



# US ATLAS Project Management

**J. Shank**



**U.S. ATLAS Computing and Physics meeting**

**27-29 Aug., 2003**

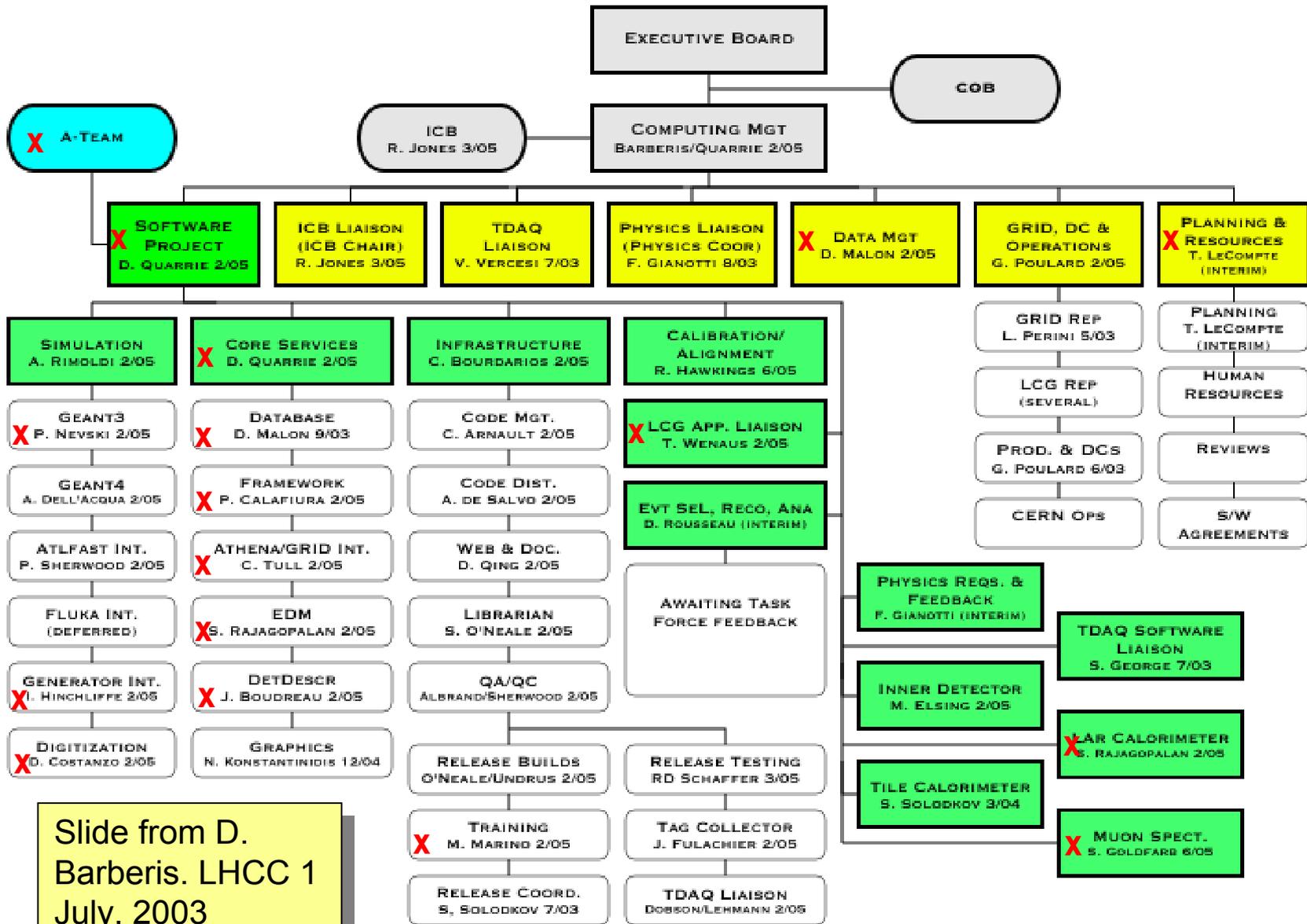
**BNL**

# Outline/Charge

These are mostly my slides I showed at the DOE/NSF review of LHC Computing held at NSF 8 July, 2003

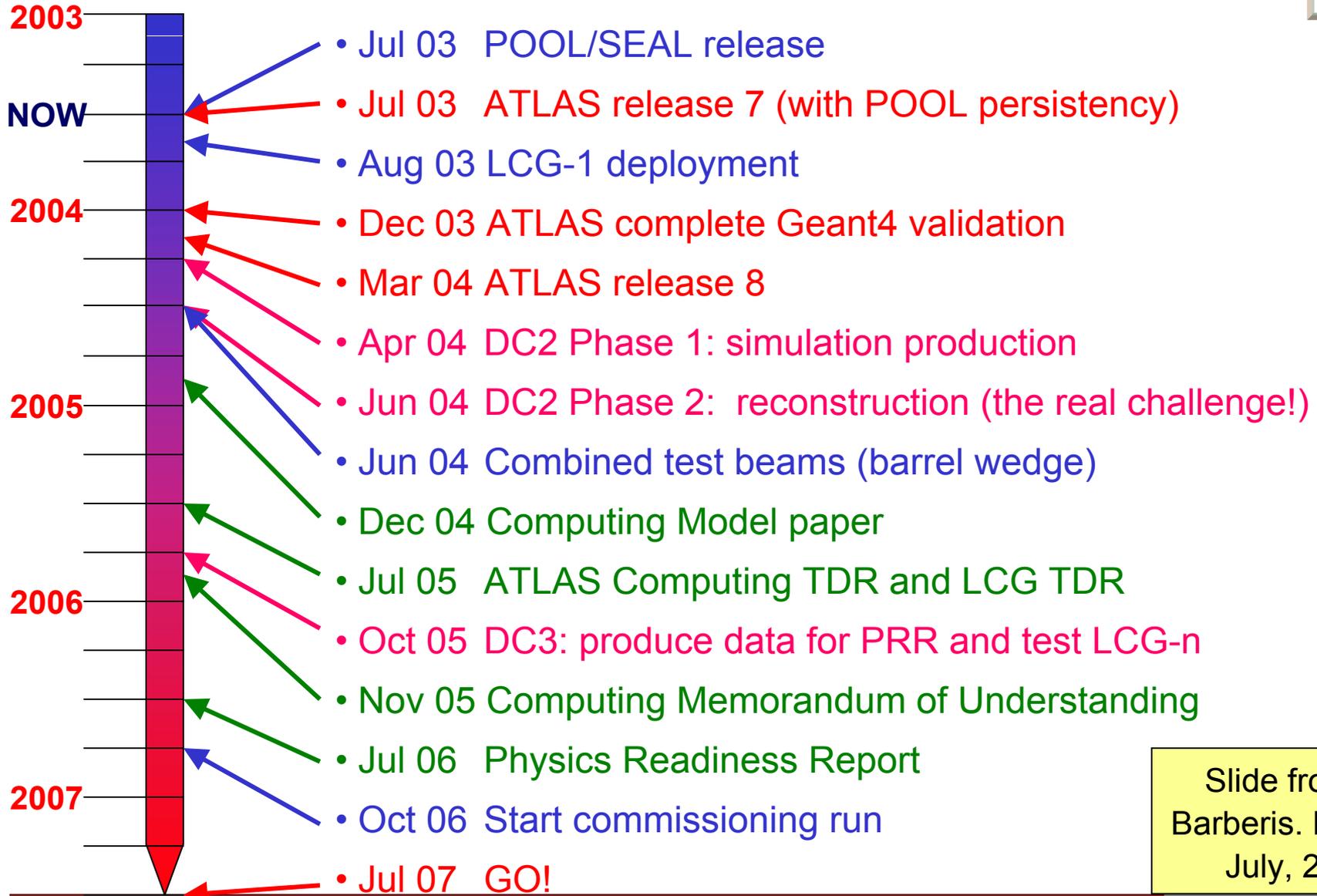
- **International ATLAS organization**
  - Org. Chart, Time Line, DC plans, LCG software integration
- **US ATLAS organization**
  - Project management plan for the Research Program
  - WBS and MS Project scheduling
- **Procedure for determining Computing/M&O budget split**
- **FY03 Budget**
- **FY04 Budget**
- **Regular US ATLAS Computing meetings**

# New ATLAS Computing Organization



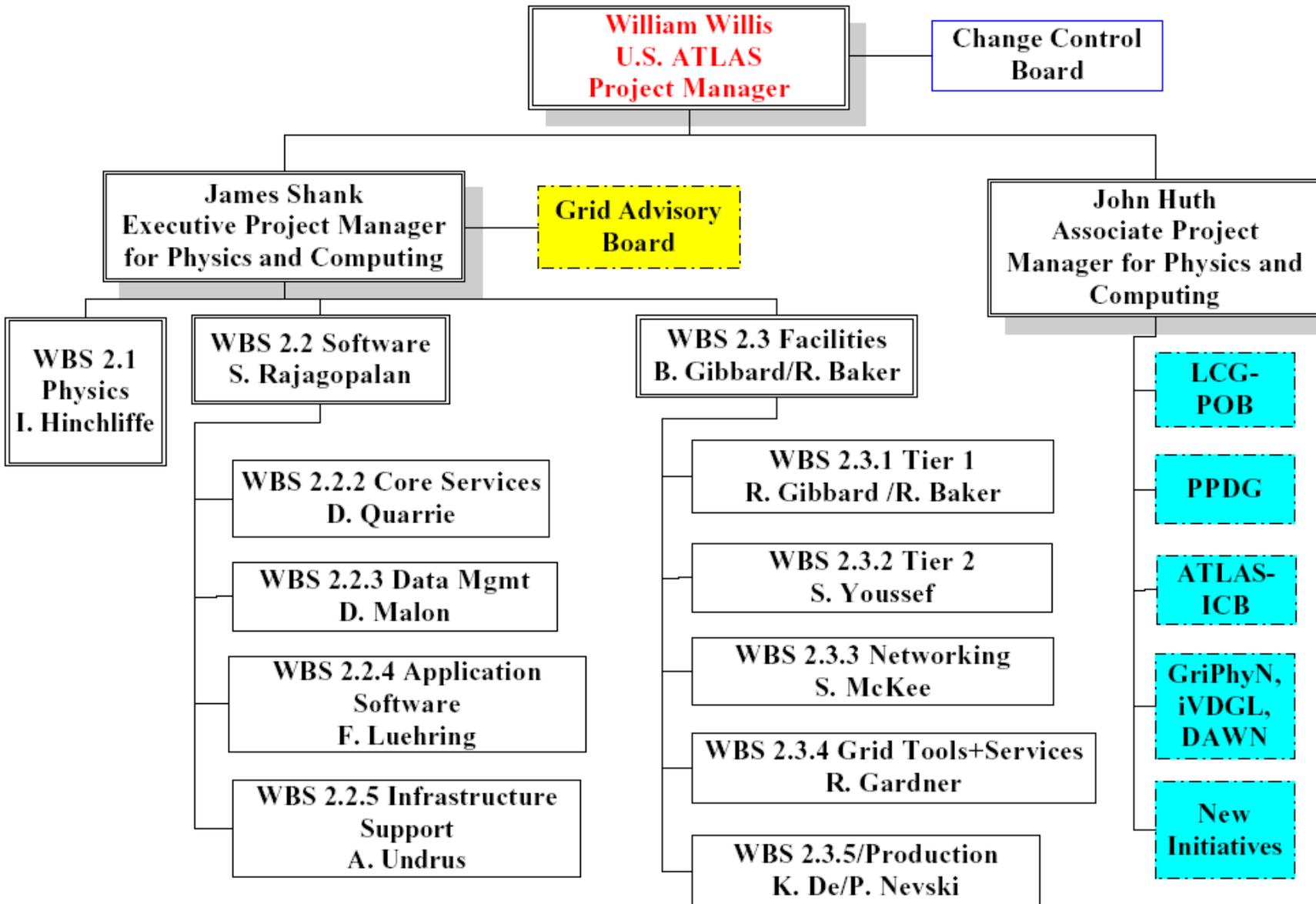
Slide from D. Barberis. LHCC 1 July, 2003

# ATLAS Computing Timeline



Slide from D. Barberis. LHCC 1 July, 2003

# US ATLAS Computing Organization Chart



# US ATLAS Computing Management Plan



- Existing document from Nov., 2001
  - Includes Tier-2 selection process (timescale has slipped)
- Being rewritten now to take into account new structure and Research Program
  - Main change: relative roles of Shank/Huth
    - In broad brush-strokes:
      - Shank: day-to-day management of the computing plan
        - Budget allocation for project funded people
        - Work plan for all computing activities
      - Huth: deals with issues broader than just US ATLAS
        - NSF Large ITR: DAWN
        - Grid projects: PPDG, GriPhyN, iVDGL
        - LCG (POB)
        - ICB (ATLAS International Computing Board)
  - This new organization with Shank/Huth is working well.

# US ALTAS Computing planning



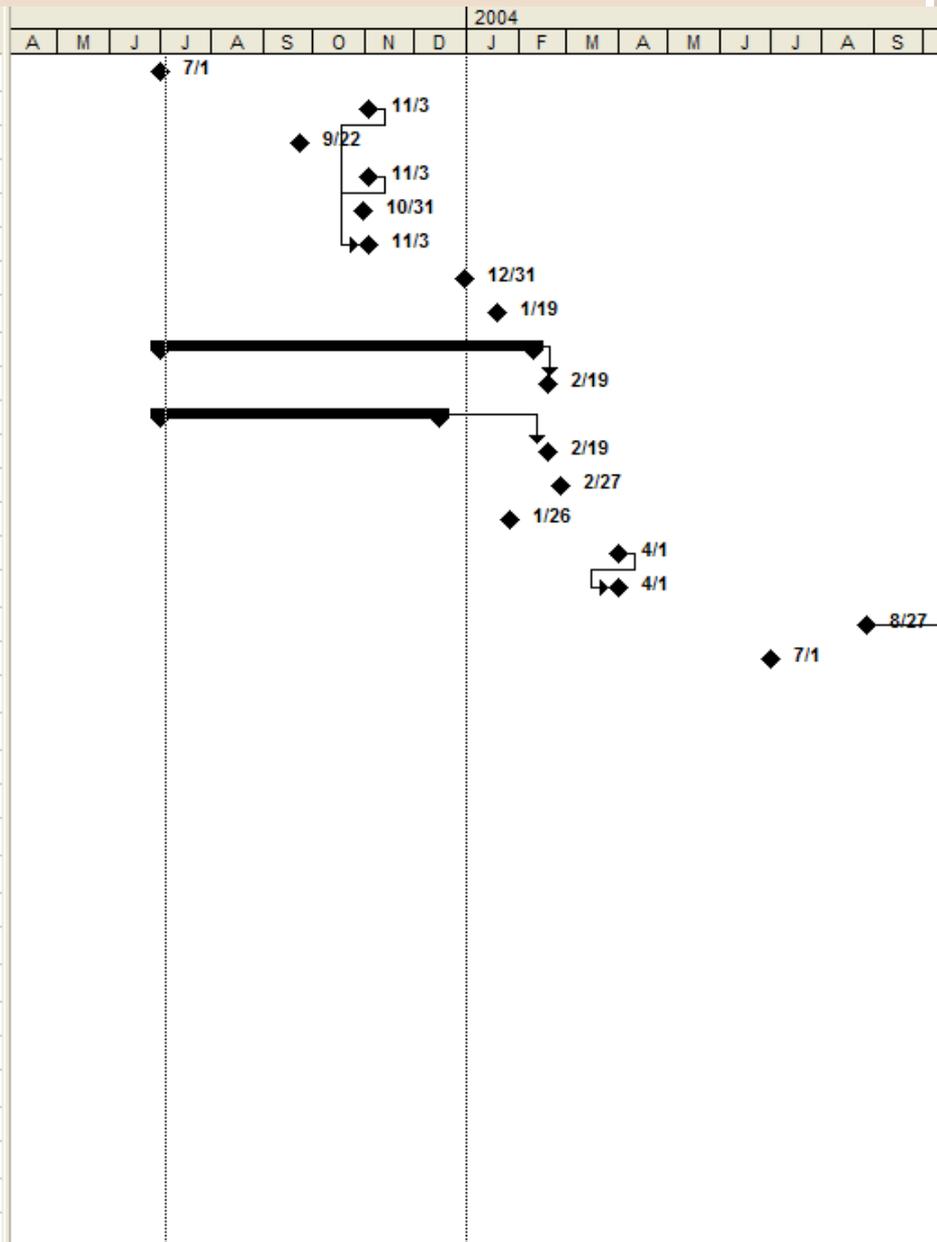
- Complete scrubbing of the WBS from January review is in progress.
- Series of WBS scrubbing meetings culminating on 6/6/03
  - Participants: Level 3 managers and above
  - Concentrated on project funded resources
    - This part is done and is reflected in talks today.
    - More work needed on base and other funded resources.
  - More work needed on integration with ATLAS planning
    - Working with new ATLAS planning officer.
- ATLAS planning will be complete in Sept. manpower review



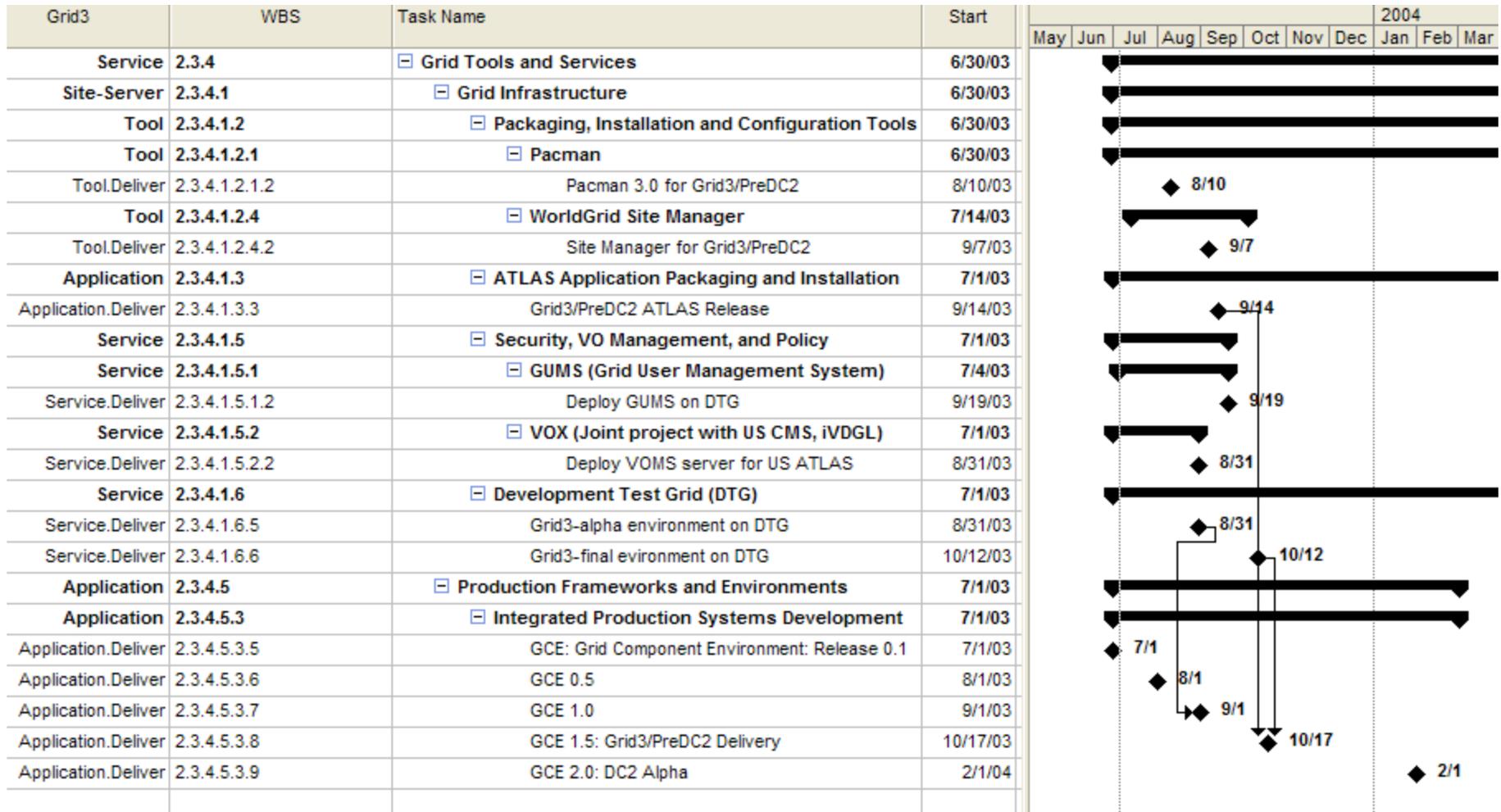
# MS Project Facilities Milestones



Task Name	Duration	Start
<b>LCG-1 pilot initial operation begins</b>	0 wks	7/1/03
DC1 production complete	0 wks	11/3/03
Grid3 GTS version delivered	0 wks	9/22/03
Grid3 GTS version ready for production	0 wks	11/3/03
Alpha version host network diagnostics deployed	0 wks	10/31/03
Grid 3 production operations begin	0 wks	11/3/03
Grid 3 Goals Achieved	0 wks	12/31/03
<b>LCG-1 Full Services Available</b>	0 wks	1/19/04
<b>Evolve Tier 1 Fabric for DC2</b>	32 wks	7/1/03
Tier 1 Fabric upgrade fully operational for DC2	0 wks	2/19/04
<b>Evolve Tier 2 Fabric for DC2</b>	24 wks	7/1/03
Tier 2 Fabric upgrade fully operational for DC2	0 wks	2/19/04
Beta version host network diagnostics deployed	0 wks	2/27/04
DC2 GTS version delivered	0 wks	1/26/04
DC2 GTS version ready for production	0 wks	4/1/04
<b>Start ATLAS DC2</b>	0 wks	4/1/04
DC2 Goals Achieved	0 wks	8/27/04
Permenant Tier 2 Sites A & B selection complete	0 wks	7/1/04
<b>Computing Model Document Complete</b>	0 wks	1/3/05
<b>LCG-3 Full Service Available</b>	0 wks	1/17/05
Permenant Tier 2 Sites C & D selection complete	0 wks	5/2/05
Tier 1 Fabric upgrade fully operational for DC3	0 wks	7/1/05
<b>Start ATLAS DC3</b>	0 wks	7/1/05
<b>LCG Computing TDR</b>	0 wks	7/1/05
Tier 1 Fabric upgrade fully operational for DC4	0 wks	11/1/05
<b>Start ATLAS DC4</b>	0 wks	11/1/05
<b>Computing MOU signed</b>	0 wks	1/2/06
Permenant Tier 2 Sites E selection complete	0 wks	1/16/06
Tier 1 Fabric full operation at 15% capacity	0 wks	10/2/06
<b>Start Full Chain Test in Real Environmen</b>	0 wks	10/2/06
Tier 1 Fabric full operation at 30% capacity	0 wks	5/1/07
<b>LHC Startup</b>	0 wks	5/1/07
Tier 1 Fabric full operation at 100% capacity	0 wks	7/1/08
<b>100% Capacity for LHC</b>	0 wks	7/1/08



# Grid3/GTS Milestones



# Software MS Project



ID	WBS	Task Name	Start	Finish	2003				2004				2005							
					Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4				
1	<b>2.2</b>	<b>Software</b>	<b>Tue 10/1/02</b>	<b>Sat 7/30/05</b>	[Gantt bar spanning from Q4 2003 to Q1 2005]															
2	<b>LCG M.</b>	POOL/SEAL Prototype Release	Wed 7/30/03	Wed 7/30/03	[Milestone: 7/30]															
3	<b>LCG M.</b>	LCG-1 Deployment	Sun 8/31/03	Sun 8/31/03	[Milestone: 8/31]															
4	<b>ATLAS M.</b>	Computing Model Paper	Fri 12/31/04	Fri 12/31/04	[Milestone: 12/31]															
5	<b>ATLAS M.</b>	ATLAS Computing TDR & LCG TDR	Sat 7/30/05	Sat 7/30/05	[Milestone: 7/30]															
6	<b>2.2.1</b>	<b>Coordination</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
7	<b>2.2.1.1</b>	<b>S/W Project Coordination</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
11	<b>2.2.1.2</b>	<b>Data Mgt Coordination</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
15	<b>2.2.2</b>	<b>Core Services</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
16	<b>2.2.2.1</b>	<b>Framework</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
20	<b>LCG M.</b>	SEAL v1 Release	Mon 6/30/03	Mon 6/30/03	[Milestone: 6/30]															
21		New Particle Data Service	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
22		Support for Multiple Threads	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
23		Proto Python Object Browser	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
24		Support for Python Scripting	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
25		Integration of Pool Persistency Service	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
26		Pile-Up Support for Full Detect. Simulation	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
27		Support for Multi Input Streams	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
28		Integration of Seal Plug-in service	Tue 12/30/03	Tue 12/30/03	[Milestone: 12/30]															
29		Integrate SEAL	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
30		Object Browser Integrated with Analysis Tools	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
31		Pile-up Support for DC2 Production	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
32		Support for Unit Testing	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
33		Support for Reconstruction on Demand	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
34	<b>2.2.2.2</b>	<b>EDM Infrastructure</b>	<b>Tue 10/1/02</b>	<b>Tue 3/30/04</b>	[Gantt bar]															
38		Prototype Support for Integer Keys	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
39		Enforcement of RTF Recommendations/Policies	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
40		Support for Writing out Conditions Object on Demand	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
41		Performance optimizations	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
42		Integration with Pool-Cache Manager	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
43		Support for Object Pool	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
44		Proto Support for Composite, Bi-Directional Navigation	Tue 9/30/03	Tue 9/30/03	[Milestone: 9/30]															
45		Multi Thread Support	Tue 12/30/03	Tue 12/30/03	[Milestone: 12/30]															
46		Supp for Persistent Inter-Object Relationships	Tue 12/30/03	Tue 12/30/03	[Milestone: 12/30]															
47		Performance Optimizations	Tue 12/30/03	Tue 12/30/03	[Milestone: 12/30]															
48		Support for History Objects	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															
49		Support for Reconstruction on Demand	Tue 3/30/04	Tue 3/30/04	[Milestone: 3/30]															

•Milestones for ATLAS overall, LCG and U.S. ATLAS

# Computing/M&O budget split



- US Executive Board and US Level 2 managers advise the Project Manager(PM) on M&O/Computing split
- Long standing US Management Contingency Steering Group from the construction project now becomes an advisory body to the PM for the Computing/M&O split
  - **Members:**
    - P. Jenni, T. Akesson, D. Barberis, H. Gordon, R. Leitner, J. Huth, L. Mapelli, G. Mikenberg, M. Nessi, M. Nordberg, H. Oberlack, J. Shank, J. Siegrist, K. Smith, S. Stapnes, W. Willis
  - Represents all ATLAS interests
  - Meets ~ quarterly
  - Unique body that has served ATLAS and US ATLAS well.
- Decisions based on interleaved priorities, case-by-case.
  - US computing presently working with ATLAS computing to prepare “planning tables” as used in the construction project.
    - requires detailed resource loaded schedule

[RP profile](#)

# U.S. ATLAS Research Program



WBS	Description	FY03	FY04	FY05	FY06	FY07
2.0	Computing 1st Allocation	3,440	4,596	6,784	10,494	12,428
2.0	Computing 2nd Allocation	-	-	-	-	-
<b>2.0</b>	<b>Computing</b>	<b>3,338</b>	<b>4,596</b>	<b>6,784</b>	<b>10,494</b>	<b>12,428</b>
	<b>Computing (AY\$)</b>	<b>3,338</b>	<b>4,711</b>	<b>7,155</b>	<b>11,379</b>	<b>13,826</b>
3.1	Sillicon	-	153	554	1,106	1,253
3.2	TRT	173	297	570	470	442
3.3	Liquid Argon	122	1,158	1,598	1,996	1,757
3.4	Tile	119	362	526	881	1,075
3.5	Endcap Muon	188	1,057	1,635	1,525	1,008
3.6	Trigger/DAQ	-	120	96	844	981
	**Common Funds Cat. B (included in subsystems above)	208	248	201	553	751
3.7	Common Funds Cat. A	49	673	835	1,237	1,782
3.8	Outreach	-	28	34	43	45
3.9	Program Management	326	221	955	959	959
3.10	Technical Coordination	-	-	850	850	850
<b>3.0</b>	<b>U.S. ATLAS Total M&amp;O Estimate</b>	<b>977</b>	<b>4,069</b>	<b>7,653</b>	<b>9,911</b>	<b>10,152</b>
4.1	Silicon Upgrade R&D	-	159	485	1,464	1,523
4.2	Liquid Argon Upgrade R&D	-	-	-	481	475
<b>4.0</b>	<b>U.S. ATLAS Upgrade Total</b>	<b>-</b>	<b>159</b>	<b>485</b>	<b>1,945</b>	<b>1,998</b>
	<b>Subtotal U.S. ATLAS RP (AY\$s)</b>	<b>4,315</b>	<b>9,045</b>	<b>15,738</b>	<b>24,234</b>	<b>27,343</b>
	Management Reserve (%)	34.8%	35.8%	32.9%	29.2%	28.4%
	<b>Management Reserve</b>	<b>1,500</b>	<b>3,235</b>	<b>5,182</b>	<b>7,066</b>	<b>7,777</b>
	<b>Total U.S. ATLAS RP AY\$s</b>	<b>5,815</b>	<b>12,280</b>	<b>20,920</b>	<b>31,300</b>	<b>35,120</b>
	DOE Guidance (AY\$s)	3,315	7,280	13,420	21,300	22,620
	NSF Guidance (AY\$s)	2,500	5,000	7,500	10,000	12,500
	<b>Total Guidance (AY\$s)</b>	<b>5,815</b>	<b>12,280</b>	<b>20,920</b>	<b>31,300</b>	<b>35,120</b>

# FY03 Commitments



- Existing effort on Athena and data management
  - FY03: 12 FTEs \$2,293k
    - Project management/coordination 2 FTE
    - Core services 3.75 FTE
      - Program flow, kernel interfaces, user interfaces, calibration Infrastructure, EDM
    - Data management 3.6 FTE
      - Deploying DB services, Persistency service, Event store, geometry+primary numbers
      - Collections, catalogs, metadata
    - Application software 1.4 FTE
      - Geant3 + reconstruction
    - Infrastructure support 1.25 FTE
      - Librarian
- Existing effort on data challenges, facilities
  - 4.5 FTE for T1 infrastructure/management \$925k
- Existing effort on Physics support: 1 FTE \$100k
- UM Collaboratory tools \$20k

Total FY03  
expenditure: \$3,338k

# Proposed FY04 increment



- **Athena + Data Management**
  - Ramps from 12 to 16.5
    - 4.5 FTE priorities / work plan covered in SW talk
- **Facilities/DC Production**
  - T1: (priorities discussed in facilities talk)
    - \$390k for capital equipment
    - Ramp from 4.5 to 6.5 for T1
  - Ramp DC production FTE from 0.9 to 2.5
    - 1.5 FTE at the T1 center
    - 1.0 at university
- This would ramp overall budget from \$3.338 M in FY03 to approximately \$5.2M in FY04.

# FY04 Budget studies



	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Software</b>	2225	2225	2225	2490	2605	3003
<b>Tier1 Equip</b>	391	391	391	391	391	391
<b>Tier1 Labor</b>	1013	1352	1352	1352	1352	1352
<b>Production</b>	268	268	353	353	353	501
<b>Physics</b>	156	156	156	156	156	156
<b>Total</b>	<b>4053</b>	<b>4392</b>	<b>4477</b>	<b>4742</b>	<b>4857</b>	<b>5403</b>

The models are cumulative in effect:

**Model 1: No New Hires, only capital equipment increment at Tier 1, Labour rates increase by 4% on FY03 numbers**

**Model 2: Capital and Labour increment at Tier 1 only**

**Model 3: Increment Production by 1 FTE at UTA**

**Model 4: Increment Software by 0.5 FTE at ANL and 1 FTE at BNL**

**Model 5: Add Detector Description support at Pittsburgh**

**Model 6: Support for all requests.**

- 1-6 run from very bare bones to what we think is the appropriate level for US ATLAS
- Current projections put us at model 4
- Details of the SW FTE increment covered in SW talk by S. Rajagopalan

# Effect on SW FTEs in FY04 budget scenarios



- 1.0 FTE in Graphics
- 0.5 FTE in Analysis Tools
- 1.0 FTE in Data Management

---

- 1.0 FTE in Detector Description

---

- 1.0 FTE in Common Data Management Software

---

- 0.5 FTE in Event Store

Details of these priorities will be in the sw talk

Model 6

Model 5

Model 4

Models 1-3 (increments are in production)

# If forced into a \$4.7M FY04 budget



- SW Cuts :
  - Graphics(1.0 FTE)
  - Data Management (1 FTE):
    - support for non-event data (0.5 FTE)
    - supporting basic database services (0.5 FTE)
  - Analysis tools (0.5 FTE)
  - Det. Description. (1.0 FTE)
- Other cuts in DB/Athena jeopardize our ability to test the computing model in the DC.
- Other cuts in production capability don't allow us to run the DC.
- Delay new hires 1-3 months into the year to balance the budget.

# The University Problem



- US ATLAS has 3 National Labs
  - Lots of expertise, which we are effectively using
- With budget pressures, little project funding left for university groups, both small and large.
- On day 1, when we will extract physics from ATLAS, we NEED university groups fully involved (students, postdocs)
- Solution:???
  - Call on the Management Reserve
    - We are making a list
      - Will include some support for universities already working in the testbed
        - A little goes a long way!
  - Increase in base funding?

# FY05 and beyond



- Major management task for next few months
  - Assigning priorities, establish profile.
  - Guidance ramp up to 7155 k\$ helps
    - But, many things ramping up in FY05:
      - Tier 1
      - Tier 2's !
      - Software
        - Ramp things we cant afford in FY04
        - Further ramps in things like analysis tools
      - Production
        - More DC's → more FTE's for production
    - Makes FY05 look like a tough year also.
  - Guidance for FY06-7 looks better

# Conclusions



- **New management in place**
  - Working well!
- **New WBS**
  - Project funded parts scrubbed.
  - Scope, near-term deliverables well-defined
  - Working on long term and overall ATLAS planning
  - Working on non-project funded parts
- **Budget pressure still hurts**
  - SW scope smaller than we think appropriate
  - Facilities ramping slowly
  - University support lacking

# Regular US ATLAS Computing Meetings?



- We had these in the past, roughly monthly
  - We should start these up again
    - What is the right frequency?
    - When???
- I have received a lot of positive feedback on the tutorials this week.
  - We will have another
    - Probably multi-day, showing the “full chain” generation, simulation, reconstruction and analysis.
    - When, where?