

Schedule, Resources, CCB, LSD & 12GeV

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May 16th 2012

The Long Shut Down
Baseline Review

- **Schedule, Resources, CCB, LSD vs. 12 GeV Project schedule**
- **Response to charges 3, 6 and 7**
 1. Concentrate on that part of the shutdown for which the schedule is fully developed .
 2. Consider scope, schedule and resources.
 3. **Is the critical path understood and articulated?**
 4. Is the approach to management of the “project” appropriate?
 5. Is there is a clear strategy for dealing with problems that might develop?
 6. **Identify schedule or scope contingency; is the schedule contingency adequate?**
 7. **Identify places in the schedule where scope and resources are not well matched?**
 8. Is there work scope outside of the current schedule which could potentially represent constraints or impacts on the schedule; is this adequately addressed?
 9. Have quality, Safety, Risk and other Concerns been adequately addressed?

Schedule

- Information available on the **LSD website**
(https://www.jlab.org/div_dept/directorate/proj_mgmt/lsd/index.html)
- LSD Schedule/Effort: **May 2012 to Sept 2013 & to Dec 2014 (CD4A)**, but has details for activities past Sept 2013.
- **Focus is the first 6 months**
- Update & Re-Evaluation **Aug/Sept 2012**
- LSD team will continue to focus **on long term planning Jan 2013 and on.**
- **WBS structure** based on scope/project and with a detailed resource list by org/division
- **Planning parameters**
 - All JLab Holidays incorporated, no weekend work.
 - Second shift work planned for PEPPo running and Cryomodule commissioning.
- **2,062 activities** with 274,302 budgeted labor hours (**~156 FTE years**) and 3,121 logic links
- **Monthly Schedule Progressing**
 - Cost not managed, only schedule & manpower

Schedule

Integrated schedule (PDF and Excel Version)

Responsibility = Project Manager in charge of this scope/activity

LSD PLAN All Activities 03 May 2012

Durations are given in days and Budgeted Labor is given in hours

Activity ID	Activity Name	Start	Finish	Orig Dur	Budg Lb	Physical % Complete	Predecessors	Successors	Resource IDs	RESP - Responsibility	Total Float	LSD PROJ ABBREV	2012								
													J	F	M	A	May	J	July	A	S
1.3.1.2.3	INSTALL CMFS	29-May-12 08:00 AM	01-Apr-13 04:00 PM	208.00d	1940.80h						77.00d		J A S								
495	4 - SL22 (132113075a)	29-May-12 08:00 AM	11-Jun-12 04:00 PM	10.00d	172.00h	0%	486, 01, 485a	496, 510, 495a	MECH ALIGN TECH, MECH INST TECH, LITE, MECH VAC TECH, DC ELEC TECH, RF ELEC TECH, SRF MECH TECH (Asst), CRYO MECH TECH	HOGAN	0.00d		486, 01	485a	■	496, 510, 495a					

% Complete - Progressed every month (end of the month)

Resource IDs = resources required to perform the scope/activity

- **Schedule is bounded (float relative to these milestones) to the following:**
 - 01M: Start Accelerator Installation Shutdown: 18 May 2012
 - 11M: End of Accelerator Installation Shutdown: 18 Sept 2013
- **Activities beyond current LSD Schedule - Milestones:**
 - 18M: CD-4A (12GeV Milestone): 30 Dec 2014
 - 16M: Beam to Hall A Start: 2 Jan 2014
 - 17M: Beam to Hall D Start: 25 April 2014
 - 17M5: Beam to Hall D: 16 June 2014
 - 19M: Beam to Halls B & C: 1 April 2015

- **Critical Path (22 days or less float analysis)**
 - **12GeV Accelerator Alignment (S/R, Arcs, Inj 0L/0R, & Extraction)**
 - Relative to “Alignment Complete” (must start on 1 Aug 2013)
 - Schedule designed with constraint for internal float
 - **6GeV Cryomodule 0L03/0L04 Re-Commissioning**
 - Relative to “End of Accelerator Installation”
 - Constrained to not start until 12GeV CM commissioning NL26
 - Will review with LSD long term planning efforts & monthly progressing

- **Contingency (Schedule or Scope)**
 - Possible Physics maintenance deferment
 - Second shift/weekends available – if funding can support
 - Accelerator restoration/recovery plans are not in this schedule. Is there schedule contingency in this time period?
 - End of Accelerator Installation: Sept 18, 2013
 - CD-4A (12GeV Milestone): 30 Dec 2014

- **Skill Types – Detailed by Organization**

- Built into schedule from initial development for each project lead to use when building their schedules
- This detailed skill type used for resource validation/leveling process

- **Head Count Graph**

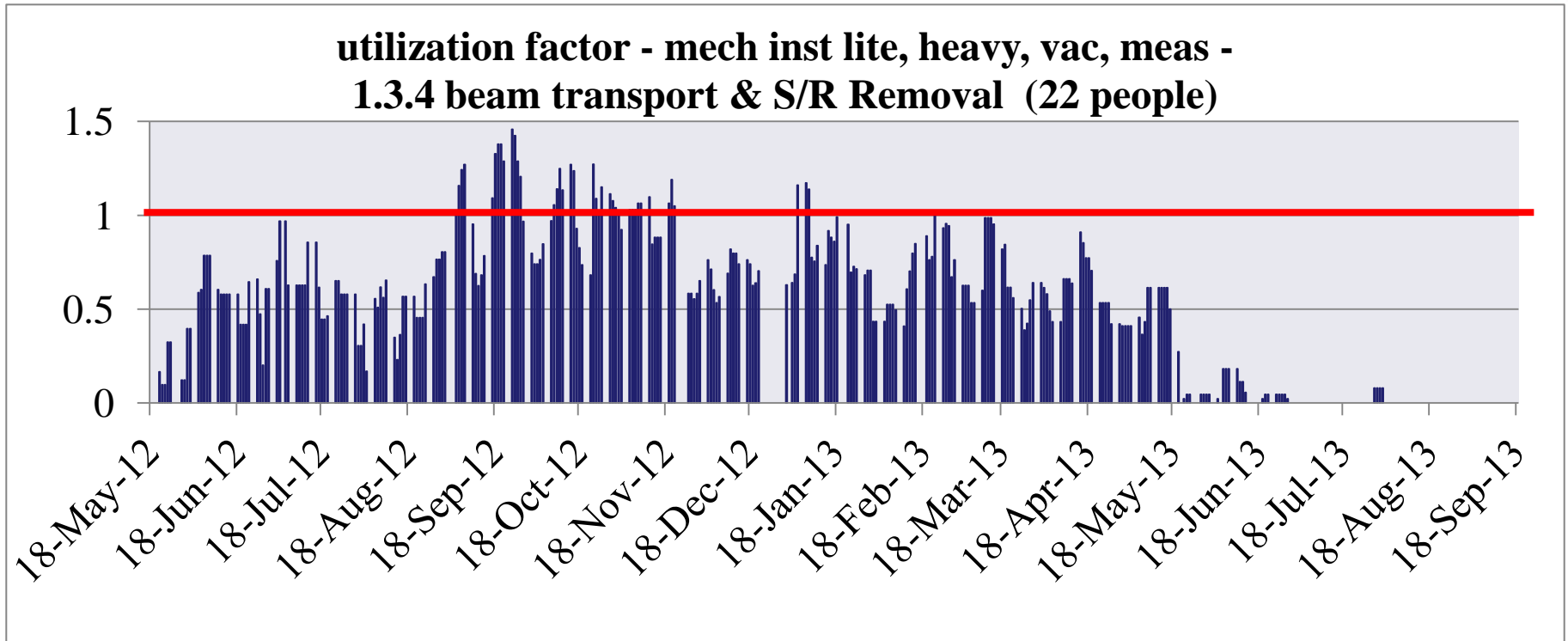
- Head count per day required for the number of person hours being asked for

- **Utilization Factor Graph**

- Utilization Factor =
$$\frac{\text{total hours per day for activities}}{(\# \text{ people available} \times 8 \text{ hours})}$$
- Utilization factors ≥ 1 indicate a problem
- Nominal Utilization Factor of 0.85 to 0.90 used

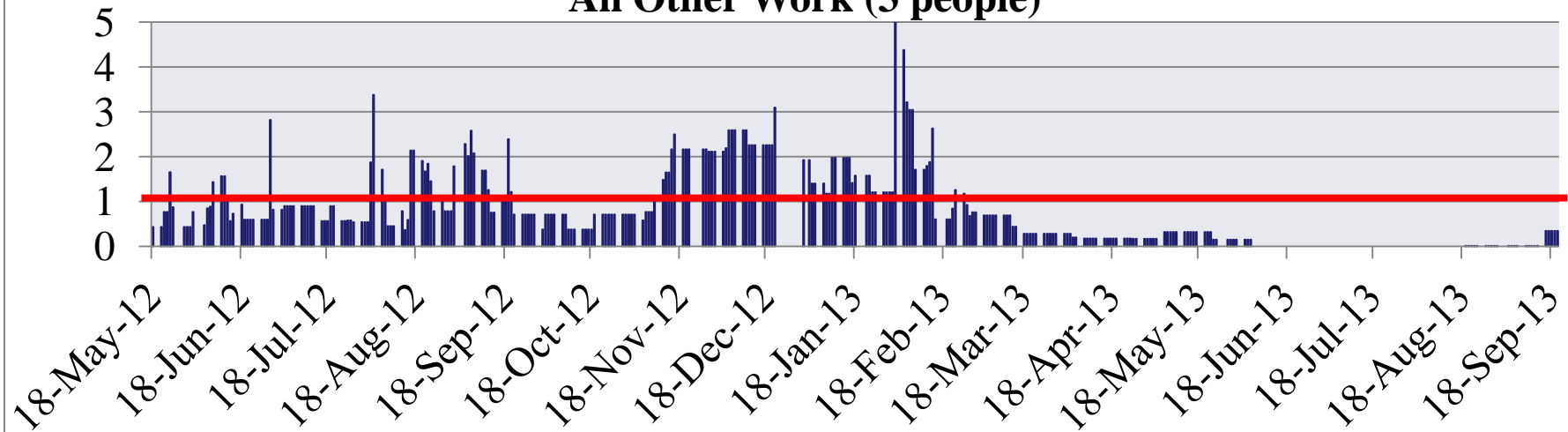
Resource Name	Resource ID	Group Leader
MECH TECH	MECH ALIGN TECH	C. Curtis
	MECH MAG TST TECH	K. Baggett
	MECH INST TECH	A. Dipette
	MECH VAC TECH	J. Heckman
ELEC TECH	DC ELEC TECH	B. Merz
	RF ELEC TECH	B. Merz
	ICD ELEC TECH	O. Garza

- Resource Leveling Focus: **May 2012 to Jan 2013**
- Resources **NOT** leveled/analyzed (internally leveled by the specific work group):
 - Physics Halls
 - Cryogenics work group
 - SRF technicians
 - Accelerator Operators & Software Group
 - FEL
- **Steps:**
 1. Schedules reviewed by team & changes implemented
 2. Resource data files generated (for each resource type)
 3. Reviewed by group leaders & changes implemented
 4. Challenged Resources (Utilization Factors above 0.85 to 0.90) evaluated
 5. Associated scope/project managers with resource providers adjust schedules to reduce peaks



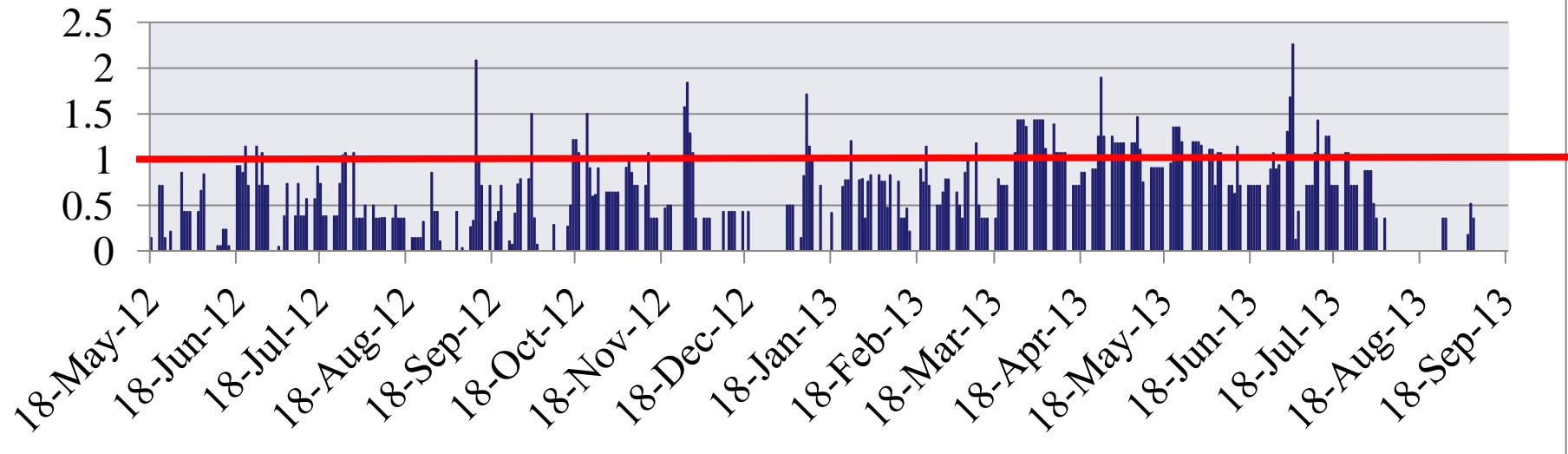
- Schedule was developed with 22 people (0.85 = FTEs) as a constraint
- More details from L. Harwood presentation

**utilization factor - mech inst lite, heavy, vac, meas -
All Other Work (3 people)**



- **6/28/12: West Recombiner removal & Access prep for Inj CM shuffle**
 - Equipment & resources types to perform both will be in the same area – work is manageable
- **Aug/Sept 2012: 6GeV Maintenance & Warm Up**
 - Activities have flexibility & can be done in the next three months
- **End Nov/Dec 2012: Cool Down**
 - Surge resources identified to support (Injector, SRF, Hall D) – will re-evaluate during schedule update in Aug/Sept 2012
- **Feb 2013: 6GeV Acc Maintenance placeholder activities**

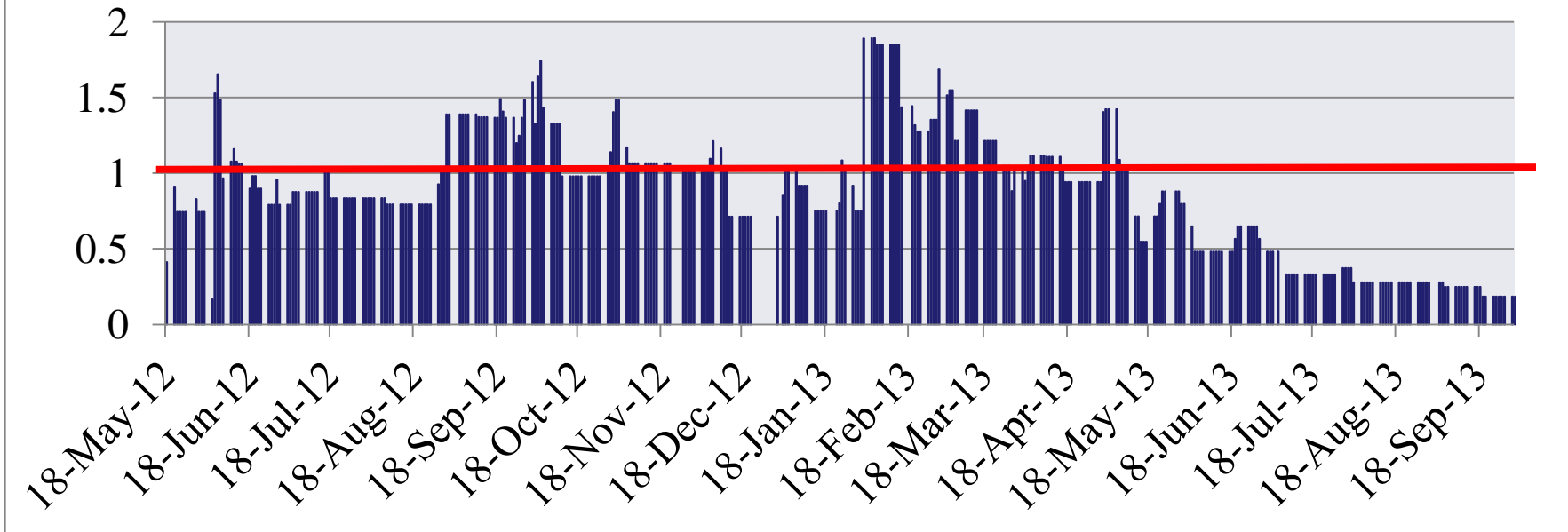
utilization factor - mech align tech (7 people)



- Scope is entire LSD activities (12GeV Beam Transport, Halls post run surveys, Hall D, networks & re-alignment of entire machine)
- Outfitted 3 crews with 2 summer students (leaving mid August 2012)
- Traditionally these resources are an issue particularly towards the end of the down
- 12GeV Hall B & C Installation work not included – See W. Oren presentation
- 12GeV Accelerator Final Alignment can be done as early as feasible

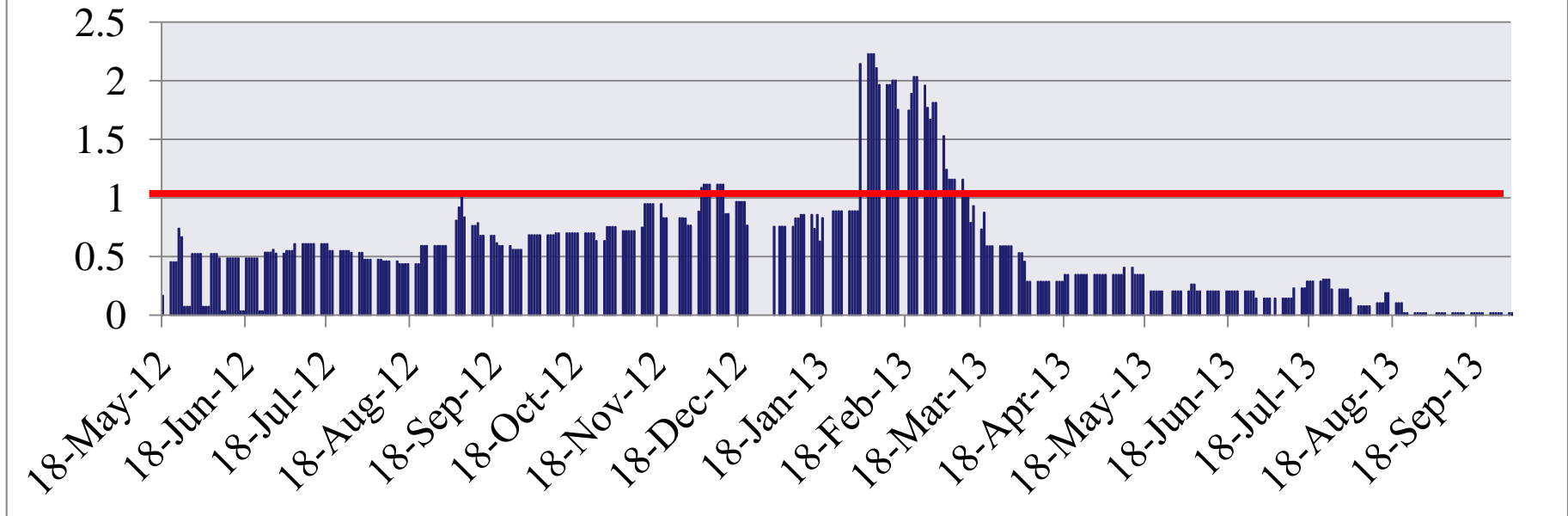
- **Reassignment of Engineering Staff**
 - 6 electrical engineering support group technicians moved to Hall B Cable Removal (captured in resource graphs)
 - 3 injector group members moved to installation/vacuum for “Other” (non-12GeV) scope
- **Strategy for Staffing 12GeV Beam Transport**
 - No new contractors/limited hire
 - 22 “heads” assigned to this effort
 - Reassign underutilized people from others areas
 - 4 electrical engineering support group technicians
 - 5 operators

utilization factor - dc elec tech (6 people)



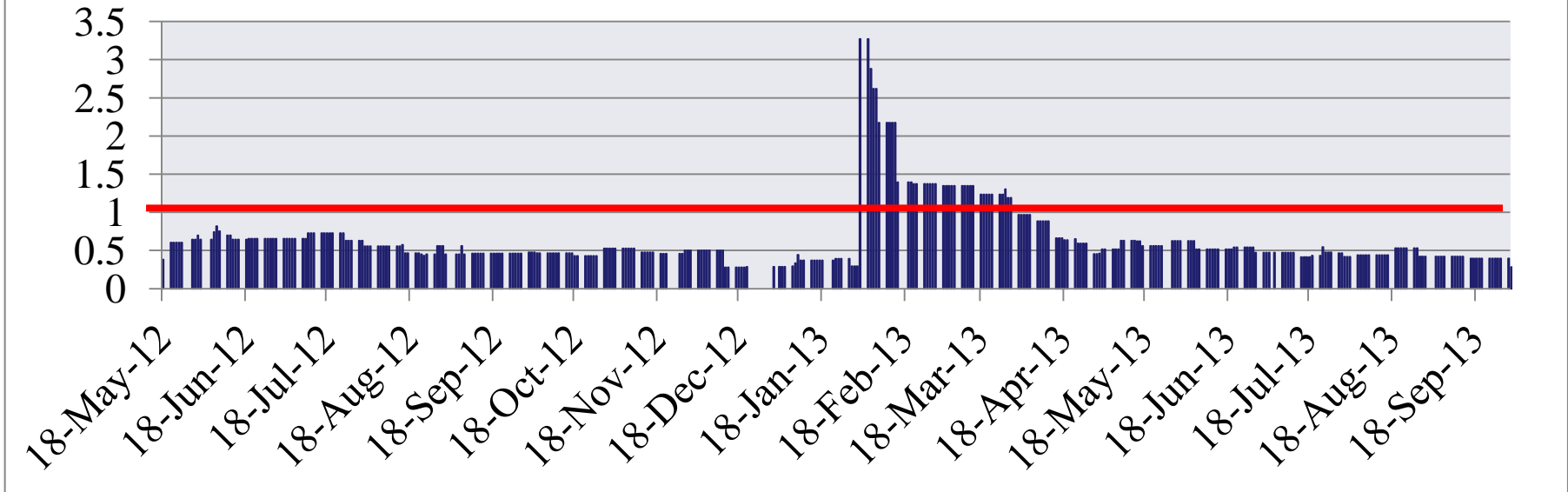
- Feb 2013: 6GeV Acc Maintenance placeholder activities
- Plan to balance between ICD, RF, and DC Electrical technician available resources

utilization factor - rf elec tech (7 people)



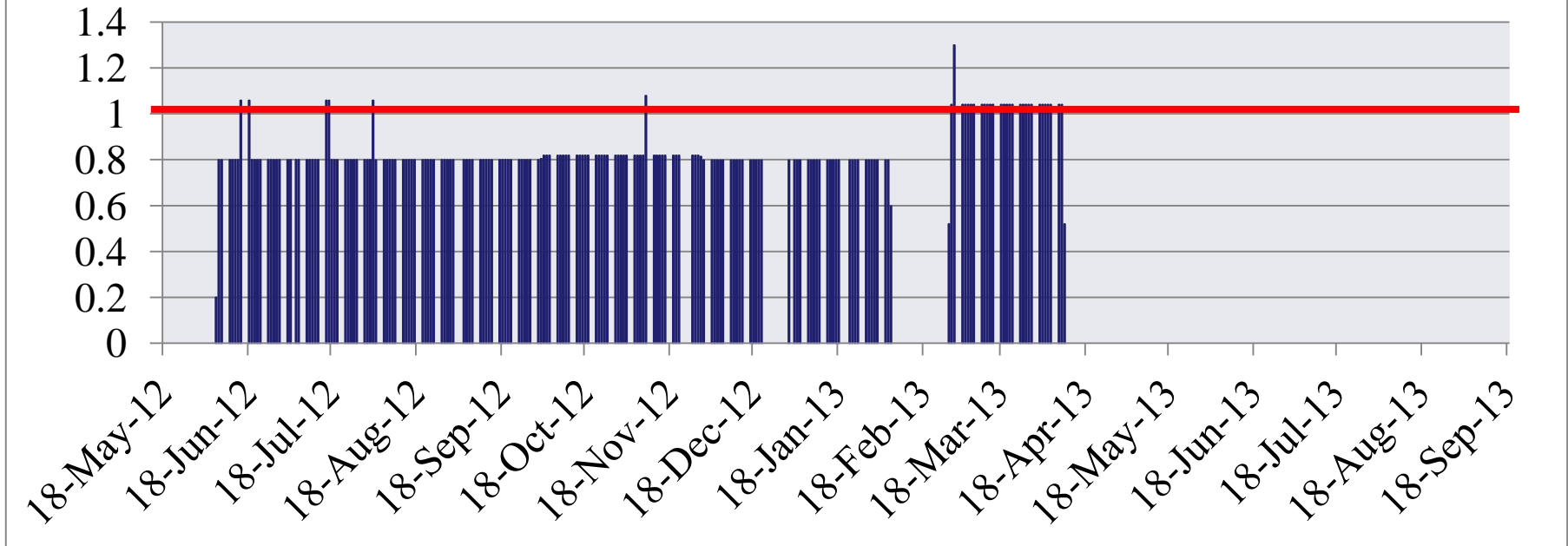
- Feb 2013: 6GeV Acc Maintenance placeholder activities

utilization factor - icd elec tech (9 people)



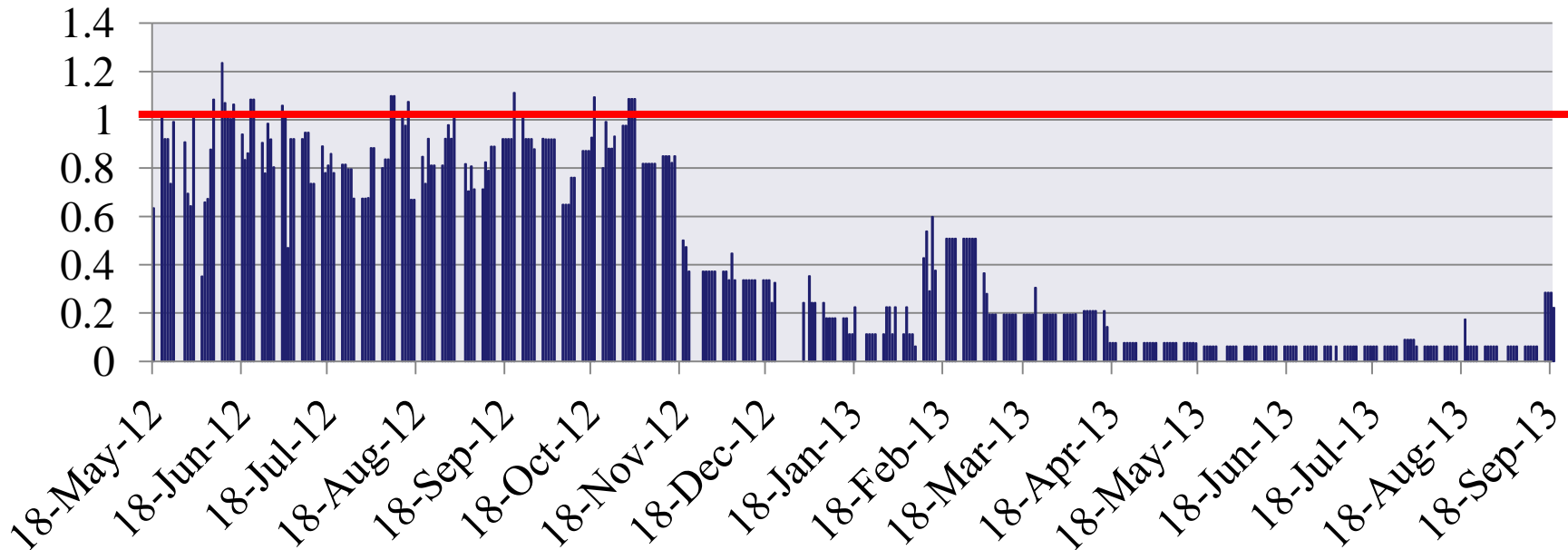
- Feb 2013: 6GeV Acc Maintenance placeholder activities

utilization factor - machine shop (3 people)



- 12GeV Beam Transport Scope only
- Taxing JLab's internal machine shop (utilizes 1/3 of the machinists)
- Limits flexibility & more work will be sent off site during the shutdown

utilization factor - radcon tech (4.5 people)



- Week of 11 June: RadCon training with people out – but other work is manageable

- **Change Control Board (CCB):**
 - D. Napier (Change Request Coordinator (CRC))
 - F. Pilat (LSD Coordinator)
 - W. Oren (Engineering)
 - S. Suhring (Accelerator Operations)
 - L. Harwood (12GeV Accelerator)
 - G. Young (12GeV Physics)
 - J. Gomez (Physics)
 - Advisors: LSD Deputy (during their rotation period), D. Owen (ESH&Q), H. Derby, P. Collins (PMI)
- **“Page 1”** of the change request **submitted by project managers** to the CRC (Change Request Coordinator)
- **CRC - D. Napier**
 - Collects all changes (from PMs, from meetings, etc)
 - Managed through a shared change request (CR) log
- CCB meets **monthly** (or as needed) to review log and change requests submitted

- **Upcoming Changes:**

1. Progress Update from 12GeV Project schedule progress collected (as of end of April 2012)
2. Cryogenics Work Group Schedule – partial (W. Oren)
3. FEL Schedule Updates (Darklight, etc.)
4. Tunnel De-humidifiers (R. Sperlazza/S. Suhring)
5. 12GeV Beam Transport Smoothing Mech Tech profile (M. Bevins/L. Harwood)
6. 12GeV Hall B Schedule – June/July Review (Latifa/Glenn)
7. 12GeV Hall C Schedule – June/July Review (Howard/Glenn)
8. Counting House Renovation Impacts on physics staff workflow (B. Sperlazza/W. Akers) – Funding Dependent

LSD & 12GeV Project Schedules

- **Structure:**
 - Mirrored 12GeV WBS structure & activity IDs for LSD
 - 12GeV Project Schedule (one for one) into LSD:
 - 1.3.2 (Power Systems), 1.3.5 (Extraction), 1.3.6 (IC&S)
 - 1.3.1 (Cryomodules), 1.3.3 (Cryogenics), & 1.3.4 (Beam Transport) - portions of 12GeV project schedule are one-for-one
 - For all other 12GeV scope (Hall A & Hall D) – correlation to 12GeV activity IDs are done
- **Monthly Progressing of the Schedules**
 - PMI will send progress excel sheets to PMs (RESP – Responsibility) – just like the 6MSD
 - PMI will send the sheets the last week of the current month to progress that month's activities (End of May to collect May progress).
 - Non-12GeV activities - Due to PMI 2 business days after the end of the month
 - 12GeV activities will be collected through existing 12GeV progress process
- **Comparison File & Analysis for LSD Progress Schedule verses 12GeV Baseline by D. Napier**
- **Change Control for LSD and 12GeV Project coordinated through Integration Engineer, D. Napier**

Questions?