startup technician support**						16	29.96	479	SNS_TEC	EJ	IH	IN	OR	LI	578	X0	30
1.9.8.1.8	**Development system maintenance**						880	62.90	55,352	SNS_TSM	EJ	IH	T2	OR	LI	66,669	X0	30
1.9.8.1.8	**ICWG participation**						576	62.90	36,230	SNS_TSM	HC	IH	T2	OR	LI	43,638	X0	30
1.9.8.1.8	**Project management support**						160	62.90	10,064	SNS_TSM	EJ	IH	T2	OR	LI	12,122	X0	30
1.9.8.1.8	**Design review support**						160	62.90	10,064	SNS_TSM	EJ	IH	T2	OR	LI	12,122	X0	30
1.9.8.1.8	**EPICS training**						80	62.90	5,032	SNS_TSM	HC	IH	T2	OR	LI	6,061	X0	30
1.9.8.2	***Electric Power and Comm Sys I/F***								72,071							86,141		
1.9.8.2.1	**Title II Engr: design cabinet**						33	62.90	2,076	SNS_TSM	EJ	IH	T2	OR	LI	2,500	X0	30
1.9.8.2.1	**Title II Engr: spec IOC H/W**						26.4	62.90	1,661	SNS_TSM	EJ	IH	T2	OR	LI	2,000	X0	30
1.9.8.2.2	**IOC cabinet, assembled (from panel shop)**			0.3	ea.	2,446			807		EJ	IH	EQ	OR	LI	887	X1	30
1.9.8.2.2	**IOC system hardware**			0.3	sys	13,310			4,392		CP	IH	EQ	OR	LI	4,827	X1	30
1.9.8.2.3	**Title III Engr: Procure support, as-built dwgs, etc.**						17.82	62.90	1,121	SNS_TSM	HC	IH	T3	OR	LI	1,350	X0	30
1.9.8.2.4	**Software design**						583	62.90	36,671	SNS_TSM	HC	IH	SW	OR	LI	44,168	X0	30
1.9.8.2.4	**Develop S/W driver for SCADA sys I/F**						240	71.01	17,042	LBNL_TSM	HC	IH	SW	OR	LI	20,451	X0	30
1.9.8.2.5	**IOC fab and test**						13.2	29.96	395	SNS_TEC	EJ	IH	LA	OR	LI	477	X0	30
1.9.8.2.6	**Cabinet installation**						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30
1.9.8.2.7	**Checkout / startup technician support**						82.5	29.96	2,472	SNS_TEC	EJ	IH	IN	OR	LI	2,978	X0	30
1.9.8.2.7	**Checkout / startup engineering support**						82.5	62.90	5,189	SNS_TSM	EJ	IH	T3	OR	LI	6,250	X0	30
1.9.8.3	***HVAC Systems***								199,293							238,187		
1.9.8.3.1	**Title II Engr: design cabinet**						100	62.90	6,290	SNS_TSM	EJ	IH	T2	OR	LI	7,576	X0	30
1.9.8.3.1	**Title II Engr: spec IOC H/W**						80	62.90	5,032	SNS_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.8.3.2	**IOC cabinet, assembled (from panel shop)**			1.0	ea.	2,446			2,446		EJ	IH	EQ	OR	LI	2,688	X2	30
1.9.8.3.2	**IOC system hardware**			1.0	sys	13,310			13,310		CP	IH	EQ	OR	LI	14,628	X2	30
1.9.8.3.3	**Title III Engr: Procure support, as-built dwgs, etc.**						54	62.90	3,397	SNS_TSM	HC	IH	T3	OR	LI	4,091	X0	30
1.9.8.3.4	**Develop S/W driver for tunnel AC I/F**						240	71.01	17,042	LBNL_TSM	HC	IH	SW	OR	LI	20,451	X0	30
1.9.8.3.4	**Software design**						1750	62.90	110,075	SNS_TSM	HC	IH	SW	OR	LI	132,580	X0	30
1.9.8.3.4	**Develop S/W driver for HVAC DCS I/F**						240	71.01	17,042	LBNL_TSM	HC	IH	SW	OR	LI	20,451	X0	30
1.9.8.3.5	**IOC fab and test**						40	29.96	1,198	SNS_TEC	EJ	IH	LA	OR	LI	1,444	X0	30
1.9.8.3.6	**Cabinet installation**						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30

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1.9.8.3.7	Checkout / startup engineering support						250	62.90	15,725	SNS_TSM	EJ	IH	T3	OR	LI	18,940	X0	30
1.9.8.3.7	Checkout / startup technician support						250	29.96	7,490	SNS_TEC	EJ	IH	IN	OR	LI	9,025	X0	30
1.9.8.4	***Mechanical & Piping Systems***								182,251							217,736		
1.9.8.4.1	Title II Engr: spec IOC H/W						80	62.90	5,032	SNS_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.8.4.1	Title II Engr: design cabinet						100	62.90	6,290	SNS_TSM	EJ	IH	T2	OR	LI	7,576	X0	30
1.9.8.4.2	IOC cabinet, assembled (from panel shop)			1.0	ea.	2,446			2,446		EJ	IH	EQ	OR	LI	2,688	X2	30
1.9.8.4.2	IOC system hardware			1.0	sys	13,310			13,310		CP	IH	EQ	OR	LI	14,628	X2	30
1.9.8.4.3	Title III Engr: Procure support, as-built dwgs, etc.						54	62.90	3,397	SNS_TSM	HC	IH	T3	OR	LI	4,091	X0	30
1.9.8.4.4	Develop S/W driver for C.F. DCS						240	71.01	17,042	LBNL_TSM	HC	IH	SW	OR	LI	20,451	X0	30
1.9.8.4.4	Software design						1750	62.90	110,075	SNS_TSM	HC	IH	SW	OR	LI	132,580	X0	30
1.9.8.4.5	IOC fab and test						40	29.96	1,198	SNS_TEC	EJ	IH	LA	OR	LI	1,444	X0	30
1.9.8.4.6	Cabinet installation						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30
1.9.8.4.7	Checkout / startup engineering support						250	62.90	15,725	SNS_TSM	EJ	IH	T3	OR	LI	18,940	X0	30
1.9.8.4.7	Checkout / startup technician support						250	29.96	7,490	SNS_TEC	EJ	IH	IN	OR	LI	9,025	X0	30
1.9.8.5	***Waste Systems***								110,424							131,848		
1.9.8.5.1	Title II Engr: spec IOC H/W						53.6	62.90	3,371	SNS_TSM	EJ	IH	T2	OR	LI	4,061	X0	30
1.9.8.5.1	Title II Engr: design cabinet						67	62.90	4,214	SNS_TSM	EJ	IH	T2	OR	LI	5,076	X0	30
1.9.8.5.2	IOC cabinet, assembled (from panel shop)			0.7	ea.	2,446			1,639		EJ	IH	EQ	OR	LI	1,801	X1	30
1.9.8.5.2	IOC system hardware			0.7	sys	13,310			8,918		CP	IH	EQ	OR	LI	9,801	X1	30
1.9.8.5.3	Title III Engr: Procure support, as-built dwgs, etc.						36.18	62.90	2,276	SNS_TSM	HC	IH	T3	OR	LI	2,741	X0	30
1.9.8.5.4	Software design						1167	62.90	73,404	SNS_TSM	HC	IH	SW	OR	LI	88,412	X0	30
1.9.8.5.5	IOC fab and test						26.8	29.96	803	SNS_TEC	EJ	IH	LA	OR	LI	968	X0	30
1.9.8.5.6	Cabinet installation						8	30.61	245	IND_EE	HC	IH	IN	CM	LI	252	X0	30
1.9.8.5.7	Checkout / startup technician support						167.5	29.96	5,018	SNS_TEC	EJ	IH	IN	OR	LI	6,047	X0	30
1.9.8.5.7	Checkout / startup engineering support						167.5	62.90	10,536	SNS_TSM	EJ	IH	T3	OR	LI	12,690	X0	30
1.9.8.7	***Emergency Response Facility I/F***								16,995							19,845		
1.9.8.6.1	Title I & II Engineering						40	62.90	2,516	SNS_TSM	EJ	IH	T2	OR	LI	3,030	X0	30
1.9.8.6.2	Monitor, 21", with cable			1.0	ea.	1,380			1,380		VQ	IH	EQ	OR	LI	1,517	X1	30
1.9.8.6.2	Sun Ultra 5 Workstation			1.0	ea.	3,720			3,720		VQ	IH	EQ	OR	LI	4,088	X1	30
1.9.8.6.2	Memory expansion for Sun Ultra 5			1.0	ea.	825			825		VQ	IH	EQ	OR	LI	907	X1	30
1.9.8.6.3	Title III Engineering						40	62.90	2,516	SNS_TSM	EJ	IH	T2	OR	LI	3,030	X0	30
1.9.8.6.4	Software, EMS display screens						80	62.90	5,032	SNS_TSM	EJ	IH	T2	OR	LI	6,061	X0	30
1.9.8.6.7	Checkout, engr.						8	62.90	503	SNS_TSM	EJ	IH	T2	OR	LI	606	X0	30
1.9.8.6.7	Checkout, tech.						8	62.90	503	SNS_TSM	EJ	IH	T2	OR	LI	606	X0	30
1.9.9	***Personnel Protection***								3,635,388							4,159,874		
1.9.9.1	***Accelerator Personnel Protection***								1,768,434							2,036,516		
1.9.9.1.1	ORNL Engineering (34400070),				HR		4300	62.65	269,395	ORLA-ORNL	EJ	IH	T2	OR	LI	324,621	X0	30
1.9.9.1.1	consultant to peer review PPS design,				HR		80	100.00	8,000	ORLA-PPS C	EJ	IH	T2	OR	LI	8,235	X0	30
1.9.9.1.2	PLC Power Supply, following equipment required for PLC			1.0	EA	460			460	ORMA-PLC P	CP	SC	MA	OR	LI	506	X1	30
1.9.9.1.2	PLC Rack, 10 Slot,			1.0	EA	310			310	ORMA-PLC R	CP	SC	MA	OR	LI	341	X1	30
1.9.9.1.2	Input Mod, 16 DI,			2.0	EA	270			540	ORMA-PLC D	CP	SC	MA	OR	LI	593	X1	30
1.9.9.1.2	Output Mod, 16 DO, relay,			2.0	EA	411			822	ORMA-PLC D	CP	SC	MA	OR	LI	903	X1	30
1.9.9.1.2	PLC Software,			1.0	EA	3,000			3,000	ORMA-PLC S	CP	SC	MA	OR	LI	3,297	X2	30
1.9.9.1.2	PLC Processor,			1.0	EA	3,000			3,000	ORMA-PLC P	CP	SC	MA	OR	LI	3,297	X2	30
1.9.9.1.2	Rack, Instrument,			1.0	EA	1,000			1,000	ORMA-RK IN	CP	SC	MA	OR	LI	1,099	X1	30

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1.9.9.1.2	Comm Mod,			1.0	EA	1,100			1,100	ORMA-PLC C	CP	SC	MA	OR	LI	1,209	X1	30
1.9.9.1.2	Beam Shutdown Station,			1.0	EA	1,350			1,350	ORMA-PPS B	CP	SC	MA	OR	LI	1,484	X1	30
1.9.9.1.2	Key Exch Master Block,			1.0	EA	600			600	ORMA-PPS K	CP	SC	MA	OR	LI	659	X1	30
1.9.9.1.2	Key Exch, Slave Block, 10 Keys,			1.0	EA	1,200			1,200	ORMA-PPS K	CP	SC	MA	OR	LI	1,319	X1	30
1.9.9.1.2	Alphanumeric Display,			1.0	EA	800			800	ORMA-PPS A	CP	SC	MA	OR	LI	879	X1	30
1.9.9.1.2	Computer, PC, for WonderWare s/w,			1.0	EA	2,000			2,000	ORMA-WKST	CP	SC	MA	OR	LI	2,198	X2	30
1.9.9.1.2	Software, WonderWare Development,			1.0	EA	7,500			7,500	ORMA-PPS S	CP	SC	MA	OR	LI	8,243	X2	30
1.9.9.1.2	Panel, Test (Input Switches & LED's),			1.0	EA	650			650	ORMA-PPS P	CP	SC	MA	OR	LI	714	X1	30
1.9.9.1.2	Power Supply, 24 VDC, 10A,			1.0	EA	350			350	ORMA-PPS P	CP	SC	MA	OR	LI	385	X1	30
1.9.9.1.2	Terminal Strips, Wiring,			1.0	LOT	750			750	ORMA-PPS T	EJ	SC	MA	OR	LI	824	X1	30
1.9.9.1.2	Training, PLC Software,			1.0	LOT	3,000			3,000	ORMA-PPS T	EJ	SC	MA	OR	LI	3,297	X0	30
1.9.9.1.2	Training, WonderWare,			1.0	LOT	3,000			3,000	ORMA-PPS T	EJ	SC	MA	OR	LI	3,297	X0	30
1.9.9.1.2	Master control rack for front end beam cutoff & fe contain			1.0	EA	69,831			69,831	ORMA-PPS F	EJ	SC	MA	OR	LI	76,744	X2	30
1.9.9.1.2	Beam Shutdown Station,			1.0	EA	1,350			1,350	ORMA-PPS B	EJ	SC	MA	OR	LI	1,484	X1	30
1.9.9.1.2	Limit Switch, Magnetic, The following equipment is for a e			2.0	EA	120			240	ORMA-PPS L	CP	SC	MA	OR	LI	264	X1	30
1.9.9.1.2	Alphanumeric Display,			1.0	EA	800			800	ORMA-PPS A	EJ	SC	MA	OR	LI	879	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			1.0	EA	250			250	ORMA-PPS R	CP	SC	MA	OR	LI	275	X1	30
1.9.9.1.2	Crash Bar, for use with mag locks,			1.0	EA	275			275	ORMA-PPS C	CP	SC	MA	OR	LI	302	X1	30
1.9.9.1.2	Magnetic Lock, w/Strike Plate,			1.0	EA	350			350	ORMA-PPS	CP	SC	MA	OR	LI	385	X1	30
1.9.9.1.2	Camera, CCTV, B&W, w/Fixed Mount,			1.0	EA	500			500	ORMA-CCTV	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Intercom call box,			1.0	EA	250			250	ORMA-INTC	CP	SC	MA	OR	LI	275	X1	30
1.9.9.1.2	PLC rack for standard single entrance door,			1.0	EA	22,820			22,820	ORMA-PPS R	EJ	SC	MA	OR	LI	25,079	X2	30
1.9.9.1.2	Gamma- Neutron Detector,			1.0	EA	15,000			15,000	ORMA-DET R	CP	SC	MA	OR	LI	16,485	X2	30
1.9.9.1.2	Temp. control panel for FE control room,			1.0	EA	20,000			20,000	ORMA-PPS T	EJ	SC	MA	OR	LI	21,980	X2	30
1.9.9.1.2	Limit Switch, Magnetic, The following equipment is require			12.0	EA	120			1,440	ORMA-PPS L	CP	SC	MA	OR	LI	1,583	X1	30
1.9.9.1.2	Alphanumeric Display,			2.0	EA	800			1,600	ORMA-PPS A	EJ	SC	MA	OR	LI	1,758	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			2.0	EA	250			500	ORMA-PPS R	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Crash Bar, for use with mag locks,			6.0	EA	275			1,650	ORMA-PPS C	CP	SC	MA	OR	LI	1,813	X1	30
1.9.9.1.2	Magnetic Lock, w/Strike Plate,			6.0	EA	350			2,100	ORMA-PPS	CP	SC	MA	OR	LI	2,308	X1	30
1.9.9.1.2	Camera, CCTV, B&W, w/Fixed Mount,			2.0	EA	500			1,000	ORMA-CCTV	CP	SC	MA	OR	LI	1,099	X1	30
1.9.9.1.2	Intercom call box,			2.0	EA	250			500	ORMA-INTC	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Key Exch Master Block,			2.0	EA	600			1,200	ORMA-PPS K	CP	SC	MA	OR	LI	1,319	X1	30
1.9.9.1.2	Key Exch, Slave Block, 10 Keys,			2.0	EA	1,200			2,400	ORMA-PPS K	CP	SC	MA	OR	LI	2,638	X1	30
1.9.9.1.2	PLC rack for standard double entrance door,			2.0	EA	27,920			55,840	ORMA-PPS R	EJ	SC	MA	OR	LI	61,368	X2	30
1.9.9.1.2	Limit Switch, Magnetic, Following equipment required for a			4.0	EA	120			480	ORMA-PPS L	CP	SC	MA	OR	LI	528	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			2.0	EA	250			500	ORMA-PPS R	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Crash switch for sissors gate,			2.0	EA	100			200	ORMA-PPS S	EJ	SC	MA	OR	LI	220	X1	30
1.9.9.1.2	Magnetic Lock, w/Strike Plate,			1.0	EA	350			350	ORMA-PPS	CP	SC	MA	OR	LI	385	X1	30
1.9.9.1.2	Gamma- Neutron Detector,			1.0	EA	15,000			15,000	ORMA-DET R	CP	SC	MA	OR	LI	16,485	X2	30
1.9.9.1.2	PLC rack for 400 MHz RF control,			1.0	EA	20,781			20,781	ORMA-PPS R	EJ	SC	MA	OR	LI	22,838	X2	30
1.9.9.1.2	Beam Shutdown Station,			4.0	EA	1,350			5,400	ORMA-PPS B	EJ	SC	MA	OR	LI	5,935	X1	30
1.9.9.1.2	Limit Switch, Magnetic, Following equipment required for t			12.0	EA	120			1,440	ORMA-PPS L	CP	SC	MA	OR	LI	1,583	X1	30
1.9.9.1.2	Alphanumeric Display,			2.0	EA	800			1,600	ORMA-PPS A	EJ	SC	MA	OR	LI	1,758	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			2.0	EA	250			500	ORMA-PPS R	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Crash Bar, for use with mag locks,			6.0	EA	275			1,650	ORMA-PPS C	CP	SC	MA	OR	LI	1,813	X1	30

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1.9.9.1.2	Magnetic Lock, w/Strike Plate,			6.0	EA	350			2,100	ORMA-PPS	CP	SC	MA	OR	LI	2,308	X1	30
1.9.9.1.2	Camera, CCTV, B&W, w/Fixed Mount,			2.0	EA	500			1,000	ORMA-CCTV	CP	SC	MA	OR	LI	1,099	X1	30
1.9.9.1.2	Intercom call box,			2.0	EA	250			500	ORMA-INTC	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Key Exch Master Block,			2.0	EA	600			1,200	ORMA-PPS K	CP	SC	MA	OR	LI	1,319	X1	30
1.9.9.1.2	Key Exch, Slave Block, 10 Keys,			2.0	EA	1,200			2,400	ORMA-PPS K	CP	SC	MA	OR	LI	2,638	X1	30
1.9.9.1.2	PLC rack for standard double entrance door,			2.0	EA	27,920			55,840	ORMA-PPS R	EJ	SC	MA	OR	LI	61,368	X2	30
1.9.9.1.2	PLC rack for 800 MHz RF control,			1.0	EA	20,781			20,781	ORMA-PPS R	EJ	SC	MA	OR	LI	22,838	X2	30
1.9.9.1.2	Beam Shutdown Station,			18.0	EA	1,350			24,300	ORMA-PPS B	EJ	SC	MA	OR	LI	26,706	X1	30
1.9.9.1.2	Limit Switch, Magnetic, Following equipment required for			18.0	EA	120			2,160	ORMA-PPS L	CP	SC	MA	OR	LI	2,374	X1	30
1.9.9.1.2	Alphanumeric Display,			3.0	EA	800			2,400	ORMA-PPS A	EJ	SC	MA	OR	LI	2,638	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			3.0	EA	250			750	ORMA-PPS R	CP	SC	MA	OR	LI	824	X1	30
1.9.9.1.2	Crash Bar, for use with mag locks,			9.0	EA	275			2,475	ORMA-PPS C	CP	SC	MA	OR	LI	2,720	X1	30
1.9.9.1.2	Magnetic Lock, w/Strike Plate,			9.0	EA	350			3,150	ORMA-PPS	CP	SC	MA	OR	LI	3,462	X1	30
1.9.9.1.2	Camera, CCTV, B&W, w/Fixed Mount,			3.0	EA	500			1,500	ORMA-CCTV	CP	SC	MA	OR	LI	1,649	X1	30
1.9.9.1.2	Intercom call box,			3.0	EA	250			750	ORMA-INTC	CP	SC	MA	OR	LI	824	X1	30
1.9.9.1.2	Key Exch Master Block,			3.0	EA	600			1,800	ORMA-PPS K	CP	SC	MA	OR	LI	1,978	X1	30
1.9.9.1.2	Key Exch, Slave Block, 10 Keys,			3.0	EA	1,200			3,600	ORMA-PPS K	CP	SC	MA	OR	LI	3,956	X1	30
1.9.9.1.2	PLC rack for standard double entrance door,			3.0	EA	27,920			83,760	ORMA-PPS R	EJ	SC	MA	OR	LI	92,052	X2	30
1.9.9.1.2	Limit Switch, Magnetic, following equipment required for 1			4.0	EA	120			480	ORMA-PPS L	CP	SC	MA	OR	LI	528	X1	30
1.9.9.1.2	Rotating Beacon, Magenta,			2.0	EA	250			500	ORMA-PPS R	CP	SC	MA	OR	LI	550	X1	30
1.9.9.1.2	Crash switch for sissors gate,			2.0	EA	100			200	ORMA-PPS S	EJ	SC	MA	OR	LI	220	X1	30
1.9.9.1.2	Magnetic Lock, w/Strike Plate,			1.0	EA	350			350	ORMA-PPS	CP	SC	MA	OR	LI	385	X1	30
1.9.9.1.2	Gamma- Neutron Detector,			1.0	EA	15,000			15,000	ORMA-DET R	CP	SC	MA	OR	LI	16,485	X2	30
1.9.9.1.2	PLC equipment rack for beam containment functions in rin			1.0	EA	20,781			20,781	ORMA-PPS R	EJ	SC	MA	OR	LI	22,838	X2	30
1.9.9.1.2	Beam Shutdown Station,			22.0	EA	1,350			29,700	ORMA-PPS B	EJ	SC	MA	OR	LI	32,640	X1	30
1.9.9.1.2	Gamma radiation detector, Following equipment required f			4.0	EA	7,500			30,000	ORMA-DET R	CP	SC	MA	OR	LI	32,970	X2	30
1.9.9.1.2	Outdoor electrical panel,			4.0	EA	300			1,200	ORMA-PNL E	EJ	SC	MA	OR	LI	1,319	X1	30
1.9.9.1.2	Limit Switch, Magnetic, For ring equipment door			2.0	EA	120			240	ORMA-PPS L	CP	SC	MA	OR	LI	264	X1	30
1.9.9.1.2	Gate or door lock for key exchange system, for movable sh			6.0	EA	200			1,200	ORMA-PPS K	EJ	SC	MA	OR	LI	1,319	X1	30
1.9.9.1.2	Control Room computer based operator interface, Followin			3.0	EA	9,560			28,680	ORMA-PPS O	EJ	SC	MA	OR	LI	31,519	X2	30
1.9.9.1.2	PPS control room access control console, CCTV & interco			1.0	EA	14,350			14,350	ORMA-PPS A	EJ	SC	MA	OR	LI	15,771	X2	30
1.9.9.1.2	PPS hardwired operator interface console,			1.0	EA	14,300			14,300	ORMA-PPS H	EJ	SC	MA	OR	LI	15,716	X2	30
1.9.9.1.2	PPS control room programmer's console,			2.0	EA	7,880			15,760	ORMA-PPS P	EJ	SC	MA	OR	LI	17,320	X2	30
1.9.9.1.2	PPS control room test console,			2.0	EA	20,000			40,000	ORMA-PPS T	EJ	SC	MA	OR	LI	43,960	X2	30
1.9.9.1.2	PPS PLC equipment rack for LINAC in control building equi			2.0	EA	36,900			73,800	ORMA-PPS R	EJ	SC	MA	OR	LI	81,106	X2	30
1.9.9.1.2	PPS PLC equipment rack for ring in control building equip			1.0	EA	36,900			36,900	ORMA-PPS R	EJ	SC	MA	OR	LI	40,553	X2	30
1.9.9.1.2	allowance for consumables during construction,			25.0	LOT	500			12,500	ORMA-ALW	EJ	CM	MA	OR	LI	13,738	X1	25
1.9.9.1.2.2A	IOC system hardware,			1.0	LOT	13,310			13,310	ORMA-GC IO	VQ	SC	MA	OR	LI	14,628	X1	30
1.9.9.1.2.2A	Equipment rack for IOC,			1.0	EA	2,446			2,446	ORMA-GC IO	VQ	SC	MA	OR	LI	2,688	X2	30
1.9.9.1.3	ORNL Engineering (34400070),				HR		1310	62.65	82,072	ORLA-ORNL	EJ	IH	T3	OR	LI	98,896	X0	30
1.9.9.1.3.3A	ORNL Engineering (34400070),				HR		54	62.65	3,383	ORLA-ORNL	EJ	IH	T3	OR	LI	4,077	X0	30
1.9.9.1.4	ORNL Engineering (34400070),				HR		2400	62.65	150,360	ORLA-ORNL	EJ	IH	SW	OR	LI	181,184	X0	30
1.9.9.1.4	consultant to peer review PPS design,				HR	0	0	100.00	0	ORLA-PPS C	EJ	IH	SW	OR	LI	0	X0	30
1.9.9.1.4.4A	ORNL Engineering (34400070),				HR		1750	62.65	109,638	ORLA-ORNL	EJ	IH	SW	OR	LI	132,113	X0	30
1.9.9.1.4.4A	I&C R&D Exempt, develop software driver for rad monitor i				HR		240	84.12	20,189	ORLA-ORNL	EJ	IH	SW	OR	LI	24,328	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.9.1.5	Physics division technician, For fabrication of developmen				HR		80	29.96	2,397	ORLA-PHYSI	EJ	IH	LA	OR	LI	2,888	X0	30
1.9.9.1.5.5A	Physics division technician,				HR		40	29.96	1,198	ORLA-PHYSI	EJ	IH	LA	OR	LI	1,444	X0	30
1.9.9.1.6	P&E electrical maintenance, for installation of front end eq				HR		167	48.86	8,160	ORLA-P&EEL	EJ	IH	IN	OR	LI	9,832	X0	30
1.9.9.1.6	Res & Fac Services A (30760000),				HR		8	48.86	391	ORLA-P&ER	EJ	IH	IN	OR	LI	471	X0	30
1.9.9.1.6	P&E electrical maintenance, for installation of DTL, CCDTL				HR		291	48.86	14,218	ORLA-P&EEL	EJ	IH	IN	OR	LI	17,133	X0	30
1.9.9.1.6	Res & Fac Services A (30760000),				HR		12	48.86	586	ORLA-P&ER	EJ	IH	IN	OR	LI	707	X0	30
1.9.9.1.6	P&E electrical maintenance, for installation of equipment i				HR		328	48.86	16,026	ORLA-P&EEL	EJ	IH	IN	OR	LI	19,311	X0	30
1.9.9.1.6	Res & Fac Services A (30760000),				HR		4	48.86	195	ORLA-P&ER	EJ	IH	IN	OR	LI	236	X0	30
1.9.9.1.6	P&E electrical maintenance, for installation of equipment i				HR		480	48.86	23,453	ORLA-P&EEL	EJ	IH	IN	OR	LI	28,261	X0	30
1.9.9.1.6	Res & Fac Services A (30760000),				HR		14	48.86	684	ORLA-P&ER	EJ	IH	IN	OR	LI	824	X0	30
1.9.9.1.6	P&E electrical maintenance, installation of outdoor radiatio				HR		80	48.86	3,909	ORLA-P&EEL	EJ	IH	IN	OR	LI	4,710	X0	30
1.9.9.1.6	Res & Fac Services A (30760000),				HR		50	48.86	2,443	ORLA-P&ER	EJ	IH	IN	OR	LI	2,944	X0	30
1.9.9.1.6	P&E electrical maintenance, for installation of equipment i				HR		460	48.86	22,476	ORLA-P&EEL	EJ	IH	IN	OR	LI	27,083	X0	30
1.9.9.1.6	SNS technician, for supervision of ORNL crafts & equipme				HR		200	29.96	5,992	ORLA-SNST	EJ	IH	IN	OR	LI	7,220	X0	30
1.9.9.1.6	ORNL Engineering (34400070), supervision of ORNL techs.				HR		80	62.65	5,012	ORLA-ORNL	EJ	IH	IN	OR	LI	6,039	X0	30
1.9.9.1.6	Res & Fac Services A (30760000), allowance for clean up, e				HR		225	48.86	10,994	ORLA-P&ER	EJ	IH	IN	OR	LI	13,247	X0	30
1.9.9.1.6.6A	AE/CM Managed Craft - Electrician, for installation of front				HR		8	38.90	311	ORLA-DBELE	EJ	CM	IN	OR	LI	320	X0	30
1.9.9.1.7	ORNL Engineering (34400070),				HR		1200	62.65	75,180	ORLA-ORNL	EJ	IH	T3	OR	LI	90,592	X0	30
1.9.9.1.7	SNS technician,				HR		1200	29.96	35,952	ORLA-SNST	EJ	IH	T3	OR	LI	43,322	X0	30
1.9.9.1.7.7A	ORNL Engineering (34400070),				HR		250	62.65	15,663	ORLA-ORNL	EJ	IH	T3	OR	LI	18,873	X0	30
1.9.9.1.7.7A	Physics division technician,				HR		250	29.96	7,490	ORLA-PHYSI	EJ	IH	T3	OR	LI	9,025	X0	30
1.9.9.1.9	ORNL Travel,			10.0	LOT	2,000			20,000	ORTR-TRAV	EJ	SC	MA	OR	LI	20,300	X0	30
1.9.9.1.1A	ORNL Engineering (34400070),				HR		80	62.65	5,012	ORLA-ORNL	EJ	IH	T2	OR	LI	6,039	X0	30
1.9.9.1.1A	ORNL Engineering (34400070),				HR		100	62.65	6,265	ORLA-ORNL	EJ	IH	T2	OR	LI	7,549	X0	30
1.9.9.2	***Target Facility Personnel Protection***								1,291,831							1,476,015		
1.9.9.2.1	ORNL Engineering (34400070),				HR		2940	62.65	184,191	ORLA-ORNL	EJ	IH	T2	OR	LI	221,950	X0	30
1.9.9.2.1	consultant to peer review PPS design,				HR		80	100.00	8,000	ORLA-PPS C	EJ	IH	T2	OR	LI	8,235	X0	30
1.9.9.2.2	Gamma- Neutron Detector, 10 for target experiment area (o			10.0	EA	15,000			150,000	ORMA-DET R	CP	SC	MA	OR	LI	164,850	X2	30
1.9.9.2.2	Monitron radiation detectors, For radiation monitoring in hi			8.0		2,000			16,000	ORMA-HP M	EJ	SC	MA	OR	LI	17,584	X2	30
1.9.9.2.2	Radiation detector system, high realiability, for TPPS, One			2.0	EA	35,000			70,000	ORMA-DET R	EJ	SC	MA	OR	LI	76,930	X2	30
1.9.9.2.2	TPPS warning horn and light system,			1.0	LOT	8,500			8,500	ORMA-TPPS	EJ	SC	MA	OR	LI	9,342	X1	30
1.9.9.2.2	Target PLC rack for APPS & TPPS functions,			1.0	EA	30,000			30,000	ORMA-TAR R	EJ	SC	MA	OR	LI	32,970	X2	30
1.9.9.2.2	Limit Switch, Magnetic, following equipment required for o			2.0	EA	120			240	ORMA-PPS L	CP	SC	MA	OR	LI	264	X1	30
1.9.9.2.2	Alphanumeric Display,			1.0	EA	800			800	ORMA-PPS A	EJ	SC	MA	OR	LI	879	X1	30
1.9.9.2.2	Rotating Beacon, Magenta,			1.0	EA	250			250	ORMA-PPS R	CP	SC	MA	OR	LI	275	X1	30
1.9.9.2.2	Crash Bar, for use with mag locks,			1.0	EA	275			275	ORMA-PPS C	CP	SC	MA	OR	LI	302	X1	30
1.9.9.2.2	Magnetic Lock, w/Strike Plate,			1.0	EA	350			350	ORMA-PPS	CP	SC	MA	OR	LI	385	X1	30
1.9.9.2.2	Camera, CCTV, B&W, w/Fixed Mount,			1.0	EA	500			500	ORMA-CCTV	CP	SC	MA	OR	LI	550	X1	30
1.9.9.2.2	Intercom call box,			1.0	EA	250			250	ORMA-INTC	CP	SC	MA	OR	LI	275	X1	30
1.9.9.2.2	PLC rack for standard single entrance door,			1.0	EA	22,820			22,820	ORMA-PPS R	EJ	SC	MA	OR	LI	25,079	X2	30
1.9.9.2.2	Limit Switch, Magnetic, following required for one double e			6.0	EA	120			720	ORMA-PPS L	CP	SC	MA	OR	LI	791	X1	30
1.9.9.2.2	Alphanumeric Display,			1.0	EA	800			800	ORMA-PPS A	EJ	SC	MA	OR	LI	879	X1	30
1.9.9.2.2	Rotating Beacon, Magenta,			1.0	EA	250			250	ORMA-PPS R	CP	SC	MA	OR	LI	275	X1	30
1.9.9.2.2	Crash Bar, for use with mag locks,			3.0	EA	275			825	ORMA-PPS C	CP	SC	MA	OR	LI	907	X1	30
1.9.9.2.2	Magnetic Lock, w/Strike Plate,			3.0	EA	350			1,050	ORMA-PPS	CP	SC	MA	OR	LI	1,154	X1	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.9.2.2	Camera, CCTV, B&W, w/Fixed Mount,			1.0	EA	500			500	ORMA-CCTV	CP	SC	MA	OR	LI	550	X1	30
1.9.9.2.2	Intercom call box,			1.0	EA	250			250	ORMA-INTC	CP	SC	MA	OR	LI	275	X1	30
1.9.9.2.2	Key Exch Master Block,			1.0	EA	600			600	ORMA-PPS K	CP	SC	MA	OR	LI	659	X1	30
1.9.9.2.2	Key Exch, Slave Block, 10 Keys,			1.0	EA	1,200			1,200	ORMA-PPS K	CP	SC	MA	OR	LI	1,319	X1	30
1.9.9.2.2	PLC rack for standard double entrance door,			1.0	EA	27,920			27,920	ORMA-PPS R	EJ	SC	MA	OR	LI	30,684	X2	30
1.9.9.2.2	Limit Switch, Magnetic, following equipment required for 2			8.0	EA	120			960	ORMA-PPS L	CP	SC	MA	OR	LI	1,055	X1	30
1.9.9.2.2	Rotating Beacon, Magenta,			4.0	EA	250			1,000	ORMA-PPS R	CP	SC	MA	OR	LI	1,099	X1	30
1.9.9.2.2	Crash switch for sissors gate,			4.0	EA	100			400	ORMA-PPS S	EJ	SC	MA	OR	LI	440	X1	30
1.9.9.2.2	Magnetic Lock, w/Strike Plate,			2.0	EA	350			700	ORMA-PPS	CP	SC	MA	OR	LI	769	X1	30
1.9.9.2.2	Target PLC rack for IPPS functions,			1.0	EA	30,000			30,000	ORMA-TAR R	EJ	SC	MA	OR	LI	32,970	X2	30
1.9.9.2.2	PLC panel for individual instrument PPS, following equipm			3.0	EA	6,000			18,000	ORMA-TAR P	EJ	SC	MA	OR	LI	19,782	X2	30
1.9.9.2.2	Key lock switch for exper. shutter control,			3.0	EA	850			2,550	ORMA-IPPS	EJ	SC	MA	OR	LI	2,802	X1	30
1.9.9.2.2	Beam Shutdown Station,			3.0	EA	1,350			4,050	ORMA-PPS B	EJ	SC	MA	OR	LI	4,451	X1	30
1.9.9.2.2	Rotating Beacon, Magenta,			3.0	EA	250			750	ORMA-PPS R	CP	SC	MA	OR	LI	824	X1	30
1.9.9.2.2	magnetic limit switch, tamper proof,			6.0	EA	560			3,360	ORMA-PPS L	CP	SC	MA	OR	LI	3,693	X1	30
1.9.9.2.2	Magnetic Lock, w/Strike Plate,			3.0	EA	350			1,050	ORMA-PPS	CP	SC	MA	OR	LI	1,154	X1	30
1.9.9.2.2	Crash Bar, for use with mag locks,			3.0	EA	275			825	ORMA-PPS C	CP	SC	MA	OR	LI	907	X1	30
1.9.9.2.2	Gate or door lock for key exchange system,			36.0	EA	200			7,200	ORMA-PPS K	EJ	SC	MA	OR	LI	7,913	X1	30
1.9.9.2.2	Key exch., slave block, 2 keys,			3.0	EA	440			1,320	ORMA-PPS K	CP	SC	MA	OR	LI	1,451	X1	30
1.9.9.2.2	Key exchange system for target shutter power & beam line			3.0	EA	12,000			36,000	ORMA-TAR S	EJ	SC	MA	OR	LI	39,564	X2	30
1.9.9.2.2	Key Exch, Slave Block, 10 Keys,			3.0	EA	1,200			3,600	ORMA-PPS K	CP	SC	MA	OR	LI	3,956	X1	30
1.9.9.2.2	PLC panel for individual instrument PPS, following equipm			7.0	EA	6,000			42,000	ORMA-TAR P	EJ	SC	MA	OR	LI	46,158	X2	30
1.9.9.2.2	Key lock switch for exper. shutter control,			7.0	EA	850			5,950	ORMA-IPPS	EJ	SC	MA	OR	LI	6,539	X1	30
1.9.9.2.2	Rotating Beacon, Magenta,			7.0	EA	250			1,750	ORMA-PPS R	CP	SC	MA	OR	LI	1,923	X1	30
1.9.9.2.2	magnetic limit switch, tamper proof,			42.0	EA	560			23,520	ORMA-PPS L	CP	SC	MA	OR	LI	25,848	X1	30
1.9.9.2.2	Gate or door lock for key exchange system,			91.0	EA	200			18,200	ORMA-PPS K	EJ	SC	MA	OR	LI	20,002	X1	30
1.9.9.2.2	Key exch., slave block, 2 keys,			7.0	EA	440			3,080	ORMA-PPS K	CP	SC	MA	OR	LI	3,385	X1	30
1.9.9.2.2	Key exchange system for target shutter power & beam line			7.0	EA	12,000			84,000	ORMA-TAR S	EJ	SC	MA	OR	LI	92,316	X2	30
1.9.9.2.2	Key Exch, Slave Block, 10 Keys,			7.0	EA	1,200			8,400	ORMA-PPS K	CP	SC	MA	OR	LI	9,232	X1	30
1.9.9.2.2	allowance for consumables during construction,			20.0	LOT	500			10,000	ORMA-ALW	EJ	CM	MA	OR	LI	10,990	X1	25
1.9.9.2.2	PPS control room access control console, CCTV & interco			1.0	EA	14,350			14,350	ORMA-PPS A	EJ	SC	MA	OR	LI	15,771	X2	30
1.9.9.2.2	PPS control room programmer's console,			1.0	EA	7,880			7,880	ORMA-PPS P	EJ	SC	MA	OR	LI	8,660	X2	30
1.9.9.2.2	Control Room computer based operator interface,			2.0	EA	9,560			19,120	ORMA-PPS O	EJ	SC	MA	OR	LI	21,013	X2	30
1.9.9.2.2	PPS hardwired operator interface console,			1.0	EA	14,300			14,300	ORMA-PPS H	EJ	SC	MA	OR	LI	15,716	X2	30
1.9.9.2.3	ORNL Engineering (34400070),				HR		920	62.65	57,638	ORLA-ORNL	EJ	IH	T3	OR	LI	69,454	X0	30
1.9.9.2.4	ORNL Engineering (34400070),				HR		1550	62.65	97,108	ORLA-ORNL	EJ	IH	SW	OR	LI	117,015	X0	30
1.9.9.2.4	consultant to peer review PPS design,				HR		80	100.00	8,000	ORLA-PPS C	EJ	IH	SW	OR	LI	8,235	X0	30
1.9.9.2.6	P&E electrical maintenance,				HR		1958	48.86	95,668	ORLA-P&EEL	EJ	CM	IN	OR	LI	115,280	X0	30
1.9.9.2.6	ORNL Engineering (34400070), supervision of ORNL techs.				HR		80	62.65	5,012	ORLA-ORNL	EJ	CM	IN	OR	LI	6,039	X0	30
1.9.9.2.6	SNS technician,				HR		200	29.96	5,992	ORLA-SNST	EJ	CM	IN	OR	LI	7,220	X0	30
1.9.9.2.6	P&E electrical maintenance, allowance for clean up, etc.				HR		300	48.86	14,658	ORLA-P&EEL	EJ	CM	IN	OR	LI	17,663	X0	30
1.9.9.2.6	Res & Fac Services A (30760000),				HR		472	48.86	23,062	ORLA-P&ER	EJ	CM	IN	OR	LI	27,790	X0	30
1.9.9.2.7	ORNL Engineering (34400070),				HR		800	62.65	50,120	ORLA-ORNL	EJ	IH	T3	OR	LI	60,395	X0	30
1.9.9.2.7	SNS technician,				HR		800	29.96	23,968	ORLA-SNST	EJ	IH	T3	OR	LI	28,881	X0	30
1.9.9.2.9	ORNL Travel,			10.0	LOT	2,000			20,000	ORTR-TRAV	EJ	SC	MA	OR	LI	20,300	X0	30

WBS	Item	Components No.	Components Cost	Materials/Equipment Qty	Materials/Equipment Unit	Materials/Equipment Unit Cost	Labor Hrs	Labor Rate	UnBurdened Cost	Labor Code	Basis Code	Acq. Code	Res. Code	Part. Code	FT	Burdened Cost	Tax Code	Cont. %
1.9.9.3	***Health Physics Instruments and Stack Mont.***								575,123							647,343		
1.9.9.3.1	**ORNL Engineering (34400070),**				HR		1280	62.65	80,192	ORLA-ORNL	EJ	IH	T2	OR	LI	96,631	X0	30
1.9.9.3.2	**TLD Gamma Dosimeter,**			300.0	EA	24			7,050	ORMA-HP TL	EJ	SC	MA	OR	LI	7,748	X1	30
1.9.9.3.2	**TLD Neutron Dosimeter,**			150.0	EA	107			16,013	ORMA-HP TL	EJ	SC	MA	OR	LI	17,598	X1	30
1.9.9.3.2	**Electronic Dosimeters for Use w/Badge Reader,**			100.0	EA	400			40,000	ORMA-HP D	VQ	SC	MA	OR	LI	43,960	X1	30
1.9.9.3.2	**Badge/Dosimeter Reader, Ethernet Communications to Ce**			17.0	EA	5,000			85,000	ORMA-HP BA	VQ	SC	MA	OR	LI	93,415	X2	30
1.9.9.3.2	**Rack for Mounting Item 4,**			17.0	EA	200			3,400	ORMA-HP RK	EJ	SC	MA	OR	LI	3,737	X1	30
1.9.9.3.2	**Smear Counters,**			2.0	EA	7,500			15,000	ORMA-HP S	VQ	SC	MA	OR	LI	16,485	X2	30
1.9.9.3.2	**Portable instruments for RCT's,**			1.0	LOT	60,000			60,000	ORMA-HP IN	EJ	SC	MA	OR	LI	65,940	X1	30
1.9.9.3.2	**Monitor, Hand & Foot,**			7.0	EA	2,500			17,500	ORMA-HP M	VQ	SC	MA	OR	LI	19,233	X2	30
1.9.9.3.2	**NESHAPS permit stack sampling system,**			1.0	EA	80,000			80,000	ORMA-STK S	EJ	SC	MA	OR	LI	87,920	X2	30
1.9.9.3.2	**Platform stack, for Stack Sampling System,**			1.0	EA	25,000			25,000	ORMA-STK P	EJ	SC	MA	OR	LI	27,475	X2	30
1.9.9.3.2	**Ladder, caged, for Stack Sampling System Platform,**			1.0	EA	10,000			10,000	ORMA-STK L	EJ	SC	MA	OR	LI	10,990	X2	30
1.9.9.3.2	**allowance for consumables during construction,**			6.0	LOT	500			3,000	ORMA-ALW	EJ	CM	MA	OR	LI	3,297	X1	25
1.9.9.3.2	**Liquid scintillation counter,**			1.0	EA	20,000			20,000	ORMA-HP SC	EJ	SC	MA	OR	LI	21,980	X2	30
1.9.9.3.3	**ORNL Engineering (34400070),**				HR		380	62.65	23,807	ORLA-ORNL	EJ	IH	T3	OR	LI	28,687	X0	30
1.9.9.3.6	**SNS technician,**				HR		188	29.96	5,632	ORLA-SNST	EJ	CM	IN	OR	LI	6,787	X0	30
1.9.9.3.6	**SNS technician, allowance for clean up, etc.**				HR		24	29.96	719	ORLA-SNST	EJ	CM	IN	OR	LI	866	X0	30
1.9.9.3.6	**ORNL Engineering (34400070), supervision of ORNL techs.**				HR		26	62.65	1,629	ORLA-ORNL	EJ	CM	IN	OR	LI	1,963	X0	30
1.9.9.3.6	**AE/CM Managed Craft - Iron Worker,**				HR		385	45.40	17,479	ORLA-DBIRO	EJ	CM	IN	OR	LI	17,993	X0	30
1.9.9.3.6	**20 ton truck mounted crane w/ crew,**			40.0	HR	150			6,000	ORMA-CRAN	EJ	CM	IN	OR	LI	6,176	X1	30
1.9.9.3.6	**AE/CM Managed Craft - Average Rate, allowance for safety**				HR		71	40.00	2,840	ORLA-DBAV	EJ	CM	IN	OR	LI	2,923	X0	30
1.9.9.3.7	**ORNL Engineering (34400070),**				HR		560	62.65	35,084	ORLA-ORNL	EJ	IH	T3	OR	EX	42,276	X0	30
1.9.9.3.7	**SNS technician,**				HR		560	29.96	16,778	ORLA-SNST	EJ	IH	T3	OR	EX	20,217	X0	30
1.9.9.3.9	**ORNL Travel,**			1.5	LOT	2,000			3,000	ORTR-TRAV	EJ	SC	MA	OR	LI	3,045	X0	30