NCSX Project Control System

Ron Strykowsky

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Overview

- **Integrated resource planning, work authorization and performance measurement system in place at PPPL since 1983**

- **PPPL's PCS system description documented and approved 1996** *Example A*
  - **Graded approach**
  - **Earned value management system**
  - **Changes since 1996**
    - **More PC based reports improved flexibility and usefulness (WAF's, labor profiles, CPR's)**
    - **Primavera barcharts more useful; used for estimating and "what-if" exercises.**
    - **Earned Value computations; percent complete can now be applied at the subtask level (individual resource estimate).**
    - **Formal variance analysis reports successfully replaced by monthly progress reporting sit-down meetings.**
- **Projects**
  - **TFTR Upgrades**
  - **TFTR D-T Prep**
  - **NSTX Construction**
  - **NSTX Neutral Beam Upgrade**
  - **TFTR D&D**
  - **NCSX Construction**

Project Management Objectives

- Organization of the work effort through the WBS structure.
- Assignment of responsibilities and accountability for work scope via integration of the OBS and WBS.
- Process for planning and estimating work in support of DOE funding and PPPL Project Milestones. (also supports FWP and "what-if" exercises).
- Process for the Authorization of work.
- Process for monitoring work progress and costs through monthly progress statusing.
- Process for identifying, reporting and analyzing schedule and cost variances.
- Facilitates inter-project and laboratory communication of cost & schedule performance.
- Provide Projects and Engineering Organizations with manpower forecasting capabilities.

Organization - WBS

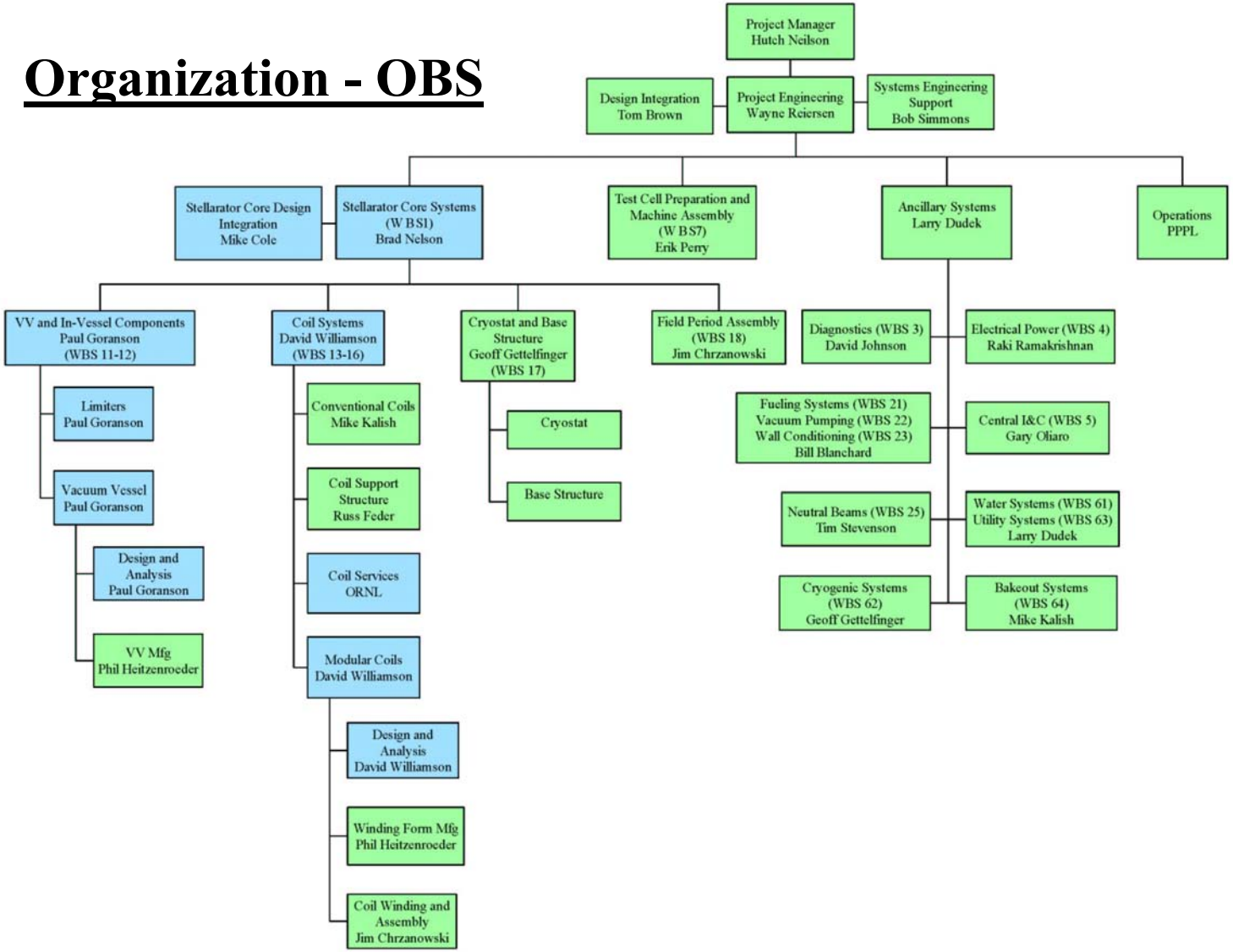
WORK BREAKDOWN STRUCTURE (WBS)

The WBS organizes the NCSX project work scope and provides the logical structure that will be used to control the project. The WBS is composed of the appropriate levels as required for work definition and control consistent with technical risk and difficulty. By convention, the first digit in the WBS is designated "level 2," the second digit "level 3," etc. The WBS matrix is provided in the following table below, with the Stellarator Core (WBS 1) expanded due to its importance. While WBS 1 has been expanded to the third digit, all the WBS elements are expanded and more completely defined in a series of separately issued and approved set of WBS dictionaries. The WBS Dictionary for each WBS element contains a brief description of the work scope for each element. This work scope includes design work necessary to assure that required future upgrades can be accommodated. (ref NCSX WBS Dictionary)

Organization – WBS *(continued)*

WBS		Description
1		Stellarator Core Systems
	11	In-Vessel Components
	12	Vacuum Vessel
	13	Conventional Coils
	14	Modular Coils *Example B*
	15	Structures
	16	Cryostat
	17	Coil Services
	18	Field Period Assembly
2		Plasma Heating, Fueling, and Vacuum Systems
3		Diagnostic Systems
4		Electrical Power Systems
5		Central I&C Systems
6		Facility Systems
7		NCSX Test Cell Preparation and Machine Assembly
8		Management and Integration

Organization - OBS



Roles and Responsibilities

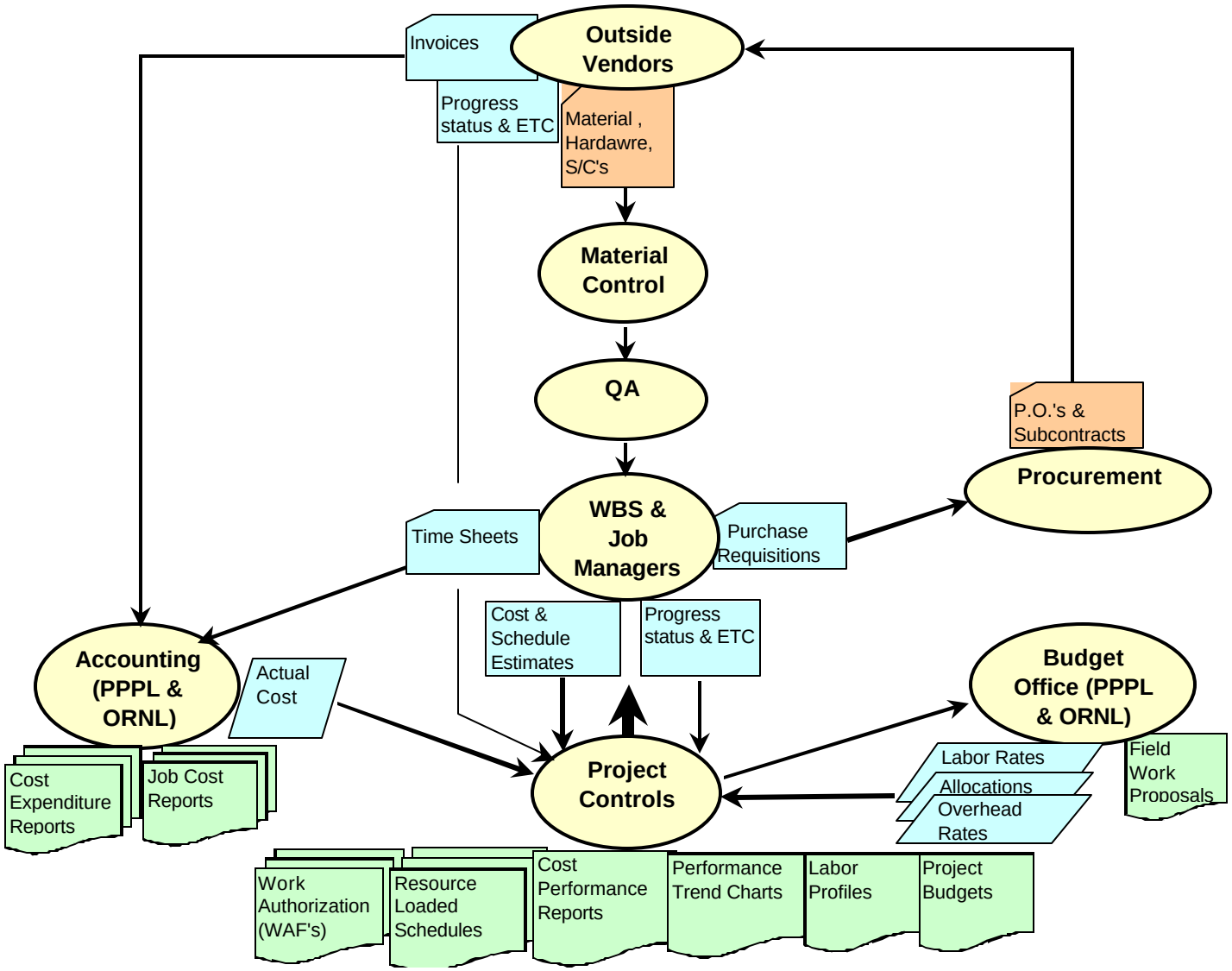
The responsibility for planning, estimating, and managing a job is assigned to a job manager. Job managers report to WBS managers who in-turn report to the Engineering Manager. Typical PCS Responsibilities are as follows;

- Project Manager
  - Ensures staff compliance and support of functional procedures. Responsible for accomplishing technical scope, meeting project milestones, and control of project cost within prescribed DOE Funding constraints
  - Technical, cost, schedule and budget accountability.
  - Approval of Work Authorization Documentation
  - Change Approval
  - Regular reporting to DOE Project Manager
- Project Engineering Manager
  - Establishes technical schedule priorities
  - Approval of Work Authorization Documentation
  - Responsible for Systems Integration
  - Change Approval
- WBS Managers
  - Technical, cost, schedule and budget accountability for the WBS element.

Roles and Responsibilities *(continued)*

- Job Mangers
  - Technical, cost, schedule and budget accountability for the applicable job element
  - Preparation of job cost & schedule estimates
  - Preparation of monthly job progress status and ETC.
  - Control of job costs up to the authorized estimate.
- Project Control Manager
  - Responsible for the implementation, coordination and operation of PCS
    - Generation of Work Authorization Documentation
    - Coordination & processing of progress status
    - Generation of cost & schedule performance
    - PCS Data base and support systems maintenance and control.
  - Provide scheduling and estimating support to Project and job managers.
  - Generate specialized schedules and reports.
  - Interface with PPPL Budget and Accounting
  - Interface with ORNL Budget and Accounting
- Accounting and Budget Offices
  - Maintenance & control of cost collection and accounting systems
  - Maintenance & control of Labor rates, overhead rates and other indirect costs
  - Maintenance & control of Laboratory Funding.

PCS INTEGRATION



Plans and Schedules

- **Developed, maintained and controlled by the Project Control Manager**
- **Primavera Project Planner Software Based**
- **Levels**
  - **Level I Project Milestone Summary Schedule** -Identifies significant project milestones and summary logic for the entire project.
  - **The Level II Intermediate Level Schedules** - Shows major milestones and key tasks by WBS including interrelationships for the entire project. Forms the basis for establishing project critical paths, current fiscal schedule priorities, and project cost estimate and field work proposal. Controlled document.
  - **The Level III Job Schedules** - Detailed schedules prepared by the Job Manager (a.k.a. Cost Account Manager). This schedule is established as part of the Work Authorization process and will span at least the current fiscal year. These schedules are resource loaded at the activity level and will form the basis for Budgeted Cost of Work Scheduled (BCWS). These schedules will also be progress statused by the cognizant job manager each month for calculation of Budgeted Cost of Work Performed (BCWP).

Example C

Example D

Example E

Plans and Schedules (continued)

- **The Level III Job Schedules (continued)** These Job Schedules will also be integrated with the Level II schedule to allow for critical path analysis. Major contributors to the project may have activities added to the schedule as appropriate. For example, QA/ES&H, Certifications & Training, Facility Engineering and Emergency Preparedness departments may have activities relevant to the project schedule although not directly covered in the project job estimates (cost for these activities are recovered through the indirect cost accounting process). In addition to PPPL work, **major subcontractors may have their schedules incorporated into the** project schedule. Integration of these Level III job schedules is facilitated by the use of Primavera Project Planner (P3), a commercially available, PC based project management software product. P3 is used as the primary project scheduling tool. Project milestones and job schedule detail activities are linked to form the nucleus of the project schedule. Controlled document.

Example F

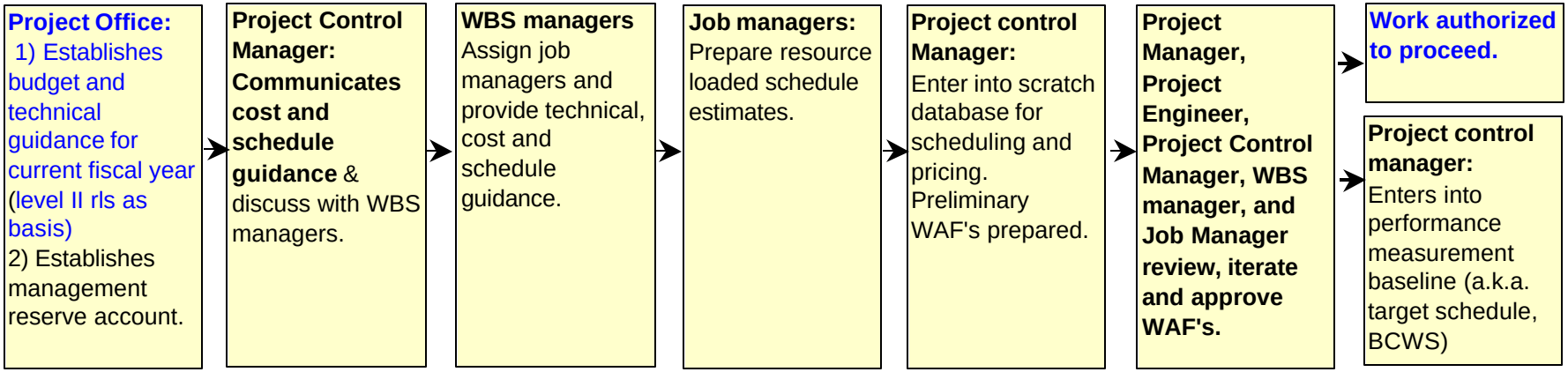
- **The Level IV Detail working level schedules** - Prepared as needed. As critical tasks occur (i.e., complex hardware fabrication, construction/ installation tasks) activities that are covered in the Level III job schedules may be broken down into additional detail to allow for coordination of work by the responsible manager. In addition, level IV schedules are also developed by cognizant job managers to aid in the performance and control of their jobs. These are uncontrolled documents.

Work Estimating and Authorization

- Formal process for integrating work scope, schedule, budget, responsibility, and authorization.
- Job manager responsible and accountable for accomplishing the scope of work, as defined, within established schedule and cost targets.
- The vehicle for documenting and authorizing work is the Work Authorization Form (WAF).
- Forms the performance measurement baseline.
- Baseline updated at least annually by beginning of next fiscal year.

Work Authorization Process

Example H



Example G

Cost and Schedule Baseline

- Performance measurement baseline

  The sum of all WAF budgets and planning packages. The current fiscal year will be planned, authorized and controlled by WAF's (Level III). Out year PMB will consist of planning packages which are higher level resource loaded schedule representing the project baseline (established at CD-2). The PMB is equal to the project MIE, R&D, & Research Prep* funded work less the contingency and management reserve.

- Contingency

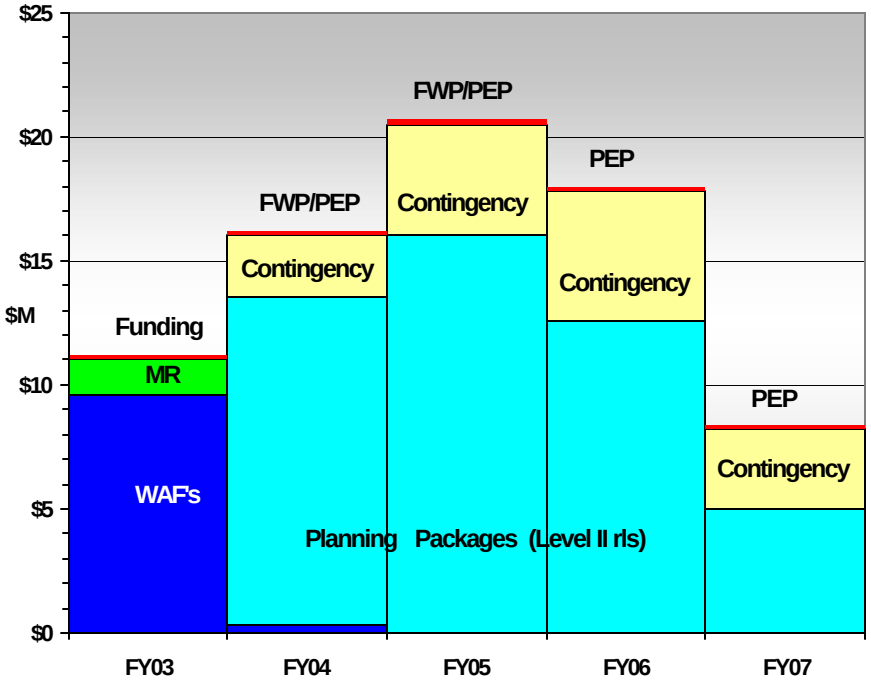
  Contingency is defined as funds budgeted for the entire project that will cover cost that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. Contingency is estimated by performing a technical, cost and schedule risk assessment of the project scope (~ 28%).Contingency is controlled and disbursed by baseline change control (ECP) process as defined in the PEP. The DOE Project manager controls and approves changes that require the use of contingency.

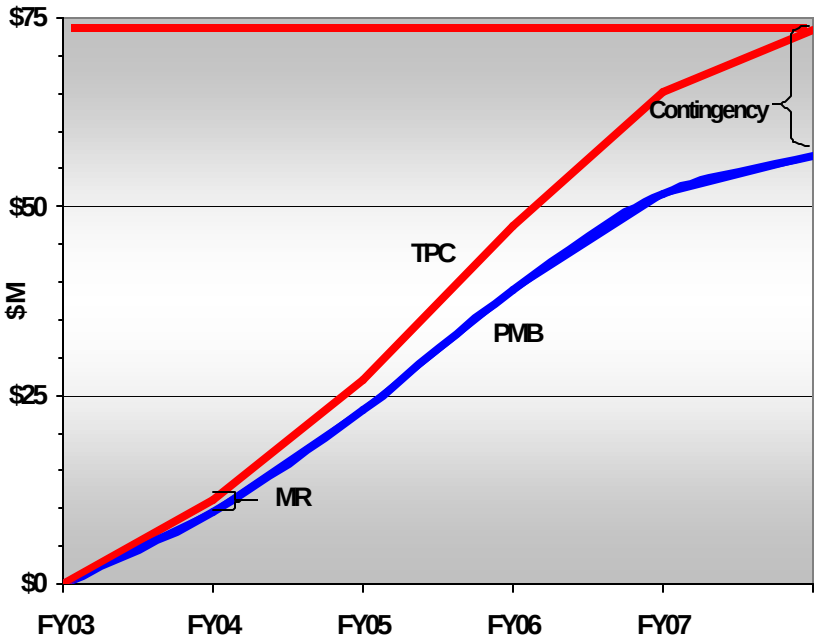
- Management Reserve

  Management reserve funds are a portion of each year's approved funding allowance that are set aside at the beginning of each fiscal year instead of being immediately used to authorize work. Management reserve funds will be held in a unique management reserve account controlled by the NCSX Project Manager. As needs arise, the Project Manager will authorize disbursement of the management reserve funds to authorize as yet un-funded work scheduled for the current year

  **** Defined in PPPL's Capital and Operating Expenditures for NCSX*** *Example I*

Cost and Schedule Baseline (continued)

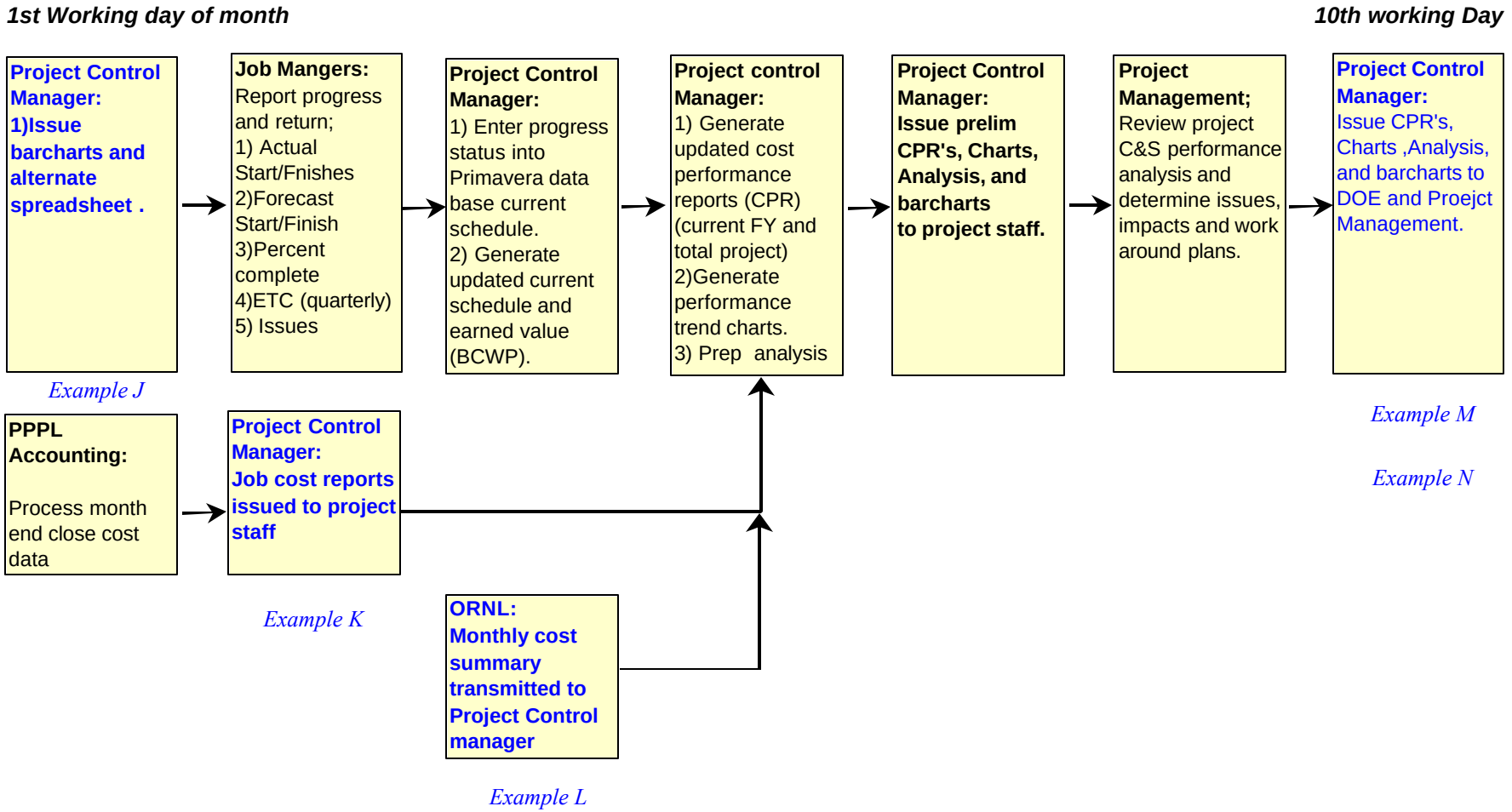




Progress Status

Monthly schedule progress is collected from the performing organization for each job and processed into the integrated PCS database. This will provide the basis for Budgeted Cost of Work Performed (BCWP) and updated project schedules.

Monthly Progress Status



Cost Accounting

- Funding will be provided by DOE directly to PPPL and ORNL separately via the Financial Plan and Contract Modification Process.
- Each institution budgets these funds, consistent with their DOE accepted budget and accounting practices.
- The NCSX Project PCS system is utilized for estimating Project budgets.
- Project budgets are quantified in direct labor (hours) and non-labor ($) quantities.
- All costs and budgets shown in the NCSX Project PCS system reports reflect both direct and indirect cost by applying appropriate overhead & burdens as described below;
    - **Direct costs** are those specifically designated toward program objectives. The NCSX project estimates these cost using the PCS system by identifying scope, tasks and resources.
        - Labor resources are estimated by department, division and skill in units of hours. (eg. Mechanical Engineering engineer, designer, Electrical engineering technician, engineer, etc.). Both budget and actual cost are calculated by applying **average salary rates** to the hours estimated in addition to applicable overhead & burden cost (see below).
        - Non-labor resources are estimated by expense category in units of dollars. (eg. Travel, M&S, Energy, stockroom, overtime etc.)

Example O

Cost Accounting (continued)

Example P

- **PPPL Indirect costs** Establishment and control of these costs is responsibility of the Indirect Cost Center Managers and the PPPL Budget Office.
  - *Direct Allocations (54xx)* - Cost of activities that directly support several final cost objectives are collected in separate cost centers and distributed to cost objectives through percentage distribution tables based on an assessment of the benefits received.
  - *Tech Center & Research Burden (53xx, 5215)* - Costs associated with the management and administration of the home divisions are collected in separate cost centers and allocated to final cost objectives as a percentage of the productive labor time of the subject division.
  - *Indirect Allocations (51xx)* - Costs of activities that indirectly support final cost objectives are collected in separate cost centers and distributed to cost objectives through percentage distribution tables **(allocation map)** based on an assessment of the benefits received.

Example Q

  - *G&A (6xxx)* - Costs of activities that benefit the institution at-large are collected in separate cost centers in a G&A cost pool and distributed
- **ORNL indirect cost**
  - *FED Organization Burden* - FED division administration cost, misc materials, and other internal services.
  - *G&A* - Costs of activities that benefit the institution at-large are collected in separate cost centers in a G&A cost pool and distributed

Reporting

Performance Indicators

- The NCSX PCS provides for the objective measurement and analysis of performance against the technical, cost, and schedule baselines.
- Budget and progress data is collected at the task level within job and cost data is collected at the job level.
- Performance indicators are computed each month on a cumulative to date basis and reported at the job level and summarized through the WBS and Organization.
- Variance analysis is performed at the job level when variance thresholds are exceeded.
- Performance Indicators
    - Budgeted cost of Work Scheduled (BCWS)
      BCWS represents the time-phased budget for work shown on a WAF, against which actual performance is measured. For any given point in time BCWS to date is determined at the job level by totaling the budgets for the activities scheduled to be in progress.
    - Budgeted Cost of Work Performed (BCWP)
      BCWP, also called "earned value", represents the amount of budget (BCWS) assigned to an activity within a WAF that has been partially or fully "earned" as a result of work having been completed. PPPL utilizes three methods of assessing BCWP;

Reporting

Performance Indicators - *continued*

Percent Complete (primary method)

In this method each activity's schedule progress is assessed by the job manager, each month, by estimating a percent completion for each task. Additionally, the job manager assigns actual/forecast start and finish dates for tasks where applicable.

Level-of-Effort

This method is usually reserved for activities that have no deliverables or products such management and supervision. In this case BCWP will always equal BCWS.

50/50

This method is employed for selected material purchases. 50% of the budgeted cost is earned when a purchase order is placed with the balance earned upon delivery.

- Actual Cost of Work Performed (ACWP)

  ACWP represents the amount of actual charges to the job. This data is collected at the job account level. ACWP is not collected nor reported by activity.
- Budget at Completion (BAC)

  BAC is the total baseline budget for completing assigned scopes of work. At the WAF level, it is the sum of all current year BCWS. At the project level it is the sum of all past year budgets the current year WAF budgets and future planned work.

Reporting

Performance Indicators - *continued*

- Estimate at Completion (EAC)
  EAC is the estimated costs at completion of the assigned work scope. The job manager inputs an EAC when statusing the WAF if he/she determines the BAC will be exceeded or underrun.
- Schedule Variance (SV)
  The Schedule Variance is the difference between the BCWP minus the BCWS. This provides an overall assessment of schedule progress but does not indicate specific schedule impacts or criticalities. A critical path schedule analysis will also be prepared to determine impacts to the project schedule.
- Cost Variance (CV)
  The Cost Variance is the difference between the BCWP minus the ACWP. This comparison provides an early indicator of potential cost over/under runs and can be used to validate the independently obtained EAC.
- Cost Performance Index (CPI)
  The CPI is equal to the BCWP divided by the ACWP. It provides a measure of "cost efficiency"; how much work is being accomplished per dollar spent.
- Schedule Performance Index (SPI)
  The SPI is equal to the BCWP divided by the BCWS. It provides a general indicator of how work is proceeding
  .

Reporting

Reports

The following reports will be generated and posted on the NCSX web site. Distribution will also be made the project management office and WBS/job managers. Reports generated include;

- **Summary performance charts** *Example M.5*
  Shows graphical trend performance.
- **PCS Cost Performance Reports (CPR's)** *Example M.2*
  These reports contain cost performance data from Project summary down to the job level. The reports will also segregate PPPL and ORNL performance. Reports will be generated for the current fiscal year as well as total project
- **Cost performance analysis** *Example M.6*
- **Schedule barcharts** *Example M.7*
  Shows detailed schedule –compares current progress status/forecast against baseline dates.
- **Critical Path Schedules** *Example T*
  Displays task linkages and total float for analysis of critical paths
- **Job Cost Reports** (PPPL only) *Example K*
  Shows detailed cost expenditures by expense classification, actual labor cost by individual, and purchase status by requisition/purchase order.
- **Accounting reports (available via PPPL's PUBSYS)** *Example R*
  Summary budget/cost status including commitments and requisitions
- **Detailed labor/task plans** *Example S*

Analysis and Control

Variance Analysis and management oversight

- Variance Analysis Reporting
  The purpose of variance analysis is to identify problems early so that prompt corrective action can be taken to minimize cost and schedule impacts, project cost overruns, and schedule delays etc. A variance analysis will be performed each month for jobs whose CPI or SPI is less than 0.90. Additionally, a separate critical path analysis will be performed to identify tasks whose current status/forecast may impact the project critical paths. The format of this analysis will include a written assessment prepared by the project control manager and distributed to the project team. This report will then be reviewed with the Project Manager, Engineering Manager, WBS 1 managers and Project Control Manager. This review will address the cause of the variance, the impact to the current schedule and cost baseline, and follow-up corrective action.

Analysis and Control

Variance Analysis and management oversight

- Management Oversight
  Formal communication of Project status and problems are addressed at the various meetings held by the NCSX project office, PPPL management and DOE. These are the forums for discussing specific technical, cost and schedule issues including problems requiring management attention and/or decision. Example of these meetings & reports include but are not limited to;
    - Weekly NCSX Systems Integration Team meetings
    - Weekly Engineering Meeting
    - Monthly NCSX Integrated Project Team meeting management reviews
    - Monthly NCSX PCS analysis review
    - Monthly NCSX Project team meeting
    - Quarterly DOE-PG and OFES review
    - Quarterly PPPL Laboratory Management Reviews (LMR's) (all PPPL Departments and projects present monthly status/issues)
    - DOE Semi-annual Technical, Cost, & Schedule Reviews

Analysis and Control

Change Control

- The NCSX change control process ensures that changes to the NCSX design and requirements are properly identified, screened, evaluated, implemented, and documented. The change control process is outlined in the Project Execution Plan (PEP) and described in detail in the Configuration Management Plan (CMP).
- The Engineering Change Proposal (ECP) will be the vehicle for controlling and documenting these changes. ECP will be initiated by specific changes resulting from normal project design evolution or by annual re-baselining exercises.
- Once an ECP has been prepared and the impacts fully documented, the ECP will come before a project Change Control Board (CCB) that is comprised of senior members of the NCSX management team. The NCSX Project Manager or his designee will chair the CCB. Upon approval the ECP will be submitted to the DOE Project Manager.
- Once a proposed change is approved by the DOE Project Manager the project will implement the change in a timely manner. Impacted WAF's will be generated and authorized to reflect cost and schedule changes. The official PMB will be updated and be the basis for future cost performance measurement.

PCS Review Summary

1. **Does PPPL's proposed Project Control System meet current DOE Earned Value Management System assessment and reporting requirements?**
   PPPL's PCS system provides a sound methodology for managing the NCSX project. It is consistent with the fundamentals in EIA standard EIA-748-AA "Earned Value Management Systems" specifically, it addresses program organization, scheduling, budget and resource allocation, accounting, earned value techniques, performance measurement, reporting, and data maintenance. PPPL's PCS has been successfully used on numerous like-size projects in recent years.

PCS Review Summary *(continued)*

a. Are the planned reporting format and frequency adequate considering project size, complexity, and risk?

The use of both cost performance reports (CPR's), utilizing earned value techniques, along with critical path schedules provide separate vehicles for reporting schedule performance and will serve to flag potential schedule impacts. Additionally, the CPR reporting formats serve as early indicators of potential cost and schedule overruns by utilizing both the comparison of earned value with actual cost as well as comparison of baseline budgets with estimates-at-completion. The project schedule covers all interdependent scope elements including, MIE construction, Operating funded R&D, as well as other independently funded work that could impact the timely completion of the project.

PCS Review Summary *(continued)*

b. Does the system produce timely and accurate reports in a readable and meaningful format?

The project issues cost performance reports, schedule barcharts, and accounting cost reports on a monthly basis. Reports are distributed to project participants electronically in a multi-platform format (PDF files) and will be posted on the project web site. Actual cost contained in the CPR's are derived from DOE accredited accounting systems. In addition to the cost and schedule reports a summary analysis is issued highlighting cost and schedule variances. Reports are normally issued by the 10th working day of each month.

PCS Review Summary *(continued)*

c. Is the system flexible enough to adapt to changes without extensive modifications?

The heart of PPPL's PCS system is based in PC based Primavera and Microsoft Excel. Modification of both the cost and schedule data as well as Excel based reports are straight forward. The current system has been successfully adapted and customized on prior PPPL projects. System mechanics and reports are managed by the Project Control Manager consistent with established change control procedures.

PCS Review Summary *(continued)*

2. Is the Project Control System management structure adequate and appropriate for guiding the proposed project through to completion, considering the joint responsibilities of PPPL & ORNL? Are the PPPL and ORNL roles and responsibilities for PCS reporting clearly documented and understood?

*The NCSX project is led by the Princeton Plasma Physics Laboratory (PPPL) with the Oak Ridge National Laboratory (ORNL) providing major technical leadership and support as a partner. The partners have formed an integrated team to carry out the NCSX project, where engineers and scientists from PPPL and ORNL work together to bring the necessary expertise to the project. This means that PPPL engineers and scientists will support areas in which ORNL has the lead and similarly, ORNL engineers and scientists will support areas in which PPPL has the lead. Management responsibilities are clearly assigned to one partner or the other, and PPPL has overall responsibility for the project. Responsibilities of the participants are also contained in the Project Execution Plan Rev 0 (PEP **)**. Work scope responsibilities have been established by integrating the WBS/OBS. The NCSX Project Control Manager is responsible for implementation and operation of the PCS. WBS and job managers are responsible for the management and execution of the technical, cost and schedule aspects of their defined scope. Both PPPL & ORNL WBS & Job managers clearly understand their responsibilities for timely & accurate PCS status reporting.*

Glossary of Terms

ACWP	Actual Cost of Work Performed
BAC	Budget at Completion
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
CPI	Cost Performance Index
CV	Cost Variance
EAC	Estimate at Completion
ETC	Estimate to Complete
FED	Fusion Engineering Division (ORNL)
HOD	Home Organizational Demographic
LOE	Level of Effort
OBS	Organizational Breakdown Structure
ORNL	Oak Ridge National Laboratory
PG	Princeton Group (DOE)
PMB	Performance Measurement Baseline
PCS	Project Control System
PPPL	Princeton Plasma Physics Laboratory
SPI	Schedule Performance Index
SV	Schedule Variance
WAF	Work Authorization Form
WBS	Work Breakdown Structure

Examples
and
Sample Reports

PRINCETON PLASMA PHYSICS LABORATORY
PROJECT CONTROL SYSTEM DESCRIPTION

PPPL PROJECTS

Revision: 0

JULY 1996

Prepared: _____
R.L.Strykowsky
Head Cost & Schedule Control Office

Reviewed: _____ 22 July 1996
E.Winkler
Head Office of Resource Management

Reviewed: _____ 7/26/96
R.Hawryluk
Head Tokamak Confinement Systems Department

Reviewed: _____
J.Schmidt
Head Advanced Projects Department

_____ 9/26/96
G.Pitonak
DOE Project Manager
Princeton Group

Example "A"

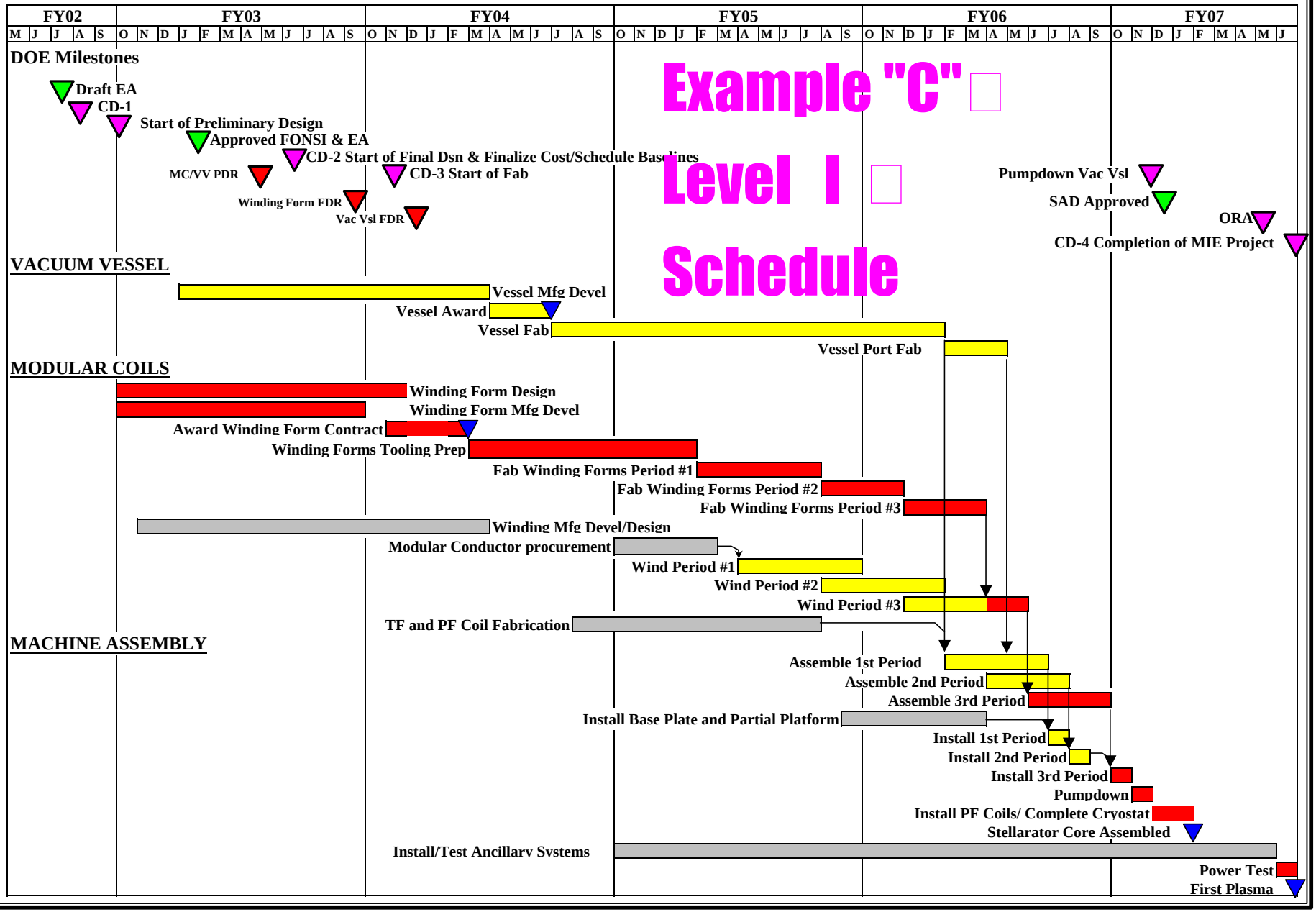
PPPL's PCS System Description "blueprint" (ref on file)

Work Breakdown Structure (WBS) Dictionary
Stellarator Core Systems (WBS 1)

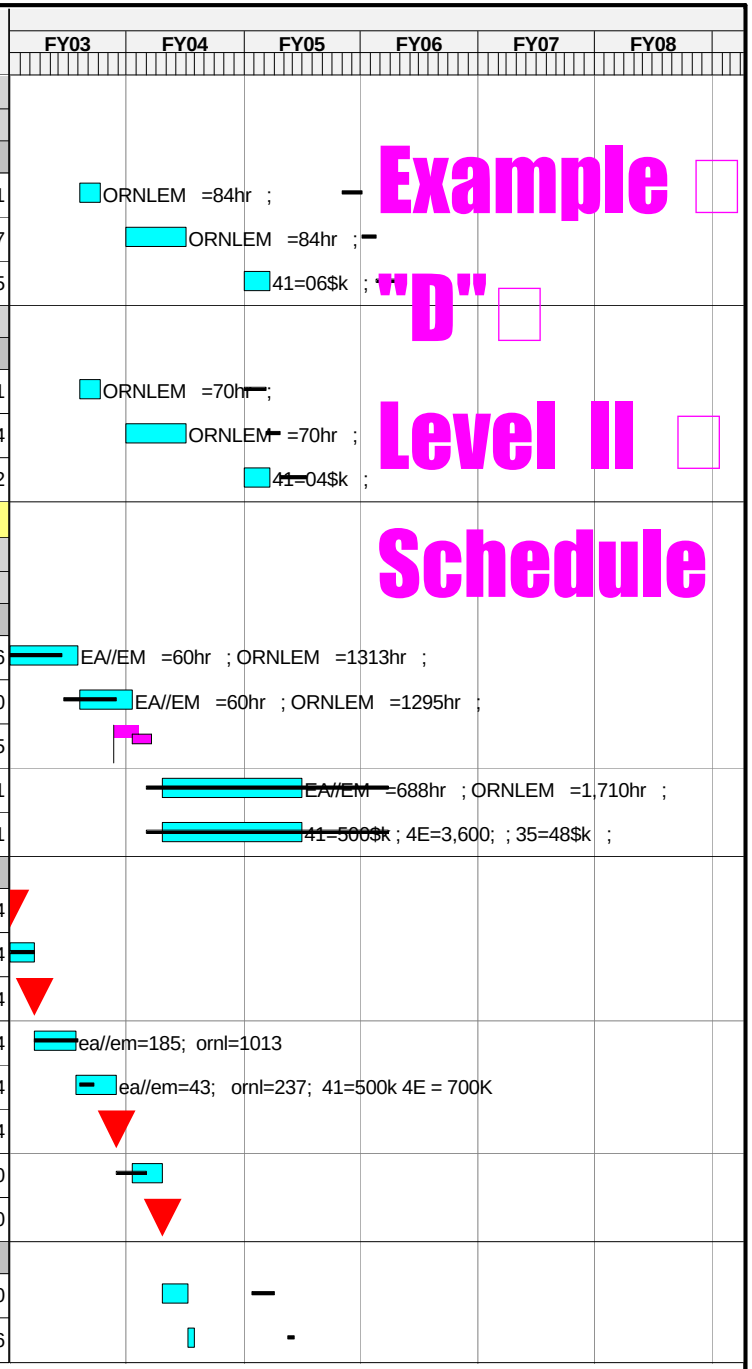
WBS Element: 133	WBS Level: 4
WBS Title:	**External Trim Coils**
Description:	The external trim coils are intended to provide field error correction. These will be conventionally wound coils mounted to the coil configuration. They are provided at the top, bottom, and sides and supported on the Coil Support Structure (WBS 151) primarily to reduce low poloidal mode number (m) resonant errors that may result from manufacturing or assembly errors in the modular coil geometry. This WBS element consists of the manufacturing design and fabrication of the External Trim Coils. The coils are supported by the Coil Support Structure (WBS 151).
WBS Element: 134	**WBS Level: 4**
WBS Title:	**Conventional Coil Local I&C**
Description:	This WBS element provides the manufacturing design and fabrication of the local I&C components required by the WBS elements under Conventional Coils (WBS 13). Local I&C requirements will be designed into the associated WBS elements, and may include strain gages, RTDs, and voltage taps.

WBS Element: 14	WBS Level: 3
WBS Title:	**Modular Coils**
Description:	This WBS element consists of all the following: • Winding Form (WBS 141) • Winding and Assembly (WBS 142) • Modular Coils Local I&C (WBS 173). This WBS element consists of the design and fabrication of the modular coil components, including supporting R&D necessary for the design and fabrication of these components. Modular coil assembly and installation in a field period is covered in Field Period Assembly (WBS 18). Final assembly of the field periods is covered under Test Cell Preparation and Machine Assembly (WBS 7). Integrated systems testing is also covered under Test Cell Preparation and Machine Assembly (WBS 7).
WBS Element: 141	**WBS Level: 4**
WBS Title:	**Modular Coil Winding Form**
Description:	This WBS element consists of the design and fabrication of the modular coil winding form. There are three different coil types and three different winding forms that are repeated for a total of 18 winding forms. Each winding form is fabricated as a casting. Due to the complexity of the shape, the pattern geometry is assumed to require at least two iterations by a pattern maker. After stress relieving the castings in a fixture, all structural interface features are machined. After the coils are wound, the winding forms are bolted together, to form a complete field period. During final assembly, the field periods are bolted together to form the completed stellarator core assembly.
WBS Element: 142	**WBS Level: 4**
WBS Title:	**Modular Coils Windings and Assembly**
Description:	This WBS element consists of the design and fabrication of the modular coil windings and coil assembly. The modular coil set consists of three field periods with 6 coils per period, for a total of 18 coils. Due to symmetry, only three different coil shapes are needed to make up the complete coil set. Within the modular coil envelope, a thick web supports two multi-turn winding packs. The design concept uses flexible, copper cable conductor that has been compacted into a rectangular cross-section and wrapped with Kapton and glass tape insulation. The conductor is wound in a double pancake on each side of the structural web. Chill plates consisting of copper sheet with cooling tubes (or a different arrangement to be determined during design) are provided for coil cooling. After winding is complete, the final geometry is verified and the assembly is vacuum pressure impregnated with epoxy to complete the insulation system. The epoxy fills the voids within the cable conductor so the winding pack becomes a

NCSX Critical Path Summary Schedule

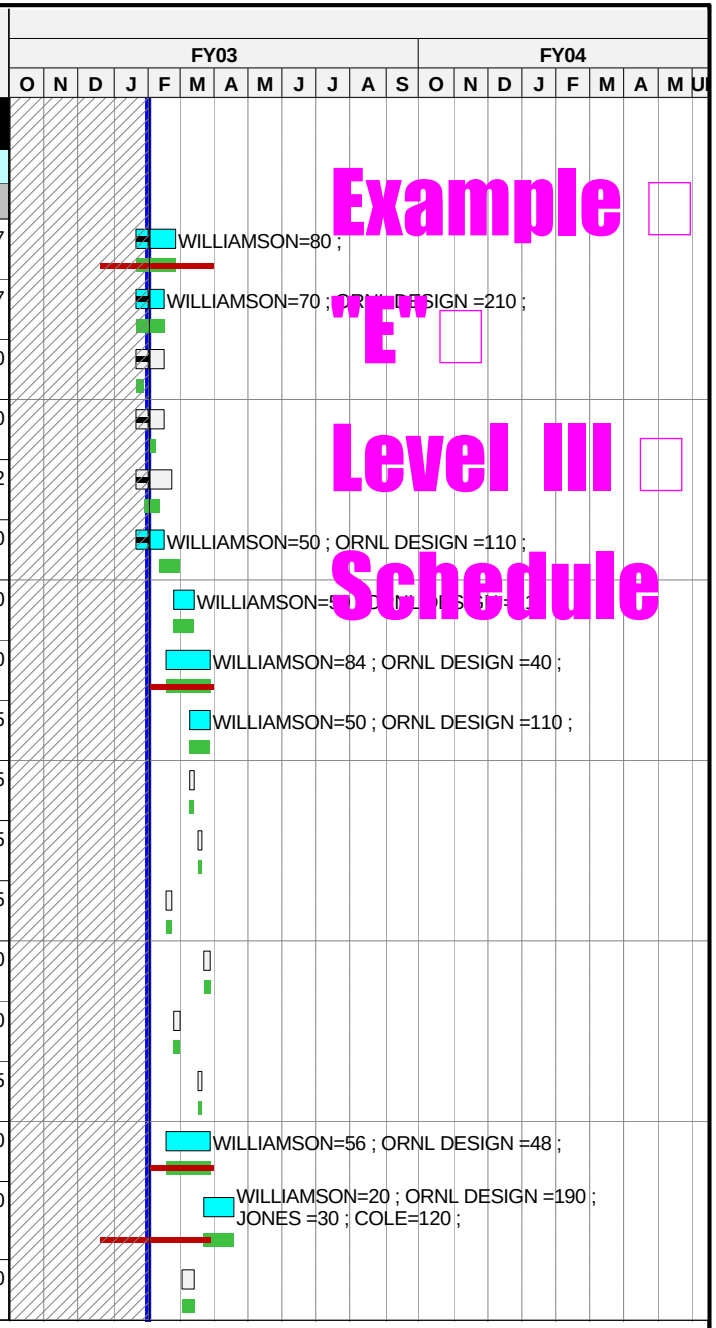


Activity ID	Activity Description	Early Start	Early Finish	BA	Budgeted Cost	Total Float
134 - Conventional Coil Local I&C						
1341 - TF Coil Local I&C						
133-001	Title I design WBS 1341 TF I&C	05MAY03	09JUL03		9,436.77	461
133-011	Title II design WBS 1341 TF I&C	01OCT03*	30MAR04		10,351.35	627
133-037	TF I&C Procurement	01OCT04*	23DEC04		6,854.19	495
1342 - PF Coil Local I&C						
147-001	Title I design WBS 1342 pf I&C	05MAY03	09JUL03		7,944.49	461
147-011	Title II design WBS 1342 pf I&C	01OCT03*	30MAR04		8,714.45	714
147-037	PF Local I&C Procurement	01OCT04*	23DEC04		4,569.46	582
14 - Modular Coils						
141 - Modular Coil Winding Form						
.						
172-001	Title I design WBS 141 Mod coil winding form	01OCT02*	02MAY03		157,391.44	146
172-011	Title II design WBS 141 Mod coil winding form	05MAY03	16OCT03		156,824.42	360
172-012	WBS 14 Modular Coil FDR		16OCT03		0.00	805
172-031	Title III engr	16JAN04	31MAR05		327,841.80	381
172-037	Procurement vendor cost (A/A 1/C)	16JAN04	31MAR05	B	4,436,223.25	381
Castings						
C-00	Issue RFP for 2 R&D Vendors	24SEP02*			0.00	394
C-000	Castings-RFP for Vendor R&D	24SEP02	13DEC02		0.00	394
C-001	Castings-Contract for Vendor R&D Placed	16DEC02			0.00	394
C-021	Castings-R&D casting tooling preparation type BA	16DEC02	25APR03		142,652.44	394
C-041	Fab 1 Both Vendors Deliver Casting (E/A F/B)	28APR03	29AUG03	B	1,343,396.56	394
C-061	Castings-R&D Casting Received at PPPL		29AUG03		0.00	394
C-071	Evaluate R&D casing and cost proposal	17OCT03	15JAN04		0.00	360
C-081	Castings-Contract for Mfg. Placed with 1 vendor	16JAN04			0.00	360
Type 1						
C-121	Castings-BA-1-1	16JAN04	08APR04		0.00	360
C-181	Castings-BA-4-1	09APR04	29APR04		0.00	366



Example "D" Level II Schedule

Activity ID	Activity Description	Current Start	Current Finish	% Cmplt	Earned value (BCWP)	Baseline Budget	Total Float
Cost Center: 1850 - NCSX Advanced Concep Design							
Work Package: 1*-Stellarator core**							
Job: 1401 - Mod Coil Dsn -WILLIAMSON							
140-1-1	Design-to specification (SRD)	22JAN03A	26FEB03	10	1,152.00	11,520.00	47
140-5-11	Develop detailed ProE models of winding forms	22JAN03A	14FEB03	30	9,954.00	33,180.00	2,507
L4-093	Incorporate features to resolve issue of multipl	22JAN03A	14FEB03	30	0.00	0.00	40
L4-094	Incorporate final port geometry into shell cutou	22JAN03A	14FEB03	30	0.00	0.00	40
L4-098	Develop design of wings, including structural at	22JAN03A	21FEB03	30	0.00	0.00	2,502
140-5-12	Develop detailed ProE models winding packs&leads	22JAN03A	14FEB03	30	8,569.20	19,300.00	20
L4-097	Develop detailed ProE models clamps&cooling sys	24FEB03*	14MAR03		0.00	19,300.00	10
140-2-1	Develop ICD for conv coils.vessel,structure	17FEB03*	28MAR03		0.00	16,496.00	30
L4-091.1	Develop assy models,incl bolts,insul,	10MAR03*	28MAR03		0.00	19,300.00	15
L4-092	Develop design of insulating, bolted joints at f	10MAR03*	14MAR03		0.00	0.00	15
L4-095	Incorporate feature to support the VV	17MAR03*	21MAR03		0.00	0.00	15
L4-105	Develop ICD with conventional coils (WBS 12)	17FEB03*	21FEB03		0.00	0.00	55
L4-096	Incorporate features required for FP and final a	24MAR03*	28MAR03		0.00	0.00	30
L4-106	Develop ICD with coil structures (WBS 13)	24FEB03*	28FEB03		0.00	0.00	50
L4-107	Develop ICD with diagnostics (WBS 15)	17MAR03*	21MAR03		0.00	0.00	35
140-2-3	Develop ICD with cryo,power, I&C	17FEB03*	28MAR03		0.00	13,344.00	30
140-5-2	Prepare Preliminary Design Drawings	24MAR03*	18APR03		0.00	43,610.00	20
L4-108	Develop ICD with WBS 4, including grounding and	03MAR03*	14MAR03		0.00	0.00	40



3.12 PPPL RECEIVING AND INSPECTION

PPPL will perform Receiving Inspection on items or services supplied by Subcontractor, using either a sampling plan or 100% inspection. Discrepant items or services will be rejected and returned to Subcontractor or reworked by PPPL at the Subcontractor's expense.

Example "F"

Excerpt from SOW

requiring earned value

reporting

4 DELIVERABLES

4.1 WEEKLY REPORTS

Weekly status reports covering technical, administrative, and Quality activities shall be provided to Princeton's Technical and Administrative Representatives by e-mail every Friday during the period of performance.

4.2 EARNED VALUE REPORTING

The Contractor shall prepare and submit monthly e-mail reports indicating earned value achieved. This will be a simplified earned value reporting requirement that will require the following actions by the contractor in preparation for earned value reporting:

- The Contractor will submit a resource-loaded (fully loaded dollars only) schedule that clearly indicates the tasks to be accomplished, the time frame over which each task will be accomplished, and the resources assigned to that task. This schedule will be submitted within three (3) weeks of contract award.
- The Contractor will monthly (e-mail report satisfactory) report costs (accrued and actual) against each task on the resource-loaded schedule. The first report shall be submitted at the end of the first calendar month of the contract award (i.e., if contract awarded in January 2003, the first report will be provided at the end of January 2003).
- The Contractor shall monthly report percent complete on each task (e-mail report satisfactory). PPPL will then use this percent complete to determine the earned value based on the total resources applied to each task.
- On an exception basis, PPPL will request explanation and proposed corrective action plan on those tasks that develop significant unfavorable schedule or cost variances.

4.3 TECHNICAL REPORTS

Provide (3) printed copies and (1) electronic copy in Adobe Acrobat .pdf format of all technical reports by the dates specified in the Subcontract.

Ron Strykowsky

From: Ron Strykowsky [rstrykowsky@pppl.gov]
Sent: Thursday, August 01, 2002 11:52 AM
To: nelsonbe@ornl.gov; ldudek@pppl.gov; eperry@pppl.gov; mzarnstorff@pppl.gov; wreiersen@pppl.gov; djohnson@pppl.gov; sramakrishnan@pppl.gov; hkugel@pppl.gov; goliaro@pppl.gov
Cc: hneilson@pppl.gov; mwilliams@pppl.gov; bsimmons@pppl.gov; jchrzano@pppl.gov; pheitzen@pppl.gov
Subject: FY03 Planning Exercise

FY03 Planning Instructions2.pd...

Folks,
Please find attached instructions which you should follow in preparing your detailed bottoms-up estimates for FY03.

Please familiarize yourself with the budget and schedule guidance including the instructions. Pamela will be setting up individual work package level meetings over the next two weeks with you, Hutch, Wayne, Mike Williams and myself as a forum to address your questions/issues and for the Project Office to delineate their expectations. The outcome of this meeting should provide a clear path forward for you to scope-out, organize and them prepare your bottoms-up estimate for FY03. Until this meeting, if you have any questions please let me know. Thanks, Ron
609-243-2674

Example "G.1"

Work Authorization "kick-off" memo

Example "G.2"

Planning Guidelines

FY03 NCSX Job Planning

Attachments

- **A) Budget Guidance**
- **B) Schedule Guidance**
- **C) sample format**
- **D) resource codes**

Instructions

1) Establish job package groupings and identify job managers (see **attachment D** for job numbering scheme)
2) Identify deliverable oriented tasks
3) Prepare a resource loaded schedule in a logic diagram format (not a punch list of "to-do" tasks. **See attachment C** as a format). This logic diagram can be either hand drawn, Excel based, Fast track, Microsoft project etc.)
4) Task durations 1-2 months except Level-Of-Effort (LOE) (ie. Supervision, support, misc materials/supplies etc.)
5) Identify major links, prerequisites, interfaces with other WBS schedules.
6) Estimate manpower in manhours. Use the established manpower resource codes on **attachment D.**
7) Identify engineers, researchers, designers etc by name (for internal manpower planning)
8) Estimate non labor costs such as travel, materials and supplies, subcontract cost (PPPL estimates should not include overhead. ORNL should include include overhead)
9) On a separate sheet list assumptions, basis of estimate and deliverables.
10) ALL WORK IN FY03 MUST BE PLANNED

Estimates to be submitted to Ron Strykowsky NLT Friday August 23rd

Example "G.3"

ATTACHMENT A

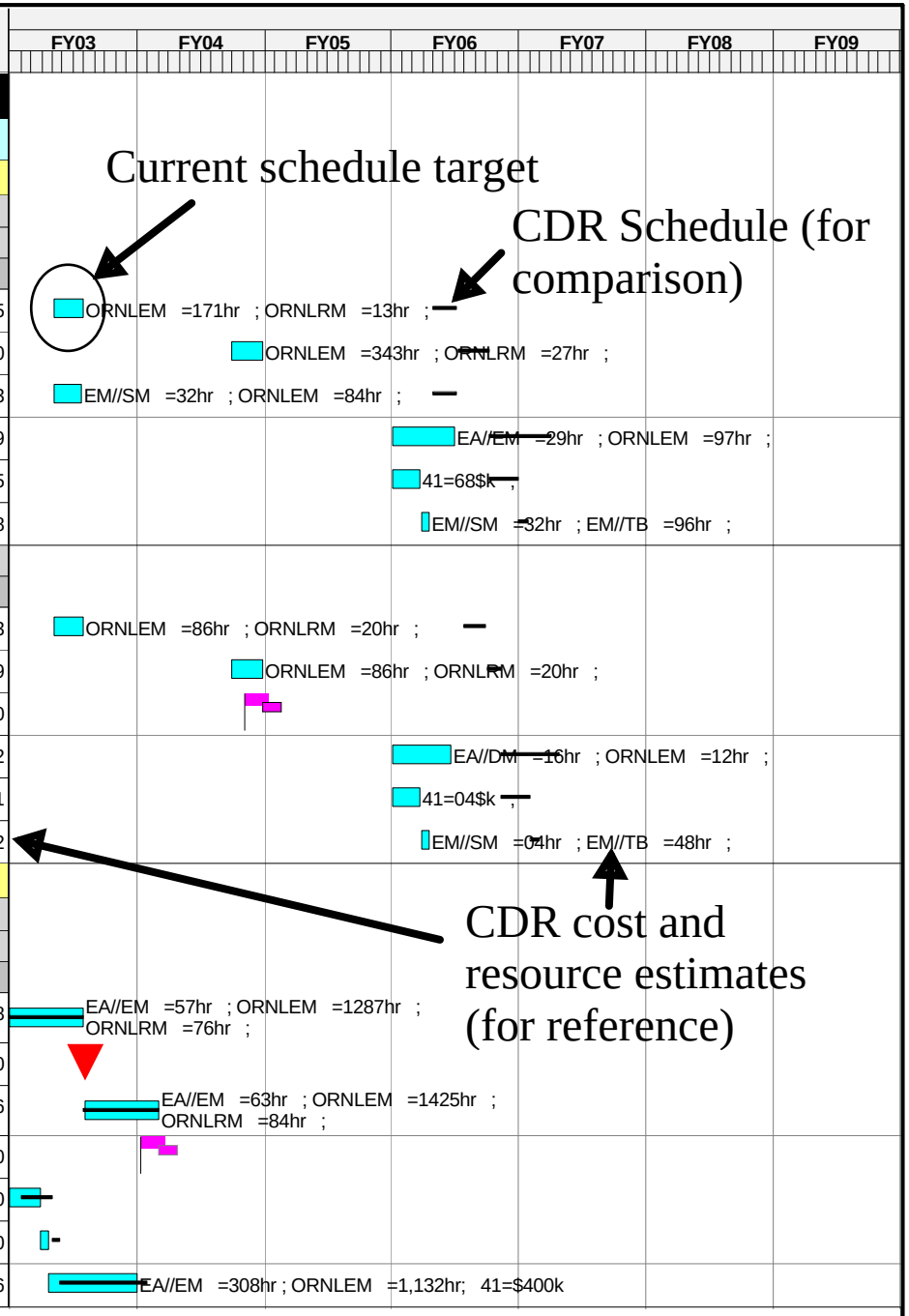
NCSX FY03 Budget Guidance ($K)

Cost Guidance

MIE (cc 9450)	WBS 1 level manager	WBS 2/Job manager	FY03 Target $ (loaded)	Note
11 - In-Vessel Components	Brad Nelson	Paul Goranson	**$47**	
12 - Vacuum Vessel Systems	Brad Nelson	Paul Goranson	**$1,009**	incl $400k M&S contract for VV R&D
13 - Conventional Coils	Brad Nelson	David Williamson	**$326**	
14 - Modular Coils	Brad Nelson	David Williamson	**$5,037**	incl $1.2m M&S contract for casting R&D ($600k each vendor) incl $393k R&D M&S
15 - Structures	Brad Nelson	David Williamson	**$196**	
16 - Coil Services	Brad Nelson	David Williamson		
17 - Cryostat and Base Support Structure	Brad Nelson	Tom Brown	**$0**	
18 - Field Period Assembly	Brad Nelson	Jim Chrzanowski	**$48**	
19 - Stellarator Core Management and Integratic	Brad Nelson	Brad Nelson	*included in above. To be broken out by ORNL.*	
21 - Fueling Systems	Henry Kugel	Bill Blanchard	**$2**	
22 - Torus Vacuum Pumping Systems	Henry Kugel	Bill Blanchard	**$6**	
23 - Wall Conditioning Systems	Henry Kugel	Bill Blanchard	**$5**	
25 - Neutral Beam Injection System	Henry Kugel	Tim Stevenson	**$211**	
31 - Magnetic Diagnostics	Dave Johnson		**$13**	
35 - Profile Diagnostics	Dave Johnson			
36 - Edge and Divertor Diagnostics	Dave Johnson			
38 - Electron Beam (EB) Mapping	Dave Johnson			
39 - Diagnostics Integration	Dave Johnson		**$59**	
41 - AC Power	Raki Ramakrishnan		**$37**	
42 - AC/DC Converters	Raki Ramakrishnan			
43 - DC Systems	Raki Ramakrishnan		**$118**	
44 - Control and protection Systems	Raki Ramakrishnan		**$83**	
45 - Power System Design and Integration	Raki Ramakrishnan		**$100**	
46 - FCPC Building Modifications	Raki Ramakrishnan			
51 - TCP/IP Infrastructure Systems	Gary Oliaro		**$3**	
52 - Central Instrumentation & Control	Gary Oliaro		**$3**	
53 - Data Acquisition & Facility Computing	Gary Oliaro		**$3**	
54 - Facility Timing & Synchronization	Gary Oliaro		**$3**	
55 - Real Time Plasma & Power Supply Control	Gary Oliaro		**$3**	
56 - Central Safety Interlock Systems	Gary Oliaro		**$3**	
57 - Control Room Facility	Gary Oliaro		**$3**	
61 - Water Systems	Larry Dudek			
62 - Cryogenic Systems	Larry Dudek			
63 - Utility Systems	Larry Dudek			
64 - Bakeout System	Larry Dudek			
65 - Facility Systems Integration	Larry Dudek		**$53**	
71 - Shield Wall Seismic Modifications	Erik Perry		**$476**	
72 - Control Room Refurbishment	Erik Perry			
73 - Platform Design & Fabrication	Erik Perry			
74 - Machine Assembly Planning and Oversight	Erik Perry		**$39**	
75 - Test Cell and Basement Assembly Operatio	Erik Perry			
76 - Integrated Systems Testing	Erik Perry			
77 - Tooling Design and Fabrication	Erik Perry			
81 - Project Management and Control	Hutch Neilson	Ron Strykowsky	**$768**	
82 - Project Engineering	Hutch Neilson	Wayne Reiersen	**$502**	
84 - Project Physics	Hutch Neilson	Mike Zarnstorff	**$304**	
PPPL ALLOCATIONS			**$171**	
CONTINGENCY			**$1,368**	
Grand Total			**$11,000**	

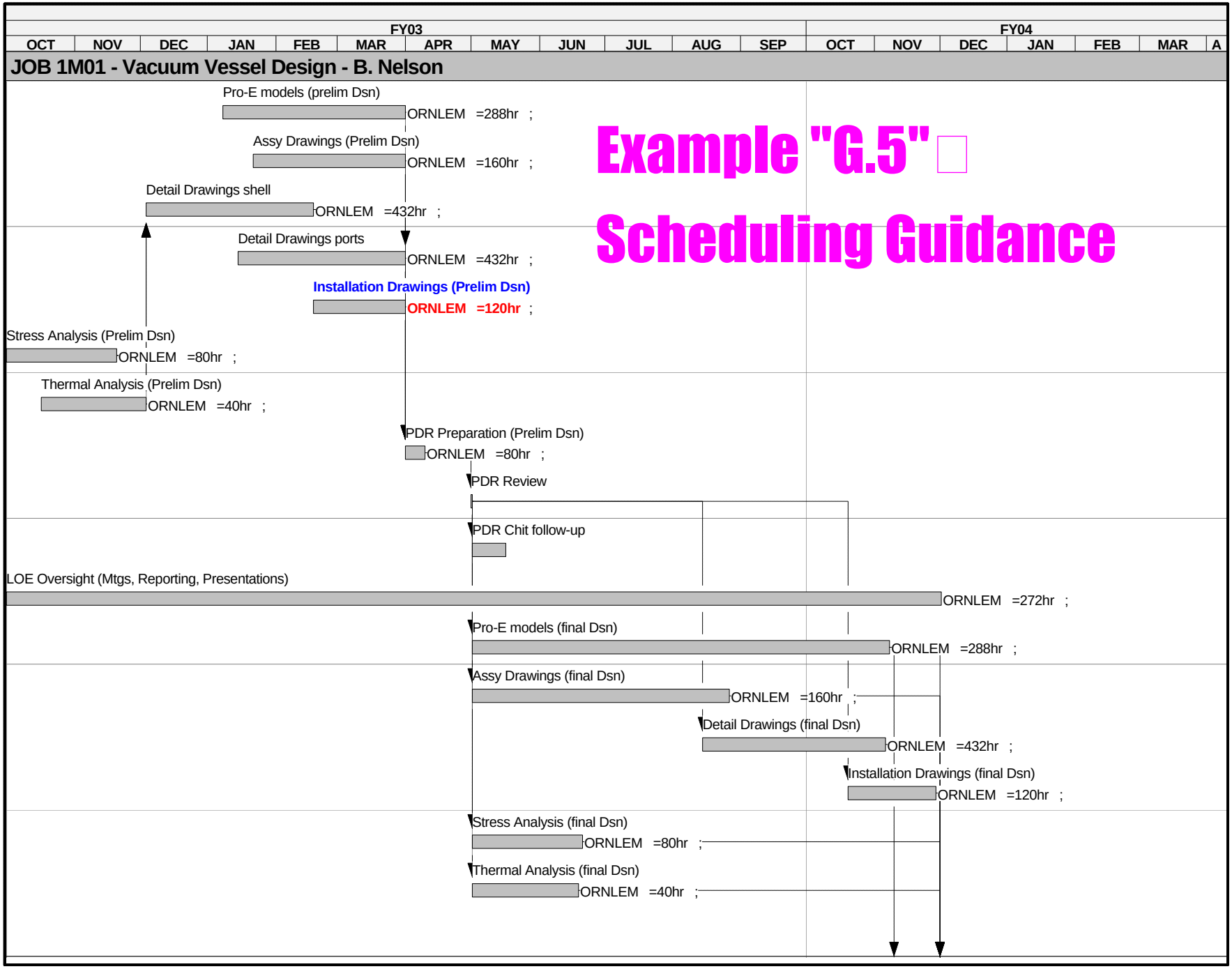
Example "G.4" Schedule Guidance

Activity ID	Activity Description	Early Start	Early Finish	Budgeted Cost
cc 9450 - NCSX Fabrication				
1 - Stellarator Core Systems				
11 - In-Vessel Components				
111 - Limiters				
First Wall Components				
111-001	Title I design WBS 111 limiters	03FEB03*	30APR03	21,[illegible]25
111-011	Title II design WBS 111 limiters	01JUL04*	29SEP04	47,106.70
111-021	In-house R&D	03FEB03*	23APR03	12,685.73
111-031	Title III engr	03OCT05*	31MAR06	18,340.29
111-037	First Wall Panels Procurement	03OCT05*	23DEC05	89,390.95
111-041	In-house Fab/assy	26DEC05	20JAN06	11,521.28
PFC Local I&C				
116-001	Title I design WBS 116 PFC local I&C	03FEB03*	29APR03	12,953.93
116-011	Title II design WBS 116 PFC local I&C	01JUL04*	29SEP04	14,082.39
116-012	FDR Limiters WBS 111 and 116		29SEP04	0.00
116-031	Title III engr	03OCT05*	17MAR06	3,434.92
116-037	PFC Local I&C Procurement	03OCT05*	23DEC05	4,808.51
116-041	In-house Fab/assy	26DEC05	20JAN06	4,412.32
12 - Vacuum Vessel Systems				
121 - Vacuum Vessel Assembly				
Design				
121-001	Title I design WBS 121 vac vsl	01OCT02*	01MAY03	166,504.88
121-002	WBS 12 and 14 concurrent PDR IA		02MAY03	0.00
121-011	Title II design WBS 121 vac vsl	05MAY03	02DEC03	189,282.46
121-012	WBS 121 vac vsl sheel FDR		02DEC03	0.00
121-032	Select Vendors for R&D	01OCT02*	30DEC02	0.00
121-033	Award 2 Vendors for R&D	31DEC02	20JAN03	0.00
121-034	Vendor R&D (1/A)	21JAN03	29SEP03	651,756.16



Run Date 01AUG02 08:40	**NCSX**	NXA2	**ATTACHMENT B** Sheet 1 of 40
	FY03 Schedule Guidance		

ATTACHMENT C



Example "H" Work Authorization Form (WAF)

Activity ID	Activity Description	Baseline Start	Baseline Finish	Baseli Budg	FY03 / FY04
Cost Center: 1850 - NCSX Advanced Concep Design					
Work Package: 1*-Stellarator core**					
Job: 1406 - Mod. Coil Winding R&D-CHRZANOWSKI					
141-1-3.1	Fabricate Tensile Test Specimens (SOW 4.6)		30JAN03*	0.00	
141-1-4	S/C test specimens	31JAN03	27FEB03	13,650.00	M&S= $10k
141-1-5	Oversee s/c test and write report	31JAN03	20MAR03	24,048.00	ZATZ =160 hrs
141-2-1	Develop VPI mold & impregnation techniques	01OCT02*	31MAR03	155,388.69	KEARNS=496hr ; MACHINIST=863hr ; MEIGHAN=200hr ; CHRZANOWSKI =100hr ;
141-2-1.01	CTD consultant	02DEC02*	31MAR03	54,600.00	SC=40$k ;
141-2-1.1	Select Epoxy Resin System (SOW 4.3)		03MAR03*	0.00	
141-2-2	Receive, inspect and VPI test coil wound at UT	01NOV02*	09DEC02	33,372.60	KEARNS=80hr ;Meighan=100hr ; CHRZANOWSKI =80hr ;FOM TECHS TB=80
141-2-2.1	VPI of test Coil from UT (SOW 4.5)		09DEC02	0.00	
141-2-3	Perform conductor Keystone tests	17JAN03*	14MAR03	96,816.24	KEARNS=288hr ; MEIGHAN=288hr ; CHRZANOWSKI =100hr ;Gifford=288 Raftopolous=80
141-2-3.1	Keystone tests complete (SOW 4.7)		31MAR03*	0.00	
141-2-4	Perform VPI and winding testing	27JAN03*	01JUL03	195,301.28	KEARNS=864hr ;GIFFORD=288hr ; CHRZANOWSKI =160hr ; MEIGHAN=688hr ;
141-2-4.1	Prelim VPI Process for Mod Coils (SOW 4.4)		31MAR03*	0.00	
141-2-5	Develop winding and VPI procedures for prototype	02JUN03*	03SEP03	15,030.00	CHRZANOWSKI =100hr ;
141-2-5.1	Final VPI Process for Mod Coils (SOW 4.4)		03SEP03*	0.00	
141-QPS-1	Wind 2nd Test Coil @ PPPL	06JAN03*	13JAN03	6,951.20	KEARNS=40hr ;GIFFORD=40hrs CHRZANOWSKI =8
141-QPS-2	VPI 2nd Test Coil	20JAN03*	24JAN03	4,237.36	KEARNS=24hr ;GIFFORD=24hrs MEIGHAN=8hr ;
141-QPS-3	Wind (4) conductor Coil	03FEB03*	10FEB03	8,153.60	KEARNS=40hr ;GIFFORD=40hrs CHRZANOWSKI =16hr
141-QPS-4	VPI (4) Conductor Coil	17FEB03*	21FEB03	4,237.36	KEARNS=24hr ;GIFFORD=24hrs MEIGHAN=8hr ;
Subtotal		01OCT02	03SEP03	611,786.33	

PRINCETON PLASMA PHYSICS LABORATORY
Proper Classification of Capital and Operating Expenditures for NCSX

Capital and Operating Expenditures for NCSX

Example "I"
Excerpt from the
NCSX costing
guidelines
(ref on file)

Below are descriptions of the types of costs that should be classified as capital or operating expenditures for the design, fabrication and research preparations for the National Compact Stellarator Experiment (NCSX). The NCSX Project is identified as a Major Item of Equipment (MIE), meaning that DOE is providing Capital Equipment funding for the costs of the project normally associated with the project's Total Estimated Cost (TEC), including associated manufacturing development and prototypes in support of Title I and Title II design activities. The scope of the NCSX MIE Project is defined in Annex I to the NCSX Project Execution Plan (PEP). However, the engineering and fabrication costs of any machine upgrades (e.g., diagnostics, PFCs, plasma control systems, heating systems, etc.) that are not included in the NCSX MIE Project scope, but which may be started prior to first plasma in order to be available later in the research program, will be established as separate projects from the NCSX MIE Project and will be funded separately, either by additional contributed funds or appropriated

The **capital** expenditures for the NCSX MIE Project include:

- **Title I Design** – The preliminary stage of project design.
- **Title II Design** – The definitive stage of project design.
- **Title III** - Engineering support of fabrication and assembly project and the inspection portion of project engineering, design, and inspection.
- **Manufacturing Development** - Manufacturing studies, development and prototyping in support of Title I and Title II Design.
- **Fabrication and Assembly** – Generally includes all costs for fabrication and assembly equipment, materials and components.
- **Fabrication And Assembly Management** – Covers services for management of the fabrication and assembly effort during Title I and Title II Design and continuing through the completion of fabrication and assembly of the project.
- **Commissioning and Integrated Systems Testing** - These costs include the efforts to commission subsystems and perform integrated systems tests
- **Project and Engineering Management –** These costs include services provided by project and engineering management beginning at the start of Title I design and continuing through the completion of assembly for planning, organizing, directing, controlling and reporting on the status of the project.
- **Project Physics** costs include those efforts directly related to setting physics requirements and the physics analyses in support of design and fabrication.

The **operating** expenditures include:

- **Pre-Title I Activities** - All activities taking place prior to the start of preliminary design, including advanced conceptual design activities occurring pending approval to start Title I Design.
- **Research Planning and Preparation for Operations –** Includes one-time costs incurred for research planning and preparation for operations from the start of the

Ron Strykowsky

From: Ron Strykowsky [rstrykowsky@pppl.gov]
Sent: Friday, January 31, 2003 11:40 AM
To: nelsonbe@ornl.gov; williamsonde@ornl.gov; goransonpl@y12.doe.gov; ggettelfinger@pppl.gov; jchrzano@pppl.gov; rfeder@pppl.gov; mkalish@pppl.gov; colemj@ornl.gov; sramakrishnan@pppl.gov; goliaro@pppl.gov; eperry@pppl.gov; tstevenson@pppl.gov; djohnson@pppl.gov; wreiersen@pppl.gov; ldudek@pppl.gov
Cc: bensonrd@ornl.gov; pheitzenroeder@pppl.gov; lyonjf@ornl.gov; hneilson@pppl.gov; bsimmons@pppl.gov; rstrykowsky@pppl.gov; phampton@pppl.gov; jschmidt@pppl.gov; mwilliams@pppl.gov; mzarnstorff@pppl.gov
Subject: NCSX JANUARY STATUS

NCSX Status Form 013103.xls

ncsx status ɔarcharts 013103.p..

Folks, Keeping with the approach we took last month, I'll be collecting your schedule progress electronically.

I ask that you provide me with schedule progress (starts & finishes) as well as percent completions for tasks in your jobs. You may use either the attached .PDF file bar chart format and fax/hand carry back to me OR use the attached Excel spreadsheet to provide me with your progress, your choice! Make sure you provide input to ALL tasks that should have been started by February 1st. Note in the Excel spreadsheet I've highlighted the tasks in yellow and green that require feedback from you.

I'll provide cost reports when available.

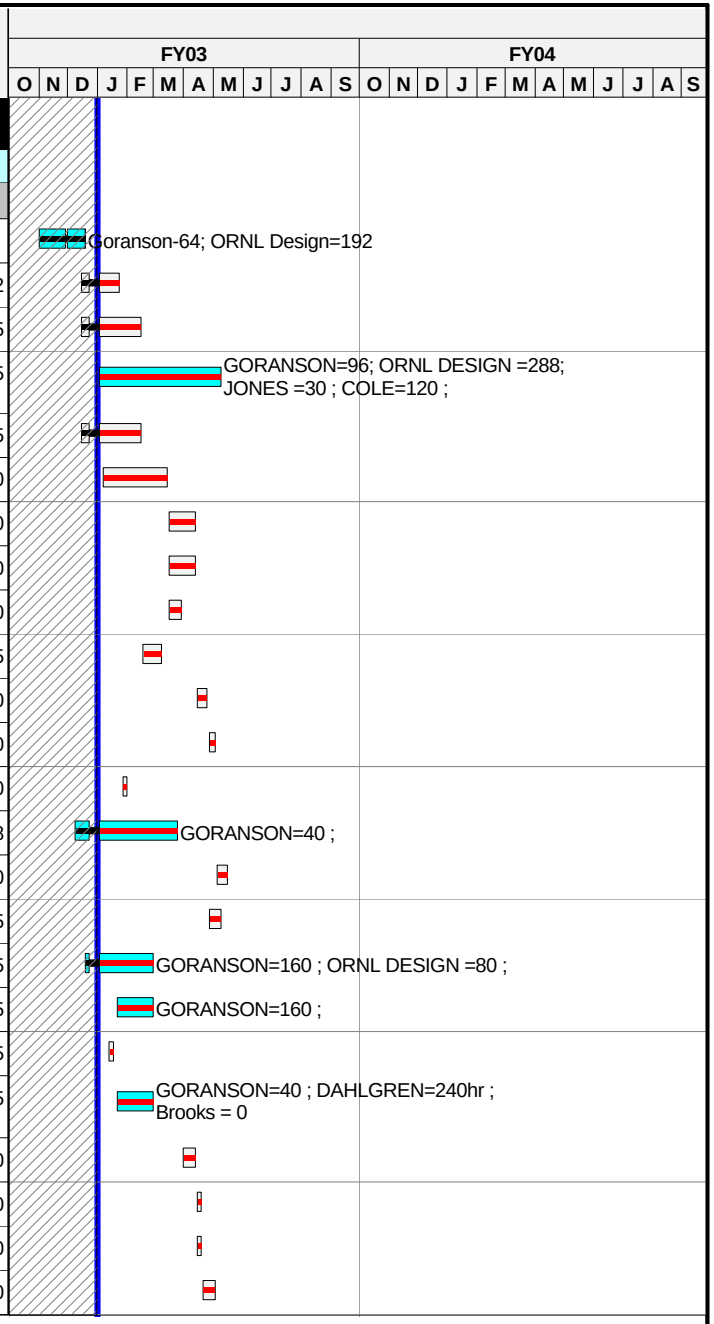
PLEASE PROVIDE ME YOUR INPUT BY WEDNESDAY FEBRUARY 5th.

Example "J.1" □

Call for Monthly □

Progress Status

Activity ID	Activity Description	Baseline Start	Baseline Finish	% Cmplt	Earned value (BCWP)	Baseline Budget	Total Float
Cost Center: 1850 - NCSX Advanced Concep Design							
Work Package: 1*-Stellarator core**							
Job: 1201 - Vacuum Vessel Dsn-GORANSON							
L4-001	Reconstruct conceptual design of stellarator cor	01NOV02A	18DEC02A	100	29,760.00	29,760.00	
L4-002	Define modular coil winding geometry	16DEC02A	22JAN03	-	0.00	0.00	82
L4-003	Define VV shell and FW geometry	16DEC02A	14FEB03	-	0.00	0.00	15
L4-041	Desi or	2 *	9	0	0.00	64,470.00	5
L4-042	Es	16DE	EB03	-	0.00	0.00	25
L4-043	Develop design of bolted angled joint	06JAN03*	14MAR03	-	0.00	0.00	0
L4-044	Build geometric mock-up to demo feasibility	17MAR03*	11APR03	-	0.00	0.00	0
L4-045	Es	17			0.00	0.00	0
L4-046	Re	17	2		0.00	0.00	0
L4-047	Establish envelopes & locations in vsl cmpnts	17FEB03*	07MAR03	-	0.00	0.00	25
L4-048	Establish port allocations	14APR03*	25APR03	-	0.00	0.00	0
L4-049	Pe m FMECA	28APR03*	02MAY03	-	0.00	0.00	0
L4-050	Es		AN03	-	0.00	0.00	70
L4-053.5	Prepare performance (de n to) specificatio	09DEC02A	25MAR03	25	1,350.00	5,400.00	28
L4-052	Evaluate design versus performance reqmnts	05MAY03*	16MAY03	-	0.00	0.00	0
L4-053	Review and promote models/drawings	28APR03*	09MAY03	-	0.00	0.00	5
L4-071.5	Dev	9	FB	2	7,600.00	30,400.00	55
L4-069	Perf	2 *	2		0.00	21,600.00	55
L4-071	Calculate Heat leakage to cold mass	13JAN03*	17JAN03	-	0.00	0.00	75
L4-064	Perform EM & Stress Analysis of VV	22JAN03*	28FEB03	0	0.00	42,014.40	45
L4-065	Develop FEA model incl supports	31MAR03*	11APR03	-	0.00	0.00	0
L4-066	Calc. buckling FOS &stresses under atmosp	14APR03*	18APR03	-	0.00	0.00	0
L4-067	Calculate disruption loads	14APR03*	18APR03	-	0.00	0.00	0
L4-068	Calculate stresses under combined loads	21APR03*	02MAY03	-	0.00	0.00	0



Example "1.2"
Barchart issued
for progress
status markup

Run Date 16JAN03 15:48

Early Bar
target
Progress Bar
Critical Activity

021X

NCSX

FY03 Work Authorization Plan

STATUS 1/2/03

NCSX STATUS THROUGH JANUARY 31, 2003

	ID	Description	Baseline Start	-	Actual/Forecast Start	baseline Finish		Actual/Forecast Finish	Percent Complete
Job: 1201 - Vacuum Vessel Dsn-GORANSON									
	123-1-1	Schematics and CAD assembly drawing of piping	19-Dec-02	A	**19-Dec-02**	28-Feb-03			**5**
	123-1-2	Flow analysis	19-Dec-02	A	**19-Dec-02**	28-Mar-03			**3**
	L4-001	Reconstruct conceptual design of stellarator cor	01-Nov-02	A	**01-Nov-02**	18-Dec-02	A	**18-Dec-02**	**100**
	L4-002	Define modular coil winding geometry	16-Dec-02	A	**16-Dec-02**	22-Jan-03			**25**
	L4-003	Define VV shell and FW geometry	16-Dec-02	A	**16-Dec-02**	14-Feb-03			**14**
	L4-041	Design of VV	02-Jan-03			09-May-03			-
	L4-042	Establish final port geometry	16-Dec-02	A	**16-Dec-02**	14-Feb-03			**14**
	[illegible]	[illegible] design of bolted angle joint	06-Jan-03			14-Mar-03			-
	[illegible]	[illegible] metric mock-up to demo feasibility	17-Mar-03			11-Apr-03			-
	[illegible]	Establish feasibility of swiping vac seals	17-Mar-03			11-Apr-03			-
	L4-046	Resolve interference with VV supports	17-Mar-03			28-Mar-03			-
	L4-047	Establish envelopes & locations in vsl cmpnts	17-Feb-03			07-Mar-03			-
	L4-048	Establish port allocations	14-Apr-03			25-Apr-03			-
	[illegible]	[illegible]	28-Apr-03			02-May-03			-
	[illegible]0	[illegible] instrumentation requirements	27-Jan-03			31-Jan-03			-
	[illegible]	Prepare performance (design-to) specification fo	09-Dec-02	A	**09-Dec-02**	25-Mar-03			**15**
	L4-052	Evaluate design versus performance reqmnts	05-May-03			16-May-03			-
	L4-053	Review and promote models/drawings	28-Apr-03			09-May-03			-
	L4-071.5	Develop design for VV insulation & attachments	19-Dec-02	A	**19-Dec-02**	28-Feb-03			**5**
	[illegible]	[illegible] thermal analysis of	22-Jan-03			28-Feb-03			-
	[illegible]	[illegible] heat load [illegible] mass	13-Jan-03			17-Jan-03			-
	[illegible]	Perform EM & Stress Analysis of VV	22-Jan-03			28-Feb-03			-
	L4-065	Develop FEA model incl supports	31-Mar-03			11-Apr-03			-
	L4-066	Calc. buckling FOS &stresses under atmosp	14-Apr-03			18-Apr-03			-
	L4-067	Calculate disruption loads	14-Apr-03			18-Apr-03			-
	[illegible]8	[illegible] under combined loads	21-Apr-03			02-May-03			-
	[illegible]4	[illegible]	02-Jan-03			14-May-03			-
	[illegible]55	Prepare Scope sheet items PFC's (WBS 12/11)	14-Apr-03			25-Apr-03			-
	L4-056	Prepare Scope sheet items (WBS 12/14)	05-May-03			16-May-03			-
	L4-057	Prepare Scope sheet items 12/21-23	28-Apr-03			02-May-03			-
	L4-058	Prepare Scope sheet items ICH (WBS12/24)	16-Jan-03			22-Jan-03			-
	[illegible]9	Prepare Scope sheet items [illegible]	20-Jan-03			24-Jan-03			-
	[illegible]0	Prepare Scope sheet items [illegible]	28-Apr-03			16-May-03			-
	[illegible]1	Prepare Scope sheet item grounding (WBS 12/4)	17-Feb-03			21-Feb-03			-
	L4-062	Prepare Scope sheet items I&C (WBS 12/5)	03-Feb-03			07-Feb-03			-

Example "1.3" Alternate method for reporting progress status

JCRPT JOB COST REPORT AS OF 020103

JOB# 1405 MOD COIL WINDING R&D PREP

COST CENTER 1850 WK PKG 1***

REV # ? HOURLY (PG 1) THRU 01/19/03

REVISION DATE ? SUBCONTRACT (PG 4) THRU 01/26/03

ENGR NO NAME FOUND WEEKLY-EBASCO (PG 5) THRU 09/30/95

REQ BY NO NAME FOUND BI-WEEKLY-A (PG 6) THRU 01/19/03

START DATE ? BI-WEEKLY-B (PG 7) THRU 01/19/03

PRIORITY ? [illegible] THRU 01/03/

ESTIMATE DATE ?

ESTIMATED COMP DT ?

****

FOR FY 03 ONLY

EXP CL		APPROVED ESTIMATE	CUR MTH EXPEND	YTD COSTS	REQS + ENCUMB	BALANCE
23	FAB,OPS & MAINT DIV LAB &	135600	24982	66709	0	68891
25	ELECTRICAL DIV LABOR & BEN	0	0	283	0	283-
26	MECHANICAL DIV LABOR & BEN	60600	7502	49420	0	11180
31	TECH CENTER OVERTIME & BEN	0	974	2237	0	2237-
35	TRAVEL	0	383	719	0	719-
37	STOCKROOM WITHDRAWALS	0	1762	2120	0	2120-
38	CREDIT CARD EXPENDITURES M	0	0	295	0	295-
39	OTHER EXPENSE	0	16	16	0	16-
41	MATERIALS & SERVICES	122000	30554	31180	0	90820
43	CREDIT CARD EXPENDITURES V	0	3536	9200	0	9200-
53	TECH CENTER BURDEN	23703	3943	14777	0	8926
62	ONSITE G&A	150634	25892	92102	0	58532
64	MHX G&A	39040	11473	13600	0	25440
TOTAL		531577	111017	282658	0	248919

INCOMPLETE ORDERS AND REQUISITIONS ARE LISTED BELOW.THEY ARE ALSO INCLUDED IN THE TOTALS "COST + PO + REQ" TO THE LEFT (IN FY 03).

P/O # CL	EXP DATE	P/O FY AMOUNT	P/O OUTSTANDING AMOUNT	REQ #	VENDOR#
PE39940	41 01023 3	18680	0	R359244	116366
PE39970	41 12192 3	4050	0	R359245	116365
**** TOTAL-		22730	0		

"CURR" PERIOD IS MONTH 01 AND YEAR 03 --- UNITS ARE HR

PG	HOD	STF	CLASS	EXP	STRAIGHT CUR	STRAIGHT CUM	OVERTIME CUR	OVERTIME CUM
JURCZYNSKI	8	EMC*	SM	2311	0.0	4.3	0.0	0.0
MEIGHAN	8	EMC*	SM	2311	86.7	147.3	0.0	0.0
CIEBIERA	8	EME*	SM	2311	34.7	130.0	0.0	0.0
[illegible]	8	EMT*	SM	2311	[illegible]	[illegible]	0.0	0.0
[illegible]	8	EMT*	SM	2311	[illegible]	[illegible]	0.0	0.0
KEMP	8	EMT*	SM	2311	34.7	69.3	0.0	0.0
MOUNT JR	8	EMT*	SM	2311	104.0	370.5	0.0	0.0
SMITH	8	EMT*	SM	2311	17.4	69.7	0.0	0.0
[illegible]	6	EMT*	TB	2311	6.[illegible]	[illegible]	[illegible]	0.0
BURCHILL	6	EMT*	TB	2311	8.0	20.0	0.0	0.0
CLARK	6	EMT*	TB	2311	4.0	4.0	0.0	0.0
HORNER	6	EMT*	TB	2311	59.4	120.7	9.6	14.3
SIMMONDS JR	6	EMT*	TB	2311	19.8	23.8	4.2	4.2
STEER	6	EMT*	TB	2311	8.0	55.3	0.0	8.7
TRAFALSKI	6	EMT*	TB	2311	0.0	28.0	0.0	0.0
TUCKER	6	EMT*	TB	2311	57.6	122.9	6.4	17.1
GILTON	6	EEH*	TB	2511	0.0	7.3	0.0	0.7
CHRZANOWSKI	8	EAD*	EM	2611	43.3	182.0	0.0	0.0
RAFTOPOULOS	8	EAD*	EM	2611	26.0	164.7	0.0	0.0
PAUL	8	EADD	DM	2611	39.0	425.1	0.0	0.0

Example "K"

Job Cost report showing monthly & year-to-date cost for PPPL charges

ORNL COMPACT STELLARATOR SUPPORT NCSX - MONTHLY COST - FY 2003

ADVANCED CONCEPTUAL DESIGN - 3560300

AT501502

OPERATING FUNDS

														PROPOSED		
														Adjusted		ORNL/ENGR
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total	Budget	% Used	Account
	Work Package																
Limiter Design	WBS 1101																3560030A
(Goranson)	Labor	0	0	0	0	0	0	0	0	0	0	0	0	0		#DIV/0!	
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	0	0	0	0	0	0	0	0	0	0	0	0	0	40000	0.00%	
Vacuum Vessel Design	WBS 1201																3560030B
(Goranson)	Labor	6028	12677	12354	20325	0	0	0	0	0	0	0	0	51384			PEX00263
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	6028	12677	12354	20325	0	0	0	0	0	0	0	0	51384	96000	53.53%	
Vacuum Vessel R & D	WBS 1202																3560030C
(Goranson)	Labor	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	0	0	0	0	0	0	0	0	0	0	0	0	0	40000	0.00%	
Modular Coils Design	WBS 1401																3560030D
(Williamson)	Labor	14329	18677	20619	19611	0	0	0	0	0	0	0	0				PEX00264
	Material	0	0	8960	4027	0	0	0	0	0	0	0	0				
	Sub	14329	18677	29579	23638	0	0	0	0	0	0	0	0			48.99%	
Modular Coil Analysis	WBS 1402																3560030E
(Williamson)	Labor	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	0	0	0	0	0	0	0	0	0	0	0	0	0	40000	0.00%	
Modular Coil Winding Forms	WBS 1404																3560030F
(Williamson)	Labor	12558	6056	3045	7431	0	0	0	0	0	0	0	0	29090			
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	12558	6056	3045	7431	0	0	0	0	0	0	0	0	29090	80000	36.36%	
Stellarator Core Management	WBS 1901																3560030G
and Integration	Labor	19432	7118	16366	16728	0	0	0	0	0	0	0	0	59644			PEX00265
	Material	0	0	10533	0	0	0	0	0	0	0	0	0	10533			
	Sub	19432	7118	26899	16728	0	0	0	0	0	0	0	0	70177	176000	39.87%	
Project Management and	WBS 8102																3560030H
Control	Labor	5911	15293	13670	7385	0	0	0	0	0	0	0	0	42259			
(Lyon, Benson, Akers)	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	5911	15293	13670	7385	0	0	0	0	0	0	0	0	42259	32000	132.06%	
Project Physics (Off-Site)	WBS 8402																3560030I
(Lazarus)	Labor	1175	-118	0	0	0	0	0	0	0	0	0	0	1057			
	Material	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Sub	1175	-118	0	0	0	0	0	0	0	0	0	0	1057	55000	1.92%	
Program		848	1573	1808	1515	0	0	0	0	0	0	0	0	5744	15000	38.29%	33440940
Administration																	
GRAND	TOTAL	60281	61276	87355	77022	0	0	0	0	0	0	0	0	285934	750000	38.12%	

Ron Strykowsky

From: Ron Strykowsky [rstrykowsky@pppl.gov]
Sent: Tuesday, February 11, 2003 2:42 PM
To: nelsonbe@ornl.gov; williamsonde@ornl.gov; goransonpl@y12.doe.gov; ggettelfinger@pppl.gov; jchrzano@pppl.gov; rfeder@pppl.gov; mkalish@pppl.gov; colemj@ornl.gov; sramakrishnan@pppl.gov; goliaro@pppl.gov; eperry@pppl.gov; tstevenson@pppl.gov; djohnson@pppl.gov
Cc: bensonrd@ornl.gov; pheitzenroeder@pppl.gov; lyonjf@ornl.gov; hneilson@pppl.gov; cneumeyer@pppl.gov; reiersen@pppl.gov; bsimmons@pppl.gov; rstrykowsky@pppl.gov; ldudek@pppl.gov; phampton@pppl.gov; jschmidt@pppl.gov; mwilliams@pppl.gov; mzarnstorff@pppl.gov
Subject: NCSX JANUARY STATUS RESULTS

NCSX CPR status FEB 1 2003 021...

Folks, Attached is the current progress assessment of NCSX. This material reflects progress status through January 2003 that you reported against your jobs.
In short, we're about 2 months behind our original baseline plan (May PDR) but we're still on track for a June 23rd VV/MCC PDR. (see detailed barcharts for specific task progress).
The project's cost performance is good. The Cost Performance Index (CPI) = .96, which translates into accomplishing $96 worth of work for every $100 spent
I've include a summary analysis on page 6 that breaks out the major variances and critical issues.

Ron

Example "M.1" □ Issuance of progress □ status results to project

PrincetonUniversity Plasma Physics Laboratory

PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTU

NCSX

******* Fiscal Year 03 only *******

JANUARY FY03

	CURRENT PERIOD			CUMULATIVE TO DATE							FY03		
	Budgeted Cost			Budgeted Cost			VARIANCES				Budget		
	BCWS	BCWP	ACWP	BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI	Baseline	Forecast	Vari
PPPL and ORNL	$K			$K							$K	$K	
Advanced Conceptual Design													
1 - Stellarator Core Systems	609	320	314	1,532	1,095	1,095	-437	.71	0	1.00	7,061	7,061	
11 In-Vessel Components	0	0		3	0		-2	.17	0		18	18	
1101 - Limiter Advanced Concep Design	0	0		3	0		-2	.17	0		18	18	
1102 - Limiter Prelim & Final Design													
12 Vacuum Vessel Systems	119	32	25	232	107	90	-124	.46	17	1.19	1,106	1,106	
1201 - Vacuum Vessel Dsn	105	20	25	180	64	78	-116	.36	-14	.83	378	378	
1202 - Vacuum Vessel R&D	14	12		51	43	12	-8	.83	31	3.54	625	625	
1203 - Vacuum Vessel Final Dsn											102	102	
13 Conventional Coils	15		4	21	7	15	-13	.35	-7	.50	432	432	
1301 - Convential Coils Design	15		4	21	7	15	-13	.35	-7	.50	432	432	
14 Modular Coils	387	262	254	1,044	889	851	-155	.85	38	1.04	4,353	4,353	
1401 - Mod. Coil Design (casting&winding)	63	25	24	171	72	97	-99	.42	-25	.75	364	364	
1402 - Mod.Coil Analyses	49	13	20	97	101	113	3	1.03	-13	.89	201	201	
1403 - Mod. Coil Final Design											358	358	
1404 - Mod. Coil Winding Form R&D	22	13	23	66	44	97	-21	.67	-53	.46	1,751	1,751	
1405 - Mod. Coil Winding R&D Prep	97	114	111	336	294	283	-58	1.17	111	1.39	530	530	
1406 - Mod. Coil Winding R&D	1	2	3	11	14	18	3	1.66	-38	.79	618	618	
1407 - Mod. Coil Winding Facil	4	7	4	13	13	8	-5	.85	55	1.66	531	531	
1408 -Mod. Coil Prototype Coil													
15 1501 - Structures Design	7	1	4	19	13	18	-6	.70	-5	.74	283	283	
16 1601 - Coil Services Design	12			12			-12				89	89	
17 1701 - Cryostat & Base Support Struct Dsn	14			26		1	-26		-1		141	141	
18 1801 - Field Period Assembly D	5			12		1	-12		-1		93	93	
19 1901 - Stellarator Core Manage	5	24	27	164	78	119	-86	.47	-41	.65	547	547	
2 - Plasma Heating, Fueling & Vac Syste	7		14	82	9	30	-73	.11	-22	.29	288	288	
2001 - VPS,Gas & Cond sys D	0		1	6	0	1	-5	.07	0	.58	22	22	
2501 - Neutral Beam Refurbishment	45	7	13	76	8	30	-68	.11	-21	.28	266	266	
3 - Diagnostics	23	25	17	101	54	80	-47	.53	-26	.67	225	225	
39 3901 - Diagnostics systems Integration	23	25	17	101	54	80	-47	.53	-26	.67	225	225	
4 - Electrical Power Systems	3	1	2	39	1	2	-37	.04	0	.86	257	257	
43 4301 - Electrical Dsn DC Syste	2	1	2	1	1	2	0	.07	0	.86	125	125	
44 4401 - Electrical Dsn Control &											23	23	
45 4501 - Electr System Design &	3						-7				66	66	
46 4601 - FCPC Bldg Modifications											42	42	
5 - Central I&C Systems	2			6			-6				24	24	
58 5801 - Central I&C Integration & Oversight	2			6			-6				24	24	
6 - Facility Systems	10	5		21	13	8	-8	.62	6	1.77	66	66	
65 6501 - Facility Systems Integra	10			21	13	8	-8	.62	6	1.77	66	66	
7 - Test Cell Preparation and Machine A	7			15	15	9	0	1.00	5	1.56	109	109	
71 7101 - Shield Wall Modification D											51	51	
74 7401 - TC Prep & Mach Assy Plan&Oversight	6	6	3	15	15	9	0	1.00	5	1.56	58	58	
8 - Project Oversight and Support	180	235	127	675	612	656	-63	.91	-44	.93	1,882	1,882	
81 Project Management and Control	71	71	51	257	257	262	0	1.00	-5	.98	800	800	
8101 - Project Management and	5	2	34	185	185	179	0	1.00	5	1.03	579	579	
8102 - NCSX MIE Management	0	0	9	37	37	48	0	1.00	-11	.78	109	109	
8998 - Allocations	0	0	7	35	35	35	0	1.00	1	1.02	111	111	
82 Project Engineering	77	132	56	301	238	261	-63	.79	-23	.91	732	732	
8202 - Engineering Mgmt & Sys Engr Support	50	91	40	193	165	188	-28	.85	-23	.88	445	445	
8203 - Design Integration	15	38	14	54	54	56	0	1.00	-2	.96	168	168	
8204 - Systems Analysis	12	3	3	55	19	17	-35	.36	2	1.12	119	119	
84 Project Physics	32	32	21	116	116	133	0	1.00	-17	.87	350	350	
8401 - Project Physcis	22	22	21	80	80	132	0	1.00	-52	.61	251	251	
8402 - Project Physics MIE ORNL	9	9		36	36	1	0	1.00	35	34.24	99	99	
Subtotal	910	599	477	2,470	1,799	1,881	-671	.73	-82	.96	9,912	9,912	
Contingency													
Management Reserve											1,635	1,635	
TOTAL PPPL/ORNL											**11,546**	**11,546**	
Funding													
Financial Plan BA											10,858	10,858	
FY02 Carryover											443	443	
Rate Adjustment setaside											262	262	
ERWM Allocation Increment]													
TOTAL PPPL/ORNL FUNDING											**11,563**	**11,563**	

PrincetonUniversity Plasma Physics Laboratory

PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTU

NCSX

****** *Fiscal Year 03 only* ******

JANUARY FY03

	CURRENT PERIOD			CUMULATIVE TO DATE							FY03		
	Budgeted Cost			Budgeted Cost			VARIANCES				Budget		
	BCWS	BCWP	ACWP	BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI	Baseline	Forecast	Vari
PPPL													
Advanced Conceptual Design													
1 - Stellarator Core Systems	415	238	246	1,039	830	859	-210	.80	-29	.97	5,545	5,545	
11 In-Vessel Components													
1101 - Limiter Advanced Concep Design													
1102 - Limiter Prelim & Final Design													
12 Vacuum Vessel Systems	20	4	5	34	12	39	-22	.36	-26	.31	635	635	
1201 - Vacuum Vessel Dsn	20	1	5	22	2	26	-19	.11	-24	.09	55	55	
1202 - Vacuum Vessel R&D		3		12	10	12	-3	.80	-2	.80	565	565	
1203 - Vacuum Vessel Final Dsn											15	15	
13 Conventional Coils	15		4	21	7	15	-13	.35	-7	.50	419	419	
1301 - Convential Coils Design	15		4	21	7	15	-13	.35	-7	.50	419	419	
14 Modular Coils	316	233	223	845	797	736	-48	.94	61	1.08	3,664	3,664	
1401 - Mod. Coil Design (casting&winding)	3			3		11	-3		-11		7	7	
1402 - Mod.Coil Analyses	39	13	20	87	101	113	13	1.15	-13	.89	175	175	
1403 - Mod. Coil Final Design											110	110	
1404 - Mod. Coil Winding Form R&D	21	9	16	45	24	68	21	.54	-44	.35	1,694	1,694	
1405 - Mod. Coil Winding R&D Prep	9	[illegible]	[illegible]	[illegible]	[illegible]	83	-38	1	11[illegible]	.3[illegible]	530	530	
1406 - Mod. Coil Winding R&D		3		2	[illegible]	78	-71	[illegible]	-38	.79	618	618	
1407 - Mod. Coil Winding Facility	[illegible]	7	4	[illegible]	[illegible]	83	-25	3	[illegible]	.66	531	531	
1408 -Mod. Coil Prototype Coil Winding													
15 1501 - Structures Design	7	1	4	19	13	18	-6	.70	-5	.74	270	270	
16 1601 - Coil Services Design	12			12			-12				89	89	
17 1701 - Cryostat & Base Support Struct Dsn	14			26		1	26		-1		141	141	
18 1801 - Field Period Assembly Design	[illegible]			[illegible]			-1		-1		93	93	
19 1901 - Stellarator Core Management&Integr	2		11	0		19	[illegible]		-48		235	235	
2 - Plasma Heating, Fueling & Vac Systems	[illegible]	7	[illegible]	82	[illegible]	[illegible]	3	1	[illegible]	.29	288	288	
2001 - VPS,Gas & Cond sys Design/Oversigh	6	0	1	6	0	1	-5	.07	0	.58	22	22	
2501 - Neutral Beam Refurbishment	45	7	13	76	8	30	-68	.11	-21	.28	266	266	
3 - Diagnostics	23	25	17	101	54	80	-47	.53	-26	.67	225	225	
39 3901 - Diagnostics systems Integration	23	25	17	101	54	80	-47	.53	-26	.67	225	225	
4 - Electrical Power Systems	3[illegible]	[illegible]	[illegible]	39	[illegible]	[illegible]	[illegible]	[illegible]	0	.86	257	257	
43 4301 - Electrical Dsn DC SystemsWBS 432&	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.86	125	125	
44 4401 - Electrical Dsn Control & Protection											23	23	
45 4501 - Electr System Design & Integration	8			17			17				66	66	
46 4601 - FCPC Bldg Modifications											42	42	
5 - Central I&C Systems	2			6			-6				24	24	
58 5801 - Central I&C Integration & Oversight	2			6			-6				24	24	
6 - Facility Systems	10	[illegible]		21	13	8	-8	.62	6	1.77	66	66	
65 6501 - Facility Systems Integration				21	13	8	-8	.62	6	1.77	66	66	
7 - Test Cell Preparation and Machine Assy	[illegible]	[illegible]		15	15	9	0	1.00	5	1.56	109	109	
71 7101 - Shield Wall Modifications Design											51	51	
74 7401 - TC Prep & Mach Assy Plan&Oversight	6	6	3	15	15	9	0	1.00	5	1.56	58	58	
8 - Project Oversight and Support	161	215	118	601	538	607	-63	.90	-69	.89	1,674	1,674	
81 Project Management and Control	61	62	42	220	220	214	0	1.00	6	1.03	691	691	
8101 - Project Management and Control	51	52	34	185	185	179	0	1.00	5	1.03	579	579	
8102 - NCSX MIE Management ORNL													
8998 - Allocations	10	10	7	35	35	35	0	1.00	1	1.02	111	111	
82 Project Engineering	77	132	56	301	238	261	-63	.79	-23	.91	732	732	
8202 - Engineering Mgmt & Sys Engr Support	50	91	40	193	165	188	-28	.85	-23	.88	445	445	
8203 - Design Integration	15	38	14	54	54	56	0	1.00	-2	.96	168	168	
8204 - Systems Analysis	12	3	3	55	19	17	-35	.36	2	1.12	119	119	
84 Project Physics	22	22	21	80	80	132	0	1.00	-52	.61	251	251	
8401 - Project Physcis	22	22	21	80	80	132	0	1.00	-52	.61	251	251	
8402 - Project Physics MIE ORNL													
Subtotal	697	498	400	1,904	1,461	1,595	-444	.77	-135	.92	8,187	8,187	
Contingency													
Management Reserve											1,438	1,438	
TOTAL PPPL											9,625	9,625	
Funding													
Financial Plan BA											9,067	9,067	
January Fin Plan											-130	-130	
FY02 Carryover											+ 443	443	
Rate Adjustment setaside											+ 262	262	
TOTAL PPPL FUNDING											9,642	9,642	

PrincetonUniversity Plasma Physics Laboratory

PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTU

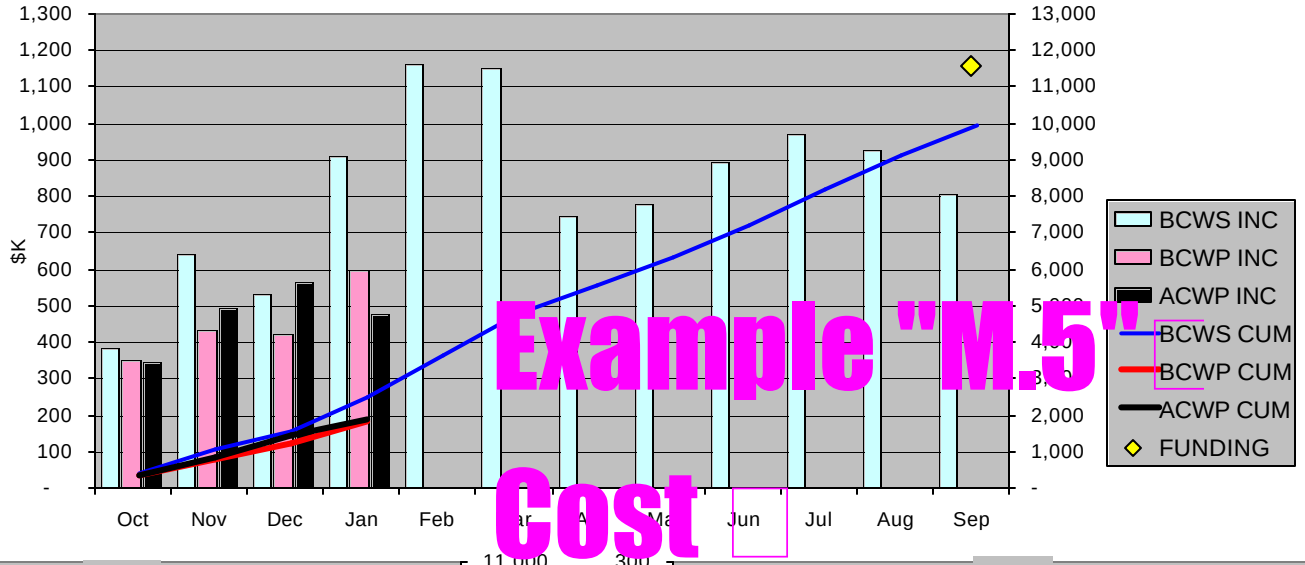
NCSX

****** *Fiscal Year 03 only* ******

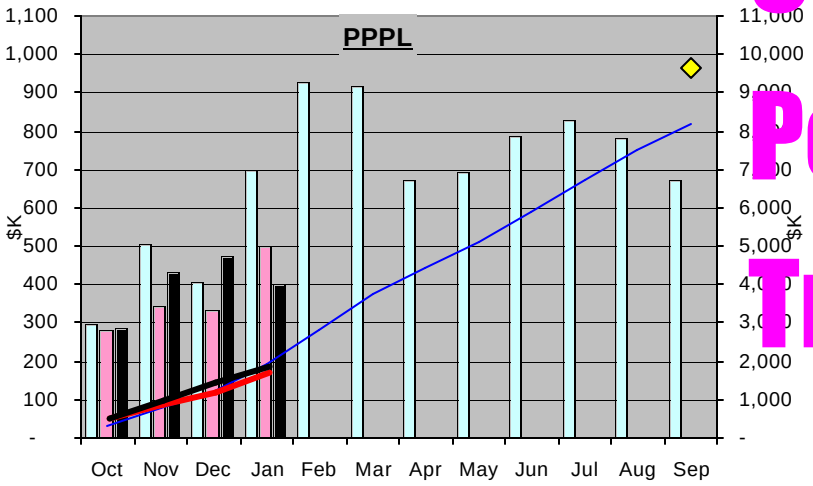
JANUARY FY03

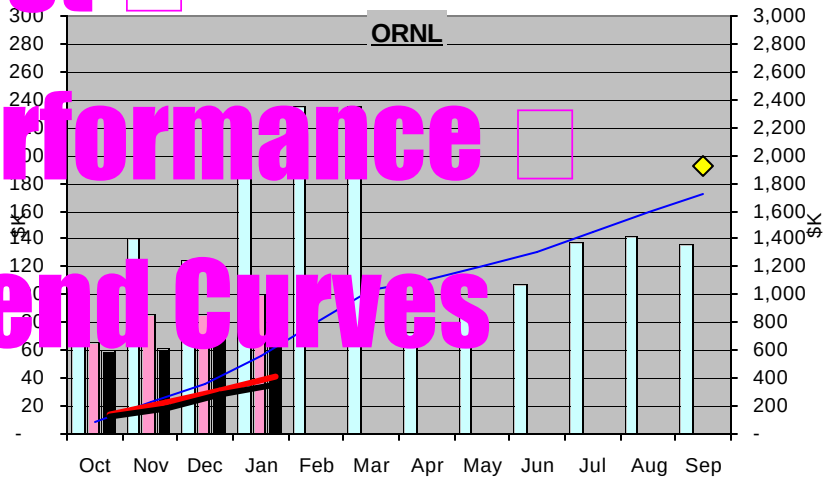
	CURRENT PERIOD			CUMULATIVE TO DATE							FY03		
	Budgeted Cost			Budgeted Cost			VARIANCES				Budget		
	BCWS	BCWP	ACWP	BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI	Baseline	Forecast	Vari
ORNL													
Advanced Conceptual Design													
1 - Stellarator Core Systems	194	82	68	492	266	237	-227	.54	29	1.12	1,516	1,516	
11 In-Vessel Components	0	0		3	0		-2	.17	0		18	18	
1101 - Limiter Advanced Concep Design	0	0		3	0		-2	.17	0		18	18	
1102 - Limiter Prelim & Final Design													
12 Vacuum Vessel Systems	99	28	20	198	95	51	-103	.48	44	1.85	471	471	
1201 - Vacuum Vessel Dsn	85	19	20	159	62	51	-97	.39	10	1.20	323	323	
1202 - Vacuum Vessel R&D	14	8		39	33		-6	.85	33		61	61	
1203 - Vacuum Vessel Final Dsn											87	87	
13 Conventional Coils											13	13	
1301 - Convential Coils Design											13	13	
14 Modular Coils	71	30	31	199	92	115	-106	.47	-23	.80	689	689	
1401 - Mod. Coil Design (casting&winding)	60	25	24	168	72	86	-95	.43	-14	.84	357	357	
1402 - Mod.Coil Analyses	10			10			-10				26	26	
1403 - Mod. Coil Final Design											248	248	
1404 - Mod. Coil Winding Form R&D	1	4	7	21	20	29	1	.95	-9	.69	58	58	
1405 - Mod. Coil Winding R&D Prep													
1406 - Mod. Coil Winding R&D													
1407 - Mod. Coil Winding Facility													
1408 -Mod. Coil Prototype Coil Winding													
15 1501 - Structures Design											13	13	
16 1601 - Coil Services Design													
17 1701 - Cryostat & Base Support Struct Dsn													
18 1801 - Field Period Assembly Design													
19 1901 - Stellarator Core Management&Integr			17	3	78	1	1	1	7	1.11	312	312	
2 - Plasma Heating, Fueling & Vac Systems													
2001 - VPS,Gas & Cond sys Design/Oversigh													
2501 - Neutral Beam Refurbishment													
3 - Diagnostics													
39 3901 - Diagnostics systems Integration													
4 - Electrical Power Systems													
43 4301 - Electrical Dsn DC SystemsWBS 432&													
44 4401 - Electrical Dsn Control & Protection													
45 4501 - Electr System Design & Integration													
46 4601 - FCPC Bldg Modifications													
5 - Central I&C Systems													
58 5801 - Central I&C Integration & Oversight													
6 - Facility Systems													
65 6501 - Facility Systems Integration													
7 - Test Cell Preparation and Machine Assy													
71 7101 - Shield Wall Modifications Design													
74 7401 - TC Prep & Mach Assy Plan&Oversight													
8 - Project Oversight and Support	19	19	9	74	73	49	0	1.00	24	1.50	208	208	
81 Project Management and Control	10	10	9	37	37	48	0	1.00	-11	.78	109	109	
8101 - Project Management and Control													
8102 - NCSX MIE Management ORNL	10	10	9	37	37	48	0	1.00	-11	.78	109	109	
82 Project Engineering													
8202 - Engineering Mgmt & Sys Engr Support													
8203 - Design Integration													
8204 - Systems Analysis													
84 Project Physics	9	9		36	36	1	0	1.00	35	34.24	99	99	
8401 - Project Physcis													
8402 - Project Physics MIE ORNL	9	9		36	36	1	0	1.00	35	34.24	99	99	
Subtotal	213	101	77	566	339	286	-227	.60	53	1.19	1,724	1,724	
Contingency													
Management Reserve											197	197	
TOTAL ORNL											1,921	1,921	
Funding													
Financial Plan BA											1,791	1,791	
January Fin Plan Request											130	130	
Rate Adjustment setaside											n/a	n/a	
											n/a	n/a	
TOTAL ORNL FUNDING											1,921	1,921	

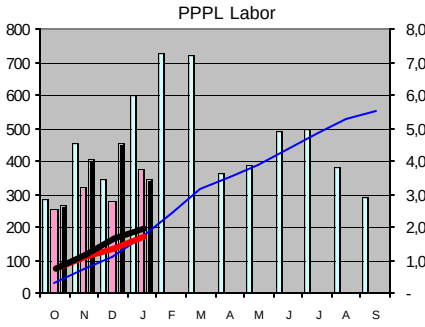
NCSX PPPL/ORNL MIE
FY 2003 Cost Performance

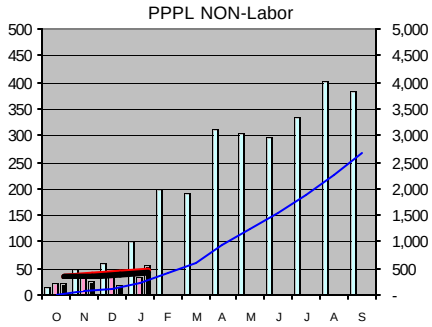


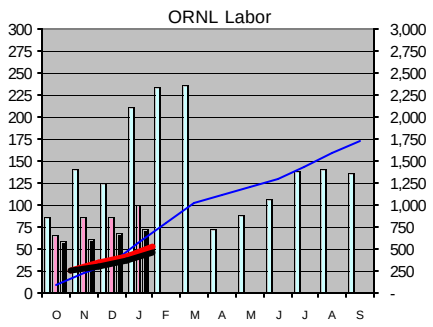
Example "M.5" Cost Performance Trend Curves

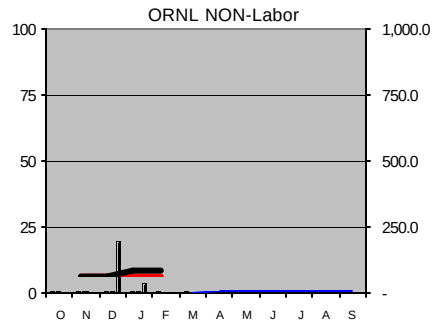












NCSX February 1st Cost Performance Analysis

Example "M.6" Summary Cost Performance Analysis

Vacuum Vessel Design and vendor R&D program

Job 1201 and 1202	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Paul Goranson	232	107	90	-125	0.46	17	1.19

Definition of MC winding geometry and VV shell/FW geometry late; forecast March 3rd completion.
Design of Vac Vsl and interfaces late and forecast by mid May. Critical to June 23rd PDR.

VV prototype award now forecast for 3/24/03 which could delay receipt of MIT, cost and schedule plans. Assuming 8 weeks vendor lead time expected receipt would occur May 19th. THIS WOULD IMPACT THE PDR BY 1 WEEK.

Modular Coil Design, analyses and vendor R&D program

Jobs 1401, 1402 and 1404	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Dave Williamson	334	217	307	-117	0.65	-90	0.71

EM & stress analysis and design tasks late but still supportive of June 23rd PDR.
MCC R&D Vendor award forecast 2/14/03. With 10 week lead time vendor delivery of cost/schedule mit plans by 4/25/03 still supportive of 6/23/03 PDR.
Cost 42% over estimate; driven by PPPL labor in support of MCC procurement efforts.

Modular coil in-house winding R&D activities

1406, and 1407	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Jim Chrzanowski	374	278	261	-96	0.74	17	1.07

Determination of materials properties and allowables only 10% complete. Keystoning task late getting started. Winding of second test coil not yet started.
Selection of epoxy resin system and completion of keystoning test forecast for March.

Stellarator Core Structure, Coil Services,Cryostat,and Field Period Assy Design

Jobs 1501,1601,1701, and 1801	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Feder, William[illegible], Gottlefinger, Chrzanowski	[illegible]	[illegible]	18	-56	0.19	-5	0.72

Updating of co[illegible] conceptual de[illegible] tasks [illegible]ed late.

Stellarator Core Management & Integration

Job 1901	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Brad Nelson	164	78	119	-86	0.48	-41	0.66

Update stella[illegible] 2m[illegible] behin[illegible] A[illegible] design criteria approx 2 mos. behind. Document time constant & req[illegible] behin[illegible] T[illegible] voltage transient field error analysis 1 month behind.

Neutral Beam Refurbishment

Job 2501	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Tim Stevenson	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-22	0.27

Leak detector p[illegible]cure[illegible] (-[illegible]k) [illegible] impact, [illegible]ished.
Late start ramping up on all hardware evaluations and testing. (-35k)

Diagnostics

Job 3901	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Dave Johnson	101	54	80	-47	0.53	-26	0.68

General diagnostic integration, Magnetics integration, SXR Tomography, and Port Orientation issues 1-2 months behind plan.
PPPL researcher charges greater that estimated for work performed.

Electrical systems design and integration

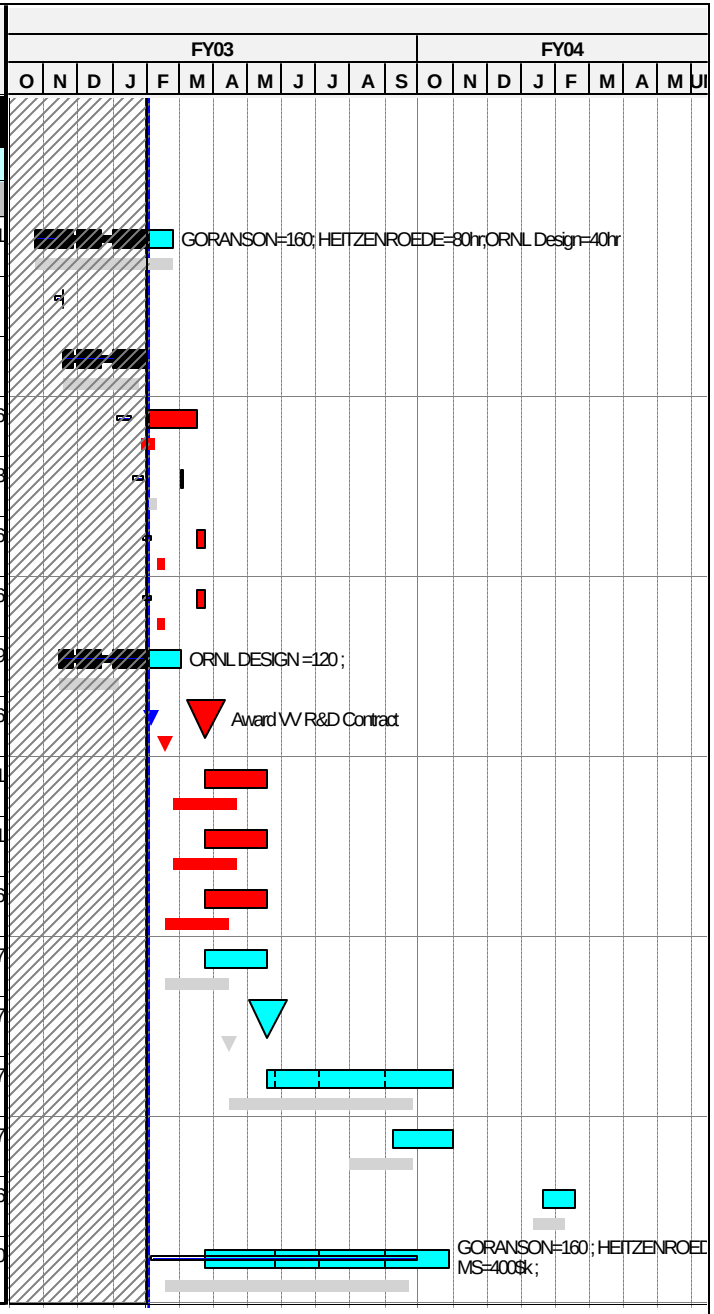
Jobs 4301 and 4501	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Raki Ramakrishnan	39	1	2	-38	0.03	-1	0.50

Only two mandays of work was performed during January. This covered a revisit of the DC transmission line requirements from D to C site. WBS4 needs the final coil configuration details i.e. number of coils and ratings. In addition to the main coils, input is essential regarding the number of trim coils, and their control requirements. Only based on this information WBS4 can commence productive work towards the PDR

Project Engineering	BCWS	BCWP	ACWP	Sched Variance	SPI	Cost Variance	CPI
Jobs 8202, 8203, and 8204	301	238	261	-63	0.79	-23	0.91
Wayne Reiersen							

Plans and procedures as well as development of technical data behind by 2 months. Assessment of sources of field errors 10% complete

Activity ID	Activity Description	Current Start	Current Finish	% Cmplt	Earned value (BCWP)	Baseline Budget	Total Float
Cost Center: 1850 - NCSX Advanced Concep Design							
Work Package: 1*-Stellarator core**							
Job: 1202 - Vacuum Vessel R&D-GORANSON							
121-5-1	Procurement Oversight and Support	24OCT02A	24FEB03	LOE	30,372.82	38,204.80	2,501
121-5-12	Develop and Issue RFP	18NOV02A	18NOV02A	100	0.00	0.00	
121-5-14	[illegible]	[illegible]	29JAN03A	100	0.00	0.00	
121-5-16	[illegible]	[illegible]	17MAR03	-	0.00	0.00	-6
121-5-17	Update Documentation (SOW,spec,dwgs)	03MAR03	04MAR03	-	0.00	0.00	3
121-5-18	[illegible]	[illegible]	[illegible]	-	0.00	0.00	-6
121-5-19	DOE Approval	18MAR03	24MAR03	-	0.00	0.00	-6
121-5-2	Update CAD models, drawings and specifications	15NOV02A	03MAR03	95	12,540.00	13,200.00	9
121-5-25	[illegible]	[illegible]	24MAR03	-	0.00	0.00	-6
L4-076	Report on mfg methods	25MAR03*	19MAY03	-	0.00	0.00	-1
L4-077	[illegible]	[illegible]	[illegible]	-	0.00	0.00	-1
L4-077.1	Budgetary and cost estimates from R&D Vendors	25MAR03	19MAY03	-	0.00	0.00	-6
L4-077.2	MTF and QA plan for VVS	25MAR03	19MAY03	-	0.00	0.00	77
L4-077.3	[illegible]		19MAY03	-	0.00	0.00	77
L4-78	Vendor design/Fab prototype	20MAY03	31OCT03	-	0.00	0.00	77
L4-79	[illegible]	[illegible]	31OCT03	-	0.00	0.00	77
L4-80	Vendors Prep Final plans & firm fixed price est	20JAN04	17FEB04	-	0.00	0.00	76
121-5-3	VV R&D and oversight	25MAR03	28OCT03	LOE	0.00	574,663.50	100

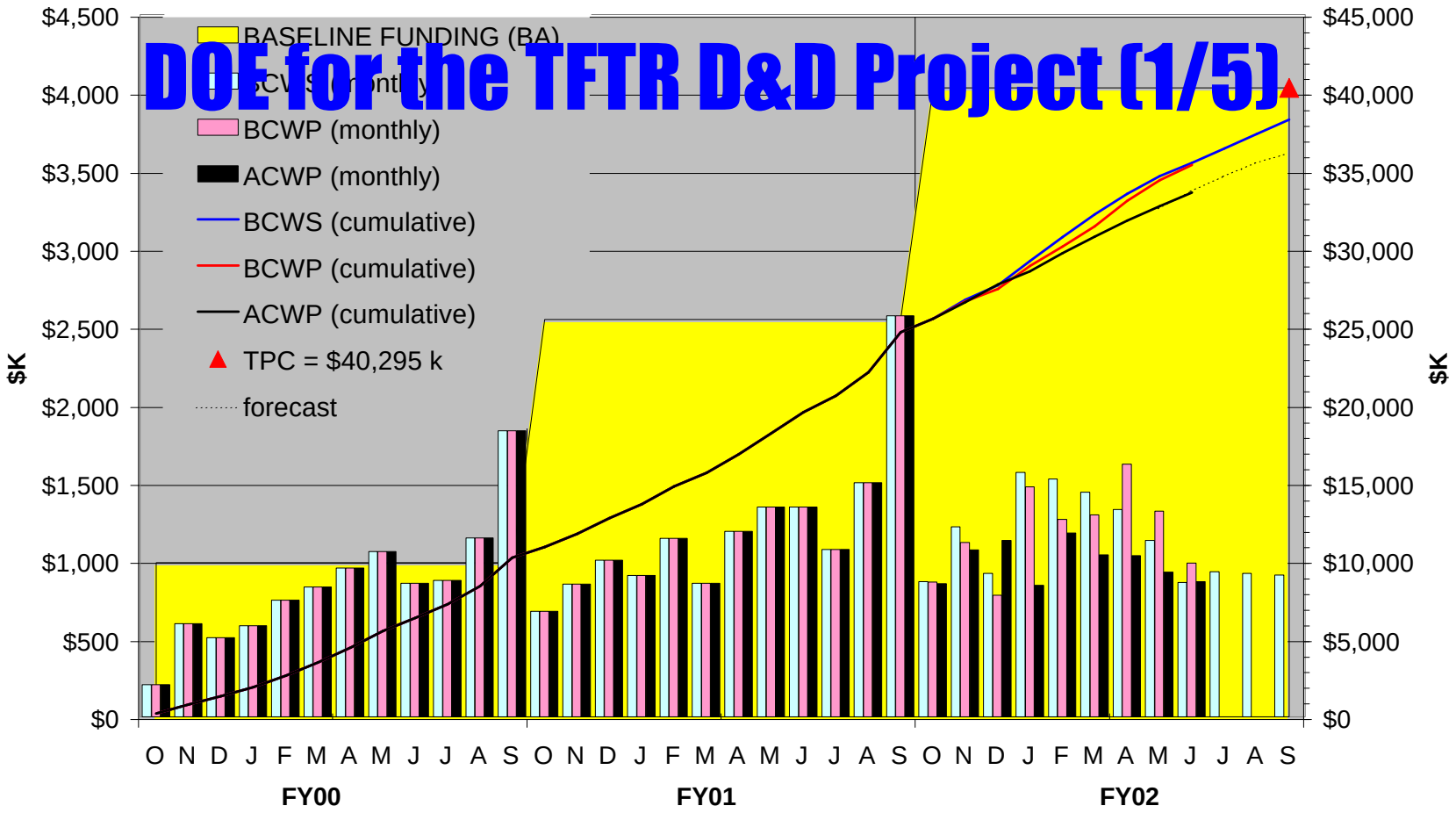


Example "M.7" Current progress and forecast showing critical tasks and comparison to baseline

Run Date 20FEB03 15:46	2/1/03 Status (current) WAF 10/1/02 Baseline Progress Bar Critical Activity	0301	**NCSX** **FY03 Work Authorization Plan**	Sheet 6 of 43 ***STATUS 2/1/03***

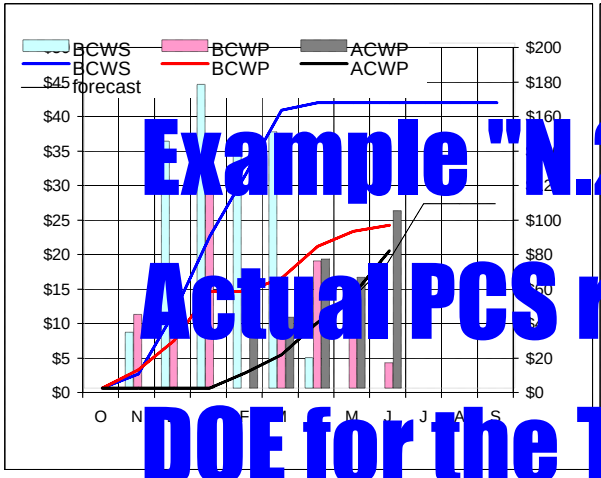
Example "N.1"

Actual PCS report package submitted to DOE for the TFTR D&D Project (1/5)

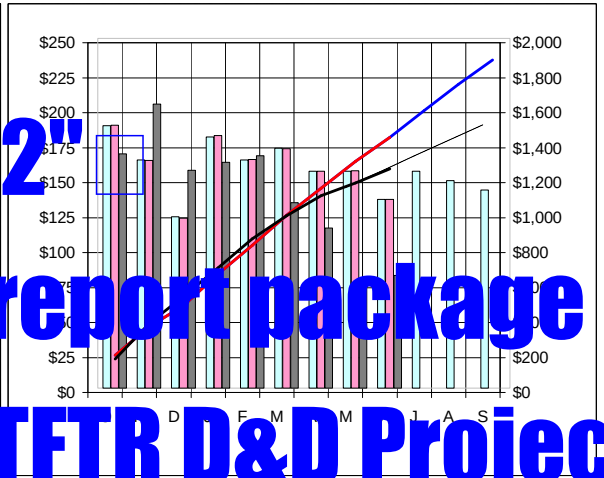


Example "N.2" Actual PCS report package submitted to DOE for the TFTR D&D Project (2/5)

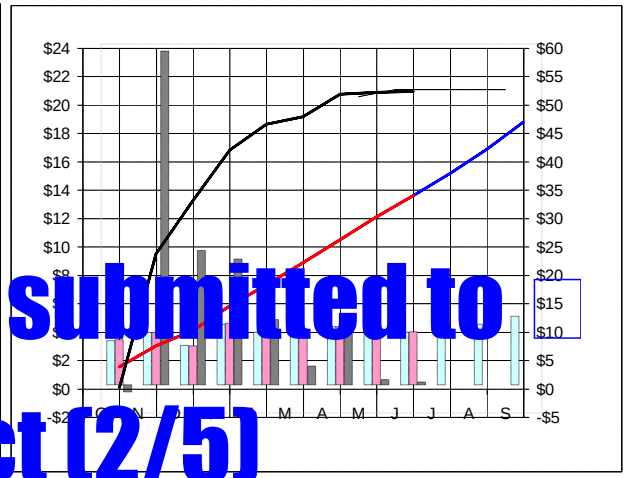
T101 TF Coil Test program



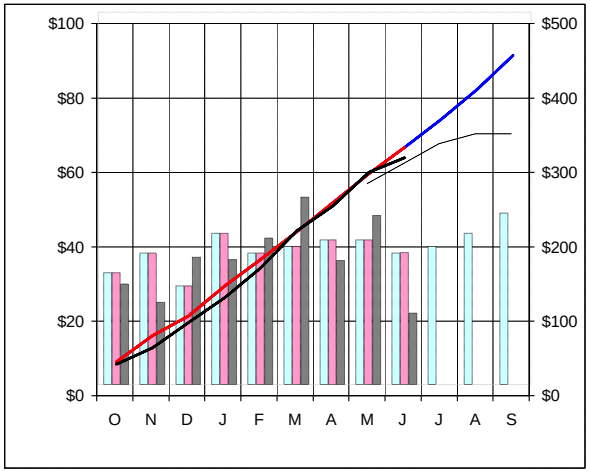
T410 HP Oversight



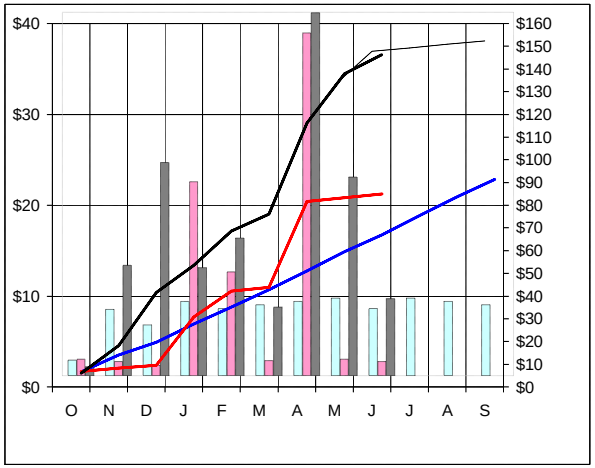
T420 Safety Oversight



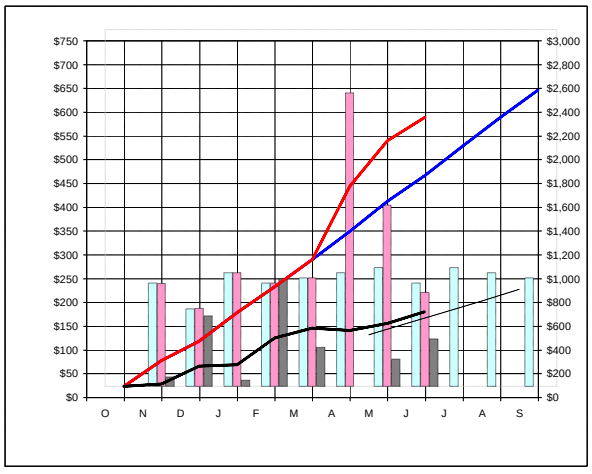
T510 Radwaste Management



T520 Containers & Misc Supplies



T530 Waste Transportation & Disposal



PrincetonUniversity Plasma Physics Laboratory
PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTURE

TFTR D&D

**** Fiscal Year 02 only ****

JUNE FY02

	CURRENT PERIOD			CUMULATIVE TO DATE							AT COMPLETION		
	Budgeted Cost			Budgeted Cost			VARIANCES				Budget		
	BCWS	BCWP	ACWP	BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI	(Dec01 baseline)	Forecast	Variance
WBS 1 Engineering	**82**	**111**	**79**	**1,047**	**938**	**688**	**-109**	**.90**	**249**	**1.36**	**1,332**	**1,001**	**-330**
T100 Mech Engr Oversight & planning	29	29	24	301	301	244	0	1.00	57	1.23	404	261	-142
T101 TF Coil Test program	0	4	26	166	94	80	-71	.57	15	1.18	166	109	-56
T115 Electrical Engr Oversight & Planning	53	78	30	580	542	365	-38	.93	178	1.49	762	631	-132
WBS 2 Field Operations	**393**		**473**	**5,339**	**4,801**	**5,032**	**-539**	**.90**	**-232**	**.95**	**6,183**	**6,569**	**386**
T211 Field Mgt Support Crew	53	53	53	479	479	427	0	1.00	52	1.12	665	553	-112
T212 Field Ops Support Crews	67	67	69	599	599	617	0	1.00	-18	.97	833	677	-156
T213 Equipment, Tools & Rigging	26	22	51	308	301	347	-8	.98	-46	.87	400	506	106
T215 Electrical Removals and Mods	54	58	68	755	594	391	-161	.79	203	1.52	937	908	-29
T220 Vac Vessel Non-Tor Rem	63	141	203	1,611	1,334	1,236	-277	.83	98	1.08	1,656	1,601	-55
T240 Ancillary Removals	10	52	29	237	144	220	-93	.61	-77	.65	342	543	201
T241 DWC & Vessel Fill	0	0	0	1,350	1,350	1,794	0	1.00	-444	.75	1,350	1,782	432
WBS 3 Project Office	**108**	**108**	**104**	**847**	**848**	**832**	**0**	**1.00**	**16**	**1.02**	**1,152**	**1,042**	**-110**
T310 Project Office/T311 EH Safety Follwup	44	45	49	414	414	388	0	1.00	26	1.07	559	443	-115
T320 Work Control & Integ	56	56	47	363	364	316	0	1.00	48	1.15	498	424	-74
T330 Configuration Document Control	8	8	8	70	70	128	0	1.00	-58	.55	95	174	80
WBS 4 HP and Safety	**139**	**139**	**81**	**1,466**	**1,466**	**1,305**	**0**	**1.00**	**160**	**1.12**	**1,924**	**1,584**	**-341**
T410 HP Oversight	135	135	81	1,433	1,433	1,254	0	1.00	179	1.14	1,878	1,531	-347
T420 Safety Oversight	4	4	0	33	33	52	0	1.00	-18	.64	46	53	6
WBS 5 Waste	**2**	**3**	**130**	**2,152**	**2,659**	**1,076**	**507**	**1.24**	**1,583**	**2.47**	**3,018**	**1,415**	**-1,603**
T510 Radwaste Management	35	35	19	318	318	304	0	1.00	14	1.05	442	352	-90
T520 Containers & Misc Supplies	7	2	8	62	80	141	18	1.29	-61	.57	86	152	66
T530 Waste Transportation & Disposal	217	197	99	1,772	2,260	628	489	1.28	1,633	3.60	2,489	910	-1,579
T540 Hazardous Waste	0	0	3	0	0	3	0	.00	-3	.00	0	0	0
Subtotal	**[illegible]**	**[illegible]**	**867**	**10,852**	**10,711**	**8,934**	**-141**	**.99**	**1,776**	**1.20**	**13,608**	**11,611**	**-1,997**
CONTINGENCY											**2,039**	**0**	**-2,039**
Management Reserve											**0**	**631**	**631**
TOTAL											**15,647**	**12,242**	**-3,406**
Engineering (JOBS T100, T101& T115)	82	111	79	1,047	938	688	-109	**0.90**	249	**1.36**	1,332	1,001	
Field (JOBS T215, T220,T240, & T241)	126	252	300	3,953	3,422	3,641	-531	**0.87**	-219	**0.94**	4,285	4,834	
LOE (JOBS T211,T212,T3xx,T4xx,T510)	401	401	327	3,710	3,710	3,486	0	**1.00**	224	**1.06**	5,015	4,206	
	610	764	706	8,710	8,070	7,816	-640	**0.93**	254	**1.03**	10,632	10,041	

PrincetonUniversity Plasma Physics Laboratory
PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTURE

TFTR D&D

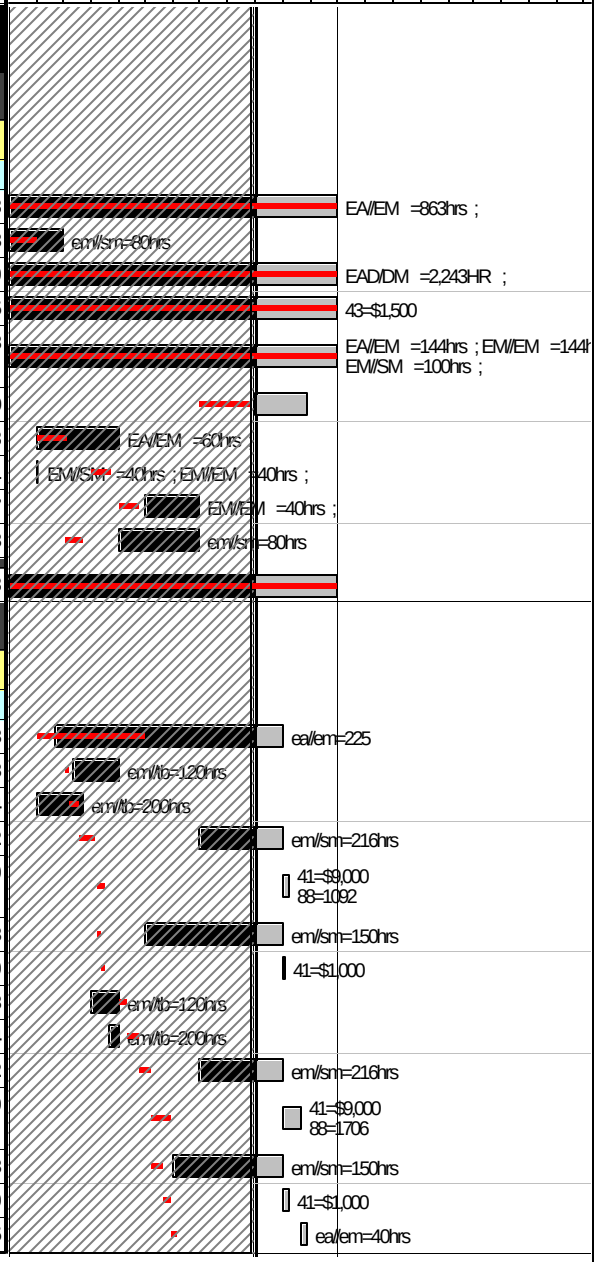
TOTAL PROJECT (FY00-FY02)

JUNE FY02

	CURRENT PERIOD			CUMULATIVE TO DATE							AT COMPLETION		
	Budgeted Cost			Budgeted Cost			VARIANCES				Budget	Current	
	BCWS	BCWP	ACWP	BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI	(Dec01 baseline)	Forecast	Variance
WBS 1 Engineering	**82**	**111**	**79**	**4,991**	**4,882**	**4,632**	**-109**	**.98**	**249**	**1.05**	**5,275**	**4,945**	**-330**
T100 Mech Engr Oversight & planning	29	29	24	3,019	3,019	2,962	0	1.00	57	1.02	3,122	2,979	-142
T101 TF Coil Test program	0	4	26	166	94	80	-71	.57	15	.00	166	109	-56
T115 Electrical Engr Oversight & Planning	53	78	30	1,806	1,768	1,591	-38	.98	178	1.11	1,988	1,857	-132
WBS 2 Field Operations	**273**	**393**	**473**	**18,873**	**18,335**	**18,567**	**-539**	**.97**	**-232**	**.99**	**19,717**	**20,103**	**386**
T211 Field Ops Suprvision	53	53	53	1,294	1,294	1,243	0	1.00	52	1.04	1,480	1,368	-112
T212 Field Ops Support Crews	67	67	69	2,083	2,083	2,101	0	1.00	-18	.99	2,316	2,160	-156
T213 Support Tools & Rigging	26	22	51	3,158	3,150	3,196	-8	1.00	-46	.99	3,250	3,356	106
T214 Design & Development Support	0	0	0	163	163	163	0	1.00	0	1.00	163	163	0
T215 Electrical Removals and Mods	54	58	68	1,323	1,162	959	-161	.88	203	1.21	1,505	1,476	-29
T220/T222 Non-Tokamak Removals	63	141	203	3,137	2,860	2,762	-277	.91	98	1.04	3,181	3,127	-55
T230 Bio-Shield Enhancement Upgrade	0	0	0	487	487	487	0	1.00	0	1.00	487	487	0
T240 Tokamak Removals	10	52	29	2,501	2,408	2,484	-93	.96	-77	.97	2,607	2,807	201
T241 DWC & Vessel Fill	0	0	0	4,727	4,727	5,171	0	1.00	-444	.91	4,727	5,159	432
WBS 3 Project Office	**108**	**108**	**104**	**3,133**	**3,133**	**3,118**	**0**	**1.00**	**16**	**1.00**	**3,437**	**3,328**	**-110**
T310 Project Office/T311 EH Safety Followup	44	45	49	1,512	1,512	1,486	0	1.00	26	1.02	1,657	1,541	-115
T320 Work Control	56	56	47	1,337	1,337	1,289	0	1.00	48	1.04	1,471	1,397	-74
T330 Configuration Control	8	8	8	285	285	343	0	1.00	-58	.83	309	389	80
WBS 4 HP and Safety	**139**	**139**	**81**	**4,462**	**4,462**	**4,302**	**0**	**1.00**	**160**	**1.04**	**4,920**	**4,580**	**-341**
T410 HP Oversight	135	135	81	4,184	4,184	4,005	0	1.00	179	1.04	4,629	4,282	-347
T420 Safety Oversight	4	4	0	278	278	297	0	1.00	-18	.94	291	298	6
WBS 5 RCT Support	**[illegible]**	**234**	**130**	**4,040**	**3,989**	**2,964**	**-51**	**.99**	**1,025**	**1.35**	**4,906**	**3,302**	**-1,603**
T510 RCT Waste Management	35	35	19	838	838	824	0	1.00	14	1.02	962	871	-90
T520 Containers & Misc Supplies	7	2	8	539	0	619	-539	.00	-619	.00	564	630	66
T530 Waste Transportation & Disposal	217	197	99	2,655	3,144	1,511	489	1.18	1,633	2.08	3,373	1,794	-1,579
T540 Mixed Waste	0	0	3	7	7	10	0	1.00	-3	.73	7	7	0
SUBTOTAL	**[illegible]**	**985**	**867**	**35,500**	**34,801**	**33,582**	**-698**	**.98**	**1,219**	**1.04**	**38,256**	**36,258**	**-1,997**
CONTINGENCY											**2,039**	**0**	**-2,039**
Management Reserve											**0**	**631**	**631**
TOTAL PROJECT											**40,295**	**36,889**	**-3,406**

	PLAN	ACTUAL	
Design % complete	**94.6%**	**92.5%**	*(WBS 1)*
Construction % complete	**97.2%**	**92.8%**	*(JOBS T215, T220, T240 & T241)*
Total % complete	**92.8%**	**91.0%**	

Activity ID	Activity Description	Forecast Start	Forecast Finish	Baseline Finish	% CmpIt	Earned value (BCWP)	Budget
1395 - TFTR D&D PROJECT							
T100 - D&D Engr Planning&Oversight J.CHRZANOWSKI							
1.1.1 - GENERAL PLANNING							
A-1037	Engineering Oversite FY02 (1 EA)	01OCT01A	30SEP02	30SEP02	LOE	*86,294*	**119,853**
ADD-1000	Procedure for TC/TCB wall penetrations	01OCT01A	30NOV01A	01NOV01	100	*7,108*	**7,108**
M-1013	Processing ECN's and drawings for FY02	01OCT01A	30SEP02	30SEP02	LOE	*141,228*	**196,150**
M-1015	Misc small purchases for FY02	01OCT01A	30SEP02	30SEP02	LOE	*1,415*	**1,965**
M-1021	Mechanical Engr. SupportFY02	01OCT01A	30SEP02	30SEP02	LOE	*35,019*	**48,638**
M-1045	procedure removing/replacing HEPA Filters (FED)	01JUL02*	27AUG02	26JUN02		*0*	**0**
M-1269	Procedure f/ removing the ISS	01NOV01A	31JAN02A	03DEC01	100	*8,333*	**8,333**
M-1293	plan procedure for shot blasting TC floor	01NOV01A	01NOV01A	21JAN02	N/R	*9,041*	**9,041**
M-1297	Procedure f/ final decon of Test Cell and TCB	01MAR02A	30APR02A	21FEB02	100	*5,487*	**5,487**
M-1298	Procedure f/ 102' penetration clearing & sealing	01FEB02A	30APR02A	21DEC01	100	*7,108*	**7,108**
Subtotal		01OCT01A	30SEP02	30SEP02		*301,033*	**403,683**
T101 - TF Coil Test Prog[illegible]							
Change Notification #6							
TF Coil Test Program							
CN402-001	Engineering Oversight and report [illegible]eration	01[illegible]01A	31JUL02	27FEB02	LOE	*27,373*	**31,248**
CN402-003	Diassemble Coil 3	12D[illegible]01A	[illegible]	[illegible]01	100	*7,028*	**7,028**
CN402-004	Cut coil and case samples coil 3	01NOV01A	21DEC[illegible]A	17DEC01	100	*11,714*	**11,714**
CN402-005	Prepare samples for outside lab testing coil 3	01MAY02A	31JUL02	04JAN02	25	*4,798*	**19,192**
CN402-007	Outside Lab Perform Tests coil 3	01AUG02	08AUG02	14JAN02		*0*	**11,790**
CN402-009	Prepare samples for PPPL testing [illegible]3	[illegible]	[illegible]	[illegible]		*9,996*	**13,328**
CN402-011	PPPL Test Samples coil 3	01AUG02*	02AUG02	14JAN02		*0*	**1,310**
CN402-103	Diassemble Coil 18	01JAN02A	31JAN02A	07FEB02	100	*7,028*	**7,028**
CN402-104	Cut coil and case samples coil 18	1[illegible]JA[illegible]2	[illegible]AN02A	21FE[illegible]02	100	*11,714*	**11,714**
CN402-105	Prepare samples for outside lab t[illegible]ing 18	01MA[illegible]2	[illegible]L02	07MA[illegible]02	25	*4,798*	**19,192**
CN402-107	Outside Lab Perform Tests coil 18	01AUG02	21AUG02	28MAR02		*0*	**11,790**
CN402-109	Prepare samples for PPPL testing [illegible]18	01APR02A	3[illegible]JU[illegible]02	[illegible]	75	*9,996*	**13,328**
CN402-111	PPPL Test Samples coil 18	[illegible]UG02	[illegible]UG02	28MA[illegible]02		*0*	**1,310**
CN402-200	Prepare Report	22AUG02	28AUG02	04APR02		*0*	**5,555**



Example "N.5"

Actual PCS report package submitted to DOE for the TFTR D&D Project (5/5)

Data Date	01JUL02	**D218**	**TFTR D&D STATUS 7/1/2002**
Run Date	25FEB03 12:44		Sheet 1 of 12

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Princeton University Plasma Physics Laboratory Controllers Office
Budget System Rates Base Year FY03 Printed: 02/21/03

	FY03 KD/Hr	FY04 KD/Hr	FY05 KD/Hr
DIRECT OVERTIME	.04300	.04300	.04300
TECH CTR OVERTIME	.04300	.04300	.04300

The above rates are valid in the PMS 82 cards only.

PAGE

Princeton University Plasma Physics Laboratory Controllers Office
Budget System Rates Base Year FY03 Printed: 02/21/03

	Dv	A SfO	Staff Name		FY03 KD/FTE	FY03 KD/MTH	FY03 DOLL/HR	Hours per/Yr	Tc Prod Time %	Revised YY-MM-DD
PPPL Tech Centers										
EA MECHANICAL ENG	EA	CB	SEC/CLER	BI-WKLY	57.276	4.7730	33.1765	1726.4	.8300	02-12-09
	EA	DM	DRAFTING	MONTHLY	89.375	7.4480	51.7699	1726.4	.8300	02-12-09
	EA	DS	DRAFTING	SUB-CTR	113.967	9.4973	54.7920	2080.0	1.0000	02-12-09
	EA	EM	ENGR/SCI	MONTHLY	136.514	11.3762	79.0745	1726.4	.8300	02-12-09
	EA	TH	LAB+SHOP	HOURLY	34.476	2.8730	16.5750	2080.0	1.0000	03-01-07
	EA	THB	LAB+SHOP	HOURLY	26.299	2.1916	12.6437	2080.0	1.0000	02-12-09
EC COMP SYS DIV	EC	AM	ADMIN	MONTHLY	109.263	9.1052	63.2895	1726.4	.8300	02-12-09
	EC	EH	ENGR/SCI	HOURLY	114.920	9.5767	55.2500	2080.0	1.0000	02-12-09
	EC	EM	ENGR/SCI	MONTHLY	126.807	10.5672	73.4517	1726.4	.8300	02-12-09
	EC	SM	SR LAB	MONTHLY	75.866	6.3222	43.9448	1726.4	.8300	02-12-09
	EC	TB	LAB+SHOP	BI-WKLY	60.501	5.0417	35.0446	1726.4	.8300	02-12-09
	EC	TH	LAB+SHOP	HOURLY	36.774	3.0645	17.6800	2080.0	1.0000	02-12-09
EE ELECTRICAL ENG	EE	AM	ADMIN	MONTHLY	71.595	5.9662	41.4707	1726.4	.8300	02-12-09
	EE	EM	ENGR/SCI	MONTHLY	133.867	11.1556	77.5410	1726.4	.8300	02-12-09
	EE	SM	SR LAB	MONTHLY	95.414	7.9512	55.2679	1726.4	.8300	02-12-09
	EE	TB	LAB+SHOP	BI-WKLY	67.278	5.6065	38.9700	1726.4	.8300	02-12-09
	EE	TH	LAB+SHOP	HOURLY	34.476	2.8730	16.5750	2080.0	1.0000	03-01-13
EM FAB,OPS &MAINT	EM	EC	ENGR/SCI	CONTRACT	228.800	19.0667	*******	2080.0	1.0000	02-12-09
	EM	EH	ENGR/SCI	HOURLY	78.146	6.5121	37.5700	2080.0	1.0000	02-12-09

Example "0" Average PPPL Labor Rates by skill. Used for both budgeting and costing.

1 PAGE 1

Budget System Cost Center Allocation Map
Year 03 Printed: 02/21/03

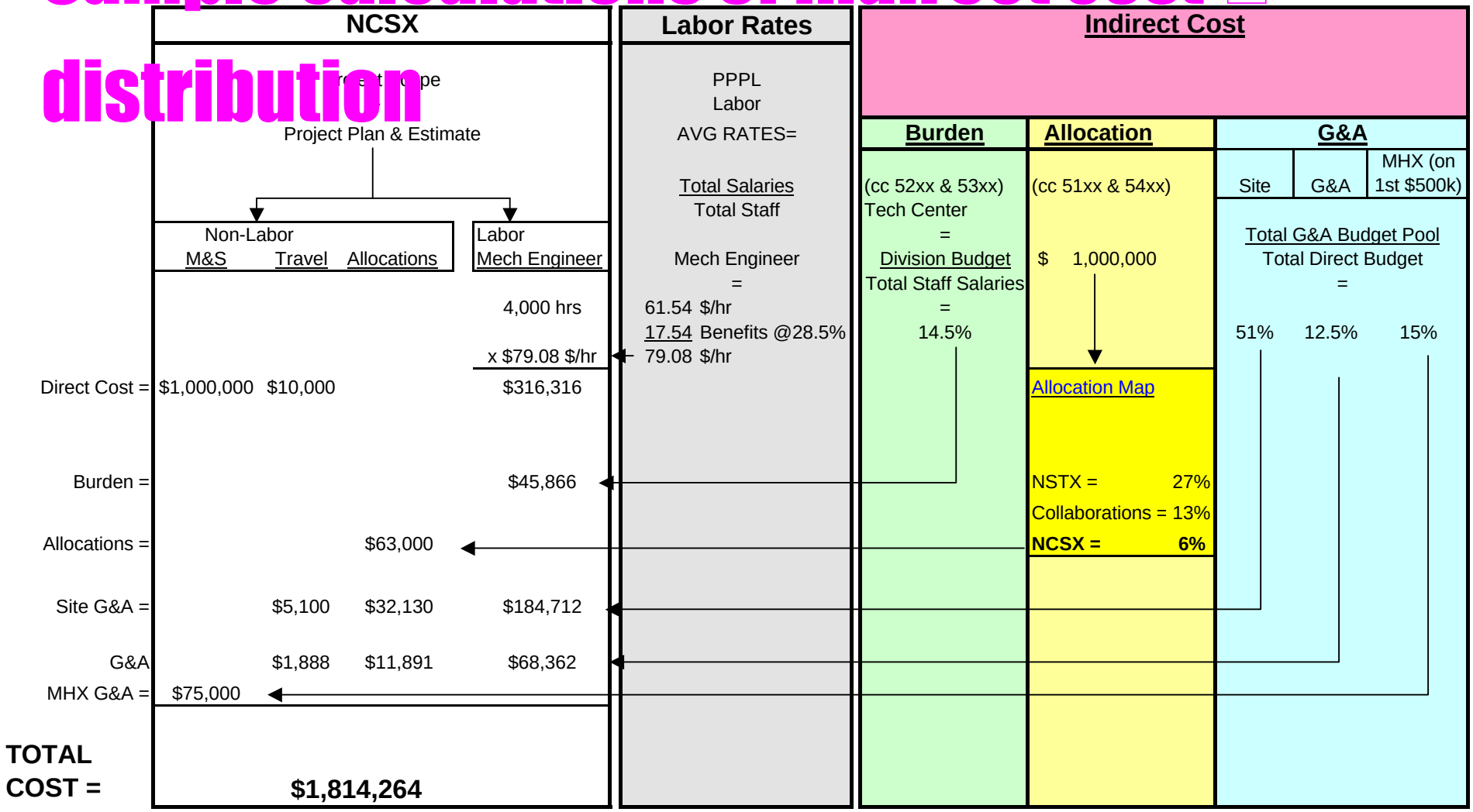
```
|---------    |--- ALLOCATE TO --|    |--- ALLOCATE TO --|    |--- ALLOCATE TO --|
|CC  WKPG     |CC  WKPG JOB   PCT|    |CC  WKPG JOB   PCT|    |CC  WKPG JOB   PCT|
-------------------------------------------------------------------------------

5111 ****     1030 ---- *NUL  .149   1205 ---- *NUL  .066   1215 ---- *NUL  .042
1220 ---- *NUL  .028   1313 ---- *NUL  .147   1815 ---- *NUL  .051
2110 ---- *NUL  .038   2130 ---- *NUL  .130   4501 ---- *NUL  .144
4502 ---- *NUL  .056   4503 ---- *NUL  .043   7336 ---- *NUL  .016
7530 ---- *NUL  .011   7534 ---- *NUL  .030   7549 ---- *NUL  .049
Total Allocation Percent:    1.000

5141 ****     5322 ---- *NUL  .200   5323 ---- *NUL  .350   5325 ---- *NUL  .3
5326 ---- *NUL  .140   .                   .   .                   .
Total Allocation Percent:    1.000

5408 ****     1030 ---- *NUL  .280   1220 ---- *NUL  .100   2110 ---- *NUL  .0
2130 ---- *NUL  .420   7530 ---- *NUL  .100   .                   .
Total Allocation Percent:    1.000

5424 ****     1020 ---- C300  .062   1020 ---- C310  .010   1020 ---- C350  .010
1022 ---- *NUL  .007   1030 ---- *NUL  .010   1050 ---- C100  .079
1052 ---- C130  .001   1060 ---- C200  .052   1080 ---- *NUL  .004
1081 ---- *NUL  .004   1083 ---- *NUL  .004   1135 ---- *NUL  .134
1136 ---- *NUL  .131   1150 ---- *NUL  .003   1205 ---- *NUL  .005
1210 ---- *NUL  .002   1215 ---- *NUL  .005   1220 ---- *NUL  .002
1313 ---- *NUL  .021   1808 8*** 8181  .016   1809 ---- *NUL  .007
1812 ---- *NUL  .010   1815 ---- *NUL  .004   1850 8*** 8998  .06
2003 ---- *NUL  .006   2102 ---- *NUL  .004   2104 ---- *NUL  .014
2110 ---- *NUL  .003   2130 ---- *NUL  .011   3104 ---- *NUL  .075
3107 ---- *NUL  .061   3120 ---- *NUL  .011   3130 ---- *NUL  .047
3132 ---- *NUL  .011   3141 ---- *NUL  .009   3142 ---- *NUL  .004
4501 ---- *NUL  .030   4502 ---- *NUL  .006   4503 ---- *NUL  .004
6351 ---- *NUL  .027   7301 ---- *NUL  .005   7302 ---- *NUL  .008
7303 ---- *NUL  .001   7335 ---- *NUL  .017   .                   .
Total Allocation Percent:    1.000
```

Example "Q" Allocation map used by PPPL to distribute budget and cost for directly allocated work

Example "P"

Sample calculations of indirect cost distribution

PPPL COST ACCOUNTING OVERVIEW



Princeton University Plasma Physics Laboratory Controllers Office
Bfa:JAN Closing CurMth:01 CurFYr:03 Frozen:02/01/03 00:12:09
report BFADTL (Dollars) Printed:02/04/03 09.43.26

	Annual Budget	Cur Month Expend	Yr-to-date Budget	Yr-to-date Expend	Cur Year Encumb	Cur Year Reqs	Balance Remaining
CstCtr:1850 NCSX ADVANCED CONCEP							
1100 DIRECT LABOR & BENEFITS	16,100	2,445	5,367	7,441	14,053	0	-5,394
1200 RESEARCH LABOR & BENEFITS	451,200	26,067	150,400	143,972	0	0	307,228
1400 PF&A DIVISION LABOR & BENIFITS	191,800	13,726	63,933	69,578	0	0	122,222
2200 COMPUTER SYS DIV LABOR & BENEF	12,700	0	4,233	0	0	0	12,700
2300 FAB,OPS & MAINT DIV LAB & BENS	932,200	44,043	310,733	163,130	0	0	769,070
2500 ELECTRICAL DIV LABOR & BENS	207,000	7,042	69,000	27,364	0	0	179,636
2600 MECHANICAL DIV LABOR & BENS	1,392,600	79,829	464,200	359,759	0	0	1,032,841
2700 TECH CENTER SCL	0	1,035	0	3,855	0	0	-3,855
3000 DIRECT OVERTIME & BENEFITS	0	0	0	203	0	0	-203
3100 TECH CENTER OVERTIME & BENEFIT	0	4,945	0	10,981	0	0	-10,981
3500 TRAVEL	18,500	2,352	6,167	4,832	0	0	13,668
3700 STOCKROOM WITHDRAWALS	1,500	1,106	500	2,781	0	0	-1,281
3800 CREDIT CARD EXPENDITURES MISC	0	0	0	182	0	0	-182
3900 OTHER EXPENSE	0	145	0	431	0	0	-431
4100 MATERIALS & SERVICES	2,115,100	32,926	705,033	48,434	8,000	1,402,691	655,975
4300 CREDIT CARD EXPENDITURES VARIO	0	6,299	0	12,973	0	0	-12,973
4800 OH EXEMPT PORTION OF S/CS	522,400	0	174,133	0	0	200,000	322,400
5200 RESEARCH BURDEN	31,584	1,825	10,528	10,078	0	0	21,506
5300 TECH CENTER BURDEN	325,595	17,633	108,531	73,917	0	0	251,678
5400 DIRECT ALLOCATIONS	65,811	4,428	21,937	20,603	0	1,668	43,540
6200 ONSITE G&A	2,496,886	140,777	832,295	613,984	9,626	1,142	1,872,134
6400 MHX G&A	677,312	12,906	225,771	20,540	2,560	448,861	205,350
6500 ICO G&A	167,168	0	55,723	0	0	64,000	103,168
8100 COST TRANSFERS	-30,000	0	-10,000	0	0	0	-30,000
*TOTAL CstCtr:1850	9,595,415	399,528	3,198,485	1,595,039	34,239	2,118,362	5,847,815

Example "R"

Typical PPPL accounting report.

JOB	1406 - Mod. Coil Winding R&D-CHRZANOWSKI							
Sum of Hours			Month					
TASK ID	TASK DESCR	NAME	10/1/2002	11/1/2002	12/1/2002	1/1/2003	2/1/2003	3/1/2003
141-1-5	Oversee s/c test and write report	ZATZ				5	91	64
141-2-1	Develop VPI mold & impregnation techniques	CHRZANOWSKI	19	16	13	18	17	18
		KEARNS	95	79	62	91	83	87
		MACHINIST	165	137	108	158	144	151
		MEIGHAN	38	32	25	37	33	35
141-2-1.01	CTD consultant	SC			8	11	10	11
141-2-2	Receive inspect and VPI test	[illegible]			19			
		[illegible]			19			
		KEARNS		61	19			
		MEIGHAN		76	24			
141-2-3	Perform conductor Keystone tests	CHRZANOWSKI				27	49	24
		[illegible]				7	14	7
		[illegible]				7	14	7
		MEIGHAN				77	140	70
		RAFTOPOULOS				21	39	20
141-2-4	Perform VPI and winding testing	CHRZANOWSKI				7	29	30
		[illegible]				[illegible]	64	109
		[illegible]				[illegible]	[illegible]	163
		MEIGHAN				31	124	130
141-2-5	Develop winding and VPI procedures for prototype	CHRZANOWSKI						
141-QPS-1	Wind 2nd Test Coil @ PPPL	CHRZANOWSKI				8		
		[illegible]				[illegible]		
		[illegible]				[illegible]		
141-QPS-2	VPI 2nd Test Coil	GIFFORD				24		
		KEARNS				24		
		MEIGHAN				8		
141-QPS-3	Wind (4) conductor Coil	[illegible]					16	
		[illegible]					40	
		KEARNS					40	
141-QPS-4	VPI (4) Conductor Coil	GIFFORD					24	
		KEARNS					24	
		MEIGHAN					8	
Grand Total			317	523	297	846	1451	1052

Example "S.1" Typical labor loading report generated from the PCS. Task/manpower laoding for select job.

NAME	ORNL DESIGN							
Sum of Hours			Month					
JOB	TASK ID	TASK DESCR	Oct	Nov	Dec	Jan	Feb	Mar
1101 - Limiter Adv Cor	111-2-1	Interface control documents for vacuum vessel				2	19	20
1201 - Vacuum Vessel	121-1-02	Update Conceptual Design of Vac Vsl		106	86			
	121-1-1	CAD models and drawings of vessel dsn			10	115	105	58
	121-2-1	Interface control documents for in-vessel compon					4	11
	121-2-2	Interface control document for modular coil syst					6	17
	121-2-3	Interface control document for auxillary systems					6	17
	121-2-5	Interface control document for utilities					6	17
	122-1-1	Specify insulation an[illegible]ttachment			2	20	18	
	122-1-2	Interface and cost da[illegible]			2	20	18	
	123-1-1	Schematics and CA[illegible]			2	20	18	
	123-1-3	Interface and cost data input			1	14	13	13
	124-1-1	CAD models and assembly drawings of support syst			4	40	36	
	124-1-4	Interface and cost data input			0	5	5	5
	125-1-1	Sensor specification a[illegible]						
1202 - Vacuum Vessel	121-5-1	De[illegible]velop Documentation [illegible]						
	121-5-2	Upda[illegible]te CAD models [illegible]						
1203 - Vacuum Vessel	121-6-1	CAD models and drawings of vessel final design						
1401 - Mod Coil Dsn -	140-2-1	Interface control documents for vacuum vessel in					8	8
	140-2-2	Interface control document for support structure						12
	140-2-3	Interface control doc[illegible]						12
	140-2-5	Interface control doc[illegible]						12
	140-5-1	CAD models of modular coils design		102	96	140	128	134
	140-5-2	CAD drawings of all major parts and assemblies			6	140	127	127
	140-5-3	design review documentation PDR Prep						
	140-5-4	Procure STL models [illegible]						
	143-1-1	Sensor specification [illegible]						
1403 - Mod. Coil Final D	140-6-1	CAD models of mod[illegible]						
	140-6-2	CAD drawings of all parts subassemblies interf						
	140-6-3	Final design review documentation prep						
Grand Total			15	267	257	614	594	471

Example "S.2" Typical labor loading report generated from the PCS. Job/task laoding for select name or resource skill.

Sum of Hours	Month												
NAME	10/1/2002	11/1/2002	12/1/2002	1/1/2003	2/1/2003	3/1/2003	4/1/2003	5/1/2003	6/1/2003	7/1/2003	8/1/2003	9/1/2003	Grand Total
JUN			2	46	42	29		23	35	37	35	30	279
AKERS	24	21	20	24	21	22	23	23	22	24	22	22	268
BENSON	16	14	15	16	14	14	15	15	14	16	14	14	177
BERRY	12	10	8	11	10	11	11	11	11	11	11	11	128
BISESTI		20	16	83	81	85	86	70	54	55	22	22	594
BLANCHARD						40							40
BROOKS	63	153	141	181	175	97	151	145	145	151	145	145	1692
BROWN	82	66	53	79	70	74	79	74	74	79	74	74	878
BUSH		29	23	33	53	53	25	24	24	25	1		290
CAMP				96									96
CARSON	1	16	24	37	63	64	89	114	100	84	47	47	686
CHRZANOWSKI	75	206	136	163	211	229	97	55	160	147	138	52	1669
COLE	115	139	109	159	145	150	35	34	129	135	129	66	1345
DAHLGREN	31	25	11	130	119	101		18	20	21	20	20	516
DUDEK	40	48	49	70	64	53	55	53	53	55	53	53	646
FAN	137	113	7	163	128	60		147	240	334	358	122	1809
FEDER	40	48	44	73	134	249	81	72	121	222	63	77	1224
FEDOVERHEAD	0	0	0	0	0	0	0	0	0	0	0	0	0
FENSTERMACH	7	6	5	7	6	7	7	7	7	7	7	7	80
FIELD TECHS					91	152	46						289
FIELDTECHTB		61	19										80
FOM ENGR					3	7	3						13
FOM TECHS T		346	294	431	517	477	138	131	131	138	6		2609
FREDRICKSON	33	42	46	33	29	30	32	30	30	32	30	30	397
GETTLEFINGE		46	34	55	104	249	43		113	121	138	15	918
GIBILISCO	7	15	12	18	46	47	61	83	83	65	30	30	497
GIFFORD				167	308	179	114	109	109	5			991
GORANSON	15	93	106	393	387	335	94	87	81	84	109	93	1877
GROSSMAN SC	3	2	2	3	3	3	3	3	3	3	3	3	34
HAMPTON	77	64	51	73	67	71	73	71	71	73	71	71	833
HBUSH					41	39							80
HEITZENROED	116	88	30	16	50	54	57	54	108	87	72	228	960
HUDSON	41	34	27	40	36	38	40	38	38	40	38	38	448
JOHNSON	25	5	6	8	4	7	7	16	6	16	7	0	383
JONES	44		114	1	6	2			24	24	24	8	842
KALISH	17	9		1	7	9	65	70	166	204	202	133	1441
KEARNS	95	140	81	271	43	320	171	163	163	8			1855
KU	95	78	62	90	83	86	90	86	86	90	86	86	1018
KUGEL	25	20	16	24	21	22	24	22	22	24	22	22	264
LAZARUS	72	65	64	71	62	66	69	68	66	71	66	27	767
LYON	48			17	4	46		44			4	4	
MACHINIST	165	3	3	2	4	45	6	1	73	1			5
MAJESKI	25		1	2	3	2	4	1	23	3	2	3	
MARSALA					12	13	14	13	13	14	1		
MECH DESIGN		10	8	70	170	330	93	71	176	206	110	22	1266
MEIGHAN	38	124	61	171	322	252	154	147	134	6			1409
MIKKELSEN	17	14	11	16	14	15	16	15	15	16	15	15	179
MIODUSZEWSK	25		16	8	2	3					3		7
MORRIS	32	9	8	2	104	2		1	3	1	30	4	
NBI TECH	12	5	0	5	6	1	1	3	3	5	1	1	82
NEILSON	149	128	97	143	130	137	143	137	137	143	137	137	1613
NELSON	101	84	64	50	151	159	107	74	71	75	103	199	1238
NEUMEYER				101	91	59	21		14	14	23	5	328
OLIARO		15	12	17	15	16	17	16	16	17	16	16	173
OWEN	17	4	1	1	1	6	1	15	6	1	1	1	79
PARSELLS						54	6	7	2		1	1	30
PAUL	168	4	7	1	8	8	1	1	1	1	1	1	361
PERRY		32	25	37	34	35	37	35	35	37	35	35	377
POMPHREY	41	34	27	40	36	38	40	38	38	40	38	38	448
PROVOST				56	51	53							160
RAFTOPOULOS	31	147	116	165	190	165	25	24	24	25	1		913
RAKI		7	5	61	100	50	47	41	39	40	7	7	404
REIERSEN	179	148	138	169	89	94	99	94	94	99	94	94	1391
REIMAN	33	27	22	32	29	30	32	30	30	32	30	30	357
ROSSI								5	20	16			41
RUSHINSKI		72	57	91	230	110	18	126	165	201	204	48	1322
SC			8	25	50	53	154	152	152	176	244	228	1242
SCHMIDT	49	41	32	48	43	46	48	46	46	48	46	46	539
SCHNEIDER					12	13	14	13	13	14	1		80
SIMMONS	185	154	110	126	78	82	86	82	82	86	82	82	1235
SPONG	25	20	16	24	22	23	24	23	23	24	23	23	270
STEVENSON		16	12	18	18	18	18	18	18	18	18	18	190
STOCKROOM		0	0	0	0	0	0	0	0	0	0	0	0
STRATTON	17	70	84	30	37	31	27	14	13	22	7	0	352
STRYKOWSKY	82	68	53	78	71	75	78	75	75	78	75	75	883
TAKAHASHI		14	16	47	61	22		79	76	38			353
VANKIRK		20	16	100	122	90	86	70	54	55	22	22	657
WILLIAMSON	190	267	215	215	316	444	115	118	154	167	171	259	2631
YAGER					30	30	30	30	30	30	30	30	240
ZARNSTORFF	112	91	72	107	96	102	107	102	102	107	102	102	1202
ZATZ		48	40	106	260	296	22	56	74	77	74	66	1119
ORNL DESIGN	15	267	257	614	594	471	38	226	228	453	435	305	3903
Grand Total	3064	4991	3953	6939	8270	8120	3956	4239	5048	5217	4325	3583	61705

Example "S.3"

Typical labor loading report generated from the PCS.

Summary loading by name.

Activity ID	DSNR	Early Start	Work Days	Early Finish	Total Float
12 - Vacuum Vessel Systems					
+ Period #1					
		23MAR04	235	14FEB05	82
+ Period #2					
		08FEB05	95	20JUN05	82
+ Period #3					
		14JUN05	95	24OCT05	82
14 - Modular Coils					
Job: 1401 - Mod Coil Dsn -WILLIAMSON					
140-1-1		22JAN03*	26*	26FEB03	47
140-5-11		22JAN03*	18*	14FEB03	10
142-9-0	MC	27JAN03*	5	31JAN03	0
142-9-1	MC	03FEB03*	55	18APR03	0
142-9-2	MC		0	18APR03	0
142-9-3	MC	21APR03	15	09MAY03	0
L4-093		22JAN03*	5	28JAN03	10
L4-094		03FEB03*	5	07FEB03	45
L4-098		29JAN03*	10	11FEB03	10
140-5-12		12FEB03*	13	28FEB03	10
L4-097		24FEB03*	15	14MAR03	10
140-2-1		17FEB03*	30*	28MAR03	30
L4-091.1		10MAR03*	15	28MAR03	15
L4-092		10MAR03*	5	14MAR03	15
L4-095		17MAR03*	5	21MAR03	15
L4-105		17FEB03*	5	21FEB03	55
L4-096		24MAR03*	5	28MAR03	30
L4-106		24FEB03*	5	28FEB03	50
L4-107		17MAR03*	5	21MAR03	35
140-2-3		17FEB03*	30*	28MAR03	30
140-5-2		24MAR03*	20	18APR03	20
L4-108		03MAR03*	10	14MAR03	40
L4-109		24MAR03*	5	28MAR03	30
L4-110		24FEB03*	5	28FEB03	50
140-1-01		21OCT02A	56*	20DEC02A	
140-1-02		16DEC02A	20*	22JAN03	37
140-1-2		05MAY03*	10*	16MAY03	25
140-3-1		21APR03*	20*	16MAY03	20
140-5-3	MC	12MAY03*	30	23JUN03	0
140-5-4		23JAN03	17*	14FEB03	60
140-PDR	MC		0	23JUN03*	0
143-1-1		14APR03*	5*	18APR03	20
L4-004		23JAN03*	10	05FEB03	37
L4-012		23JAN03*	15	12FEB03	2,453
L4-014		20JAN03*	10	31JAN03	2,461
L4-015		13FEB03	16	06MAR03	2,453
L4-100		24MAR03*	20	18APR03	15
L4-102		21APR03*	25	23MAY03	15
Job: 1402 - Mod.Coil Analyses-WILLIAMSON					
140-4-01		01OCT02A	67*	13DEC02A	
140-4-2		16DEC02A	37*	14FEB03	56
L4-160		27JAN03*	10	07FEB03	41
140-4-1		22JAN03*	18*	14FEB03	39
L4-155		10FEB03*	15	28FEB03	16
L4-156		03MAR03*	5*	07MAR03	16
140-4-3		03MAR03*	28*	09APR03	16
140-4-4		17MAR03*	25*	18APR03	16
L4-159		21APR03*	15*	09MAY03	16
L4-159.1		12MAY03*	14*	30MAY03	16
Job: 1403 - Mod. Coil Final Design-WILLIAMSON					
140-1-3		24JUN03*	55*	10SEP03	180
140-3-5		11AUG03*	20*	08SEP03	182
140-4-5		24JUN03*	66*	25SEP03	169
140-6-1		24JUN03*	49*	02SEP03	186
140-6-2		01JUL03*	61*	25SEP03	169
140-6-3	MC	10OCT03	30	20NOV03	159
140-6-3.1	MC		0	20NOV03	159
140-6-4	MC	21NOV03	20	18DEC03	159
Job:1404-Mod Coil Winding Form R&D-HEITZENR					
142-1-05		01OCT02A	0*	18OCT02A	
142-1-06		21OCT02A	38	16DEC02A	
142-1-07	MC	17DEC02A	16*	17JAN03	13
142-1-08	MC	20JAN03	5	24JAN03	13
142-1-1	MC	17DEC02A	16*	17JAN03	18
142-1-10	MC	02JAN03	22	31JAN03	8
142-1-15	MC		0	31JAN03*	8
142-1-2A	MC	03FEB03*	62	29APR03	8
142-1-2B	MC	03FEB03*	62	29APR03	8
142-10.1	MC	03FEB03	31	17MAR03	9
142-1-2AP	MC	04FEB03*	45	07APR03	159
142-1-2BP	MC	04FEB03*	45	07APR03	159
142-1-30	MC		0	07APR03	159
142-1-3A	MC	08APR03*	130	09OCT03	159
142-1-3B	MC	08APR03*	130	09OCT03	159
C-061	MC		0	09OCT03	159
142-1-4A	MC	19DEC03*	20	15JAN04	159
142-1-4B	MC	19DEC03*	20	15JAN04	159
C-071	MC	16JAN04	20	12FEB04	159
C-081	MC	13FEB04	0		159
C-082	MC	13FEB04	0		159
C-083	MC	01OCT04*	0		221
Job: 1405-Mod Coil Winding R&D Prep-CHRZANO					
141-1-1		01OCT02A	80*	03FEB03	271
L4-141		02JAN03*	10*	15JAN03	284
L4-142		03FEB03	1	03FEB03	271
141-1-2		28OCT02A	149*	06JUN03	2,428
141-1-2.1		02DEC02A	23*	13JAN03	286
141-1-3		28OCT02A	99*	27MAR03	291
L4-139		18NOV02A	20	17DEC02A	
L4-140		18NOV02A	20	17DEC02A	
L4-146		18DEC02A	35*	14FEB03	272
L4-149.1		02JAN03*	42*	28FEB03	252
L4-152		28APR03	18	21MAY03	252
Job: 1406 - Mod. Coil Winding R&D-CHRZANOWS					
141-2-1		01OCT02A	120*	31MAR03	280
L4-129		04NOV02A	1	27NOV02A	
L4-130		02DEC02A	1	20DEC02A	
L4-131		02DEC02A	1	20DEC02A	
L4-132		19NOV02A	44*	31JAN03	215
L4-133		02DEC02A	10	17DEC02A	
L4-134		18DEC02A	5	20DEC02A	
141-1-3.1			0	24FEB03	267
141-2-1.01		02DEC02A	91*	17APR03	267
L4-119		16DEC02A	5	20DEC02A	
L4-121		02JAN03	10*	15JAN03	273
L4-122		24JAN03*	11*	07FEB03	267
L4-123		10FEB03*	11*	24FEB03	267
L4-124		02JAN03*	17*	24JAN03	288
L4-125		25FEB03*	20*	24MAR03	267
L4-126		25MAR03*	4*	28MAR03	267
L4-127		31MAR03*	14*	17APR03	267
141-2-1.1			0	31JAN03*	277
141-2-3		03FEB03*	16*	24FEB03	305
L4-113		02DEC02A	10	16DEC02A	
L4-114		17DEC02A	18*	21JAN03	313
L4-116		03FEB03*	16*	24FEB03	304
L4-117		25FEB03	1	25FEB03	304
141-2-3.1			0	25FEB03	304
141-2-2		28OCT02A	46*	20DEC02A	
141-2-2.1			0	20DEC02A	
141-2-4		03FEB03*	106*	01JUL03	215
141-2-4.1			0	31MAR03	2,476
L4-143		04FEB03	5	10FEB03	271
L4-144		11FEB03*	5*	17FEB03	271
L4-145		18FEB03	5	24FEB03	271
L4-146.1		18FEB03	15	10MAR03	271
L4-147		11MAR03	10	24MAR03	271
L4-148		25MAR03	5	31MAR03	271
L4-149.2		03MAR03*	20	28MAR03	252
L4-150		31MAR03*	10	11APR03	252
L4-151		14APR03	10	25APR03	252
L4-177		22MAY03	10	05JUN03	252
L4-178		28JUL03*	15	15AUG03	217
L4-179		18AUG03	10	29AUG03	217
141-2-5		02JUL03*	44*	03SEP03	215
141-2-5.1			0	03SEP03*	215
L4-115		02JAN03*	17*	24JAN03	309
141-QPS-1		06JAN03*	6	13JAN03	2,515
141-QPS-2		20JAN03*	5	24JAN03	2,511
141-QPS-3		03FEB03*	6	10FEB03	2,506
141-QPS-4		17FEB03*	5	21FEB03	2,502
Job: 1407 -Mod Coil Winding Facility-CHRZANOW					
141-3-1		01NOV02A	95*	27MAR03	303
L4-170		09DEC02A	52*	28FEB03	322
L4-171		09DEC02A	52*	28FEB03	322

Example "T" Critical path schedule showing tasks and linkages. This plot shows tthe Vacuum Vessel and Modlar Coil integrated schedule.