

Operations Report for Oct. 1, 2008 to Dec 23, 2009 (FY09 & FY10-1)

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**Research Accelerator Division
Spallation Neutron Source**



SNS Goals

Run Schedule

Performance

Downtime

Operations

SNS Goals

Year	Neutron Production Availability		Integrated Beam Power (MW-hrs)	
	Commitment	Actual	Commitment	Actual
FY2007	75.0%	65.7%	117	159
FY2008	82.5%	72.0%	887	945
FY2009	80.0%	80.7%	2031	2166
FY2010	85.0%	85% YTD	3248	1036 YTD
FY2011	88.0%	TBD	5322	TBD

Year	Neutron Production Hours		Total Operating Hours	
	Commitment	Actual	Commitment	Actual
FY2007	1500	2113	3500	3779
FY2008	2700	2807	4000	4032
FY2009	3500	3553	4500	4916
FY2010	3900	1472.5 YTD	4800	1642.9 YTD
FY2011	4300	TBD	5000	TBD

FY09 Run Schedule

Run Schedule for FY 2009

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
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Run 2009-1

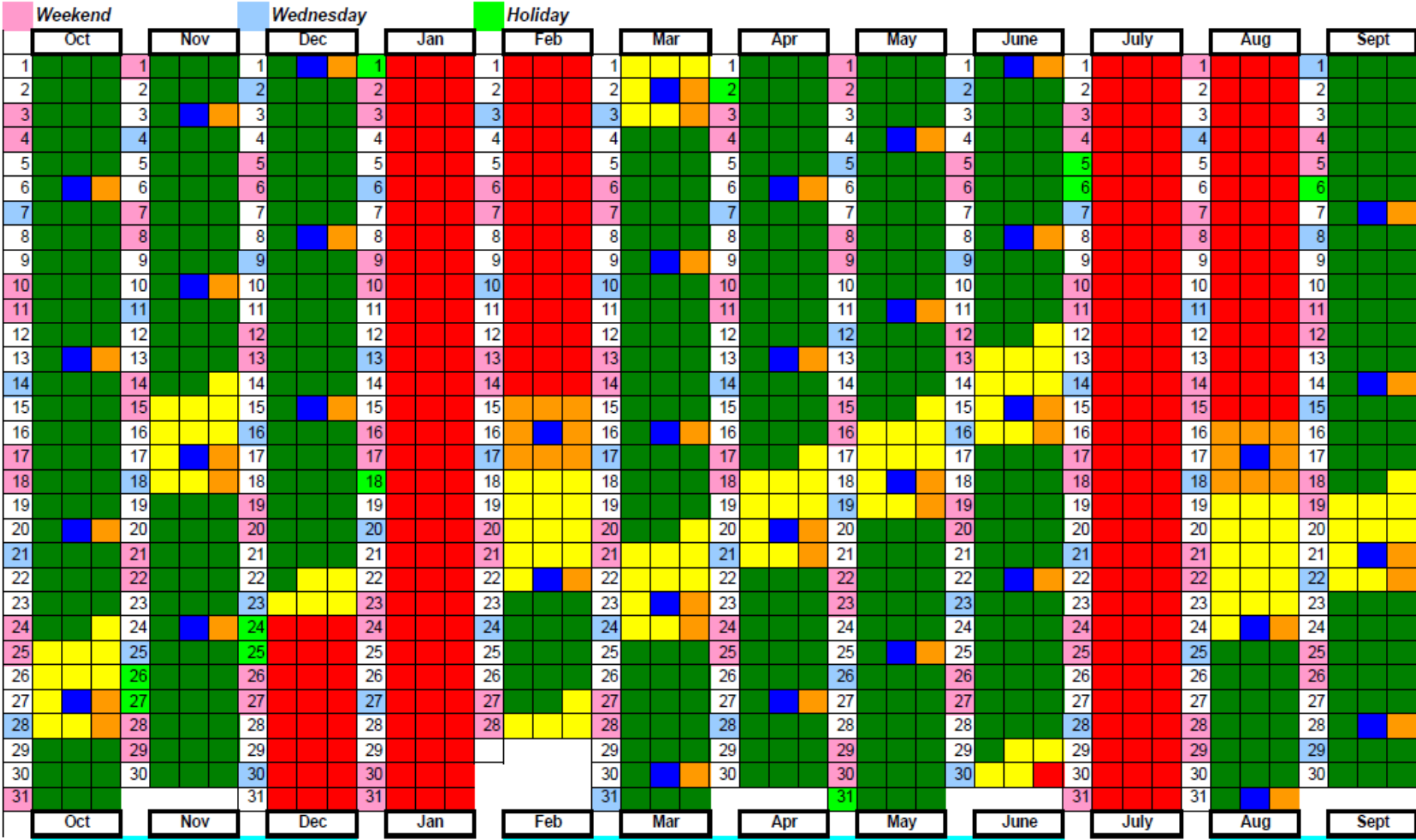
Run 2009-2

Run 2009-3

- Accelerator Physics
- Machine Downtime Major Periods(Maintenance/Upgrades)
- Accelerator Physics Option
- Downtime Periods Weekly Maintenance Option/Remedial tuning
- Accelerator Startup/Restore
- Neutron Production

FY10 Run Schedule

Run Schedule for FY 2010



Neutron Production

Accelerator Physics

Accelerator Startup/Restore

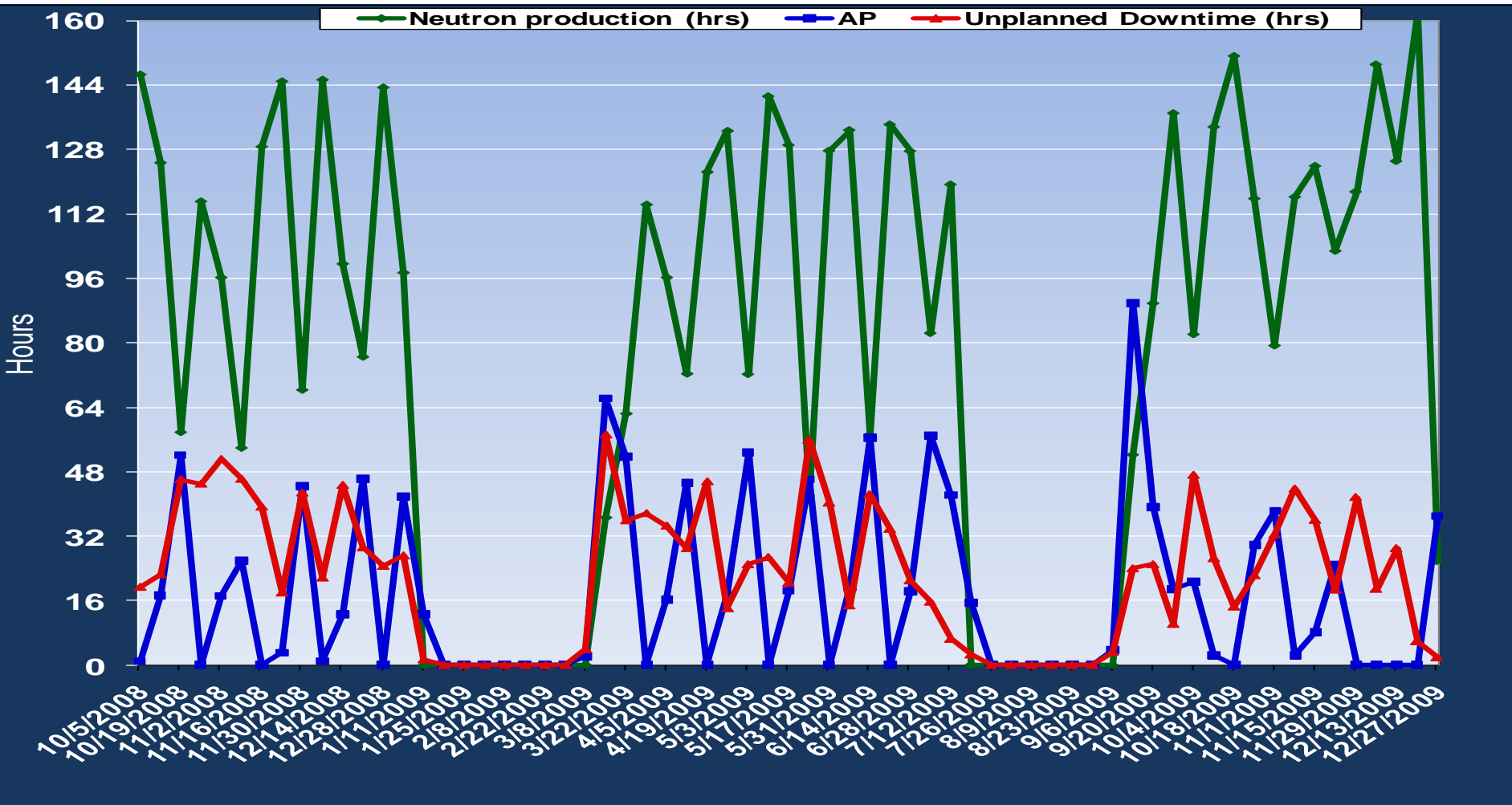
Run 2010-2

Machine Downtime Major Periods (Maintenance/Upgrades)

Downtime Periods Weekly Maintenance Option/Remedial tuning

Run 2010-3

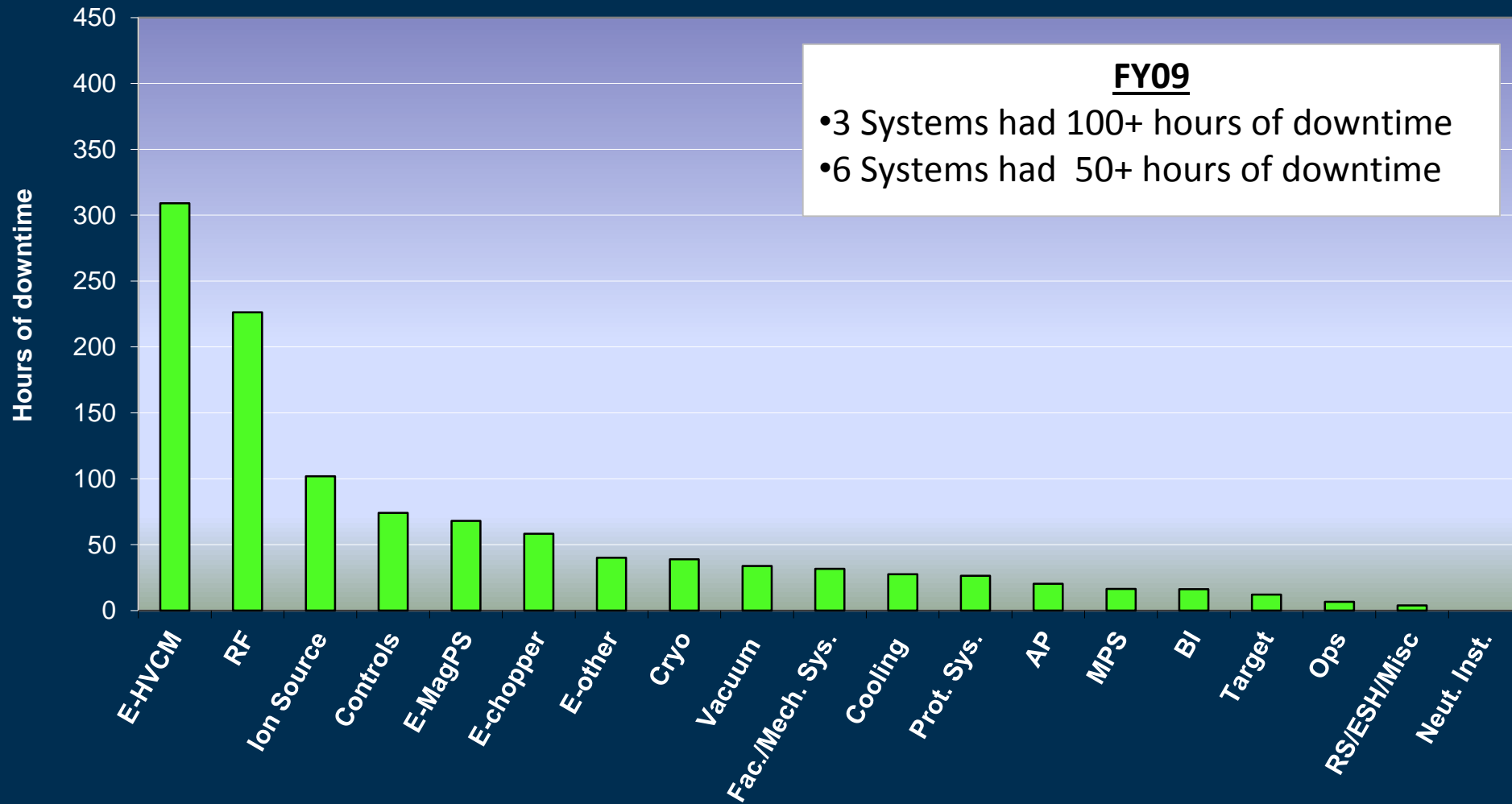
Hours / week - Target / Down / AP – FY09 & FY10-1



- Cadence between scheduled AP and NP time is seen on the hours/week plot.
- Historically, downtime has been high initially when turning on from a long shutdown. However, downtime was significantly lower during the September turn-on, which is promising.



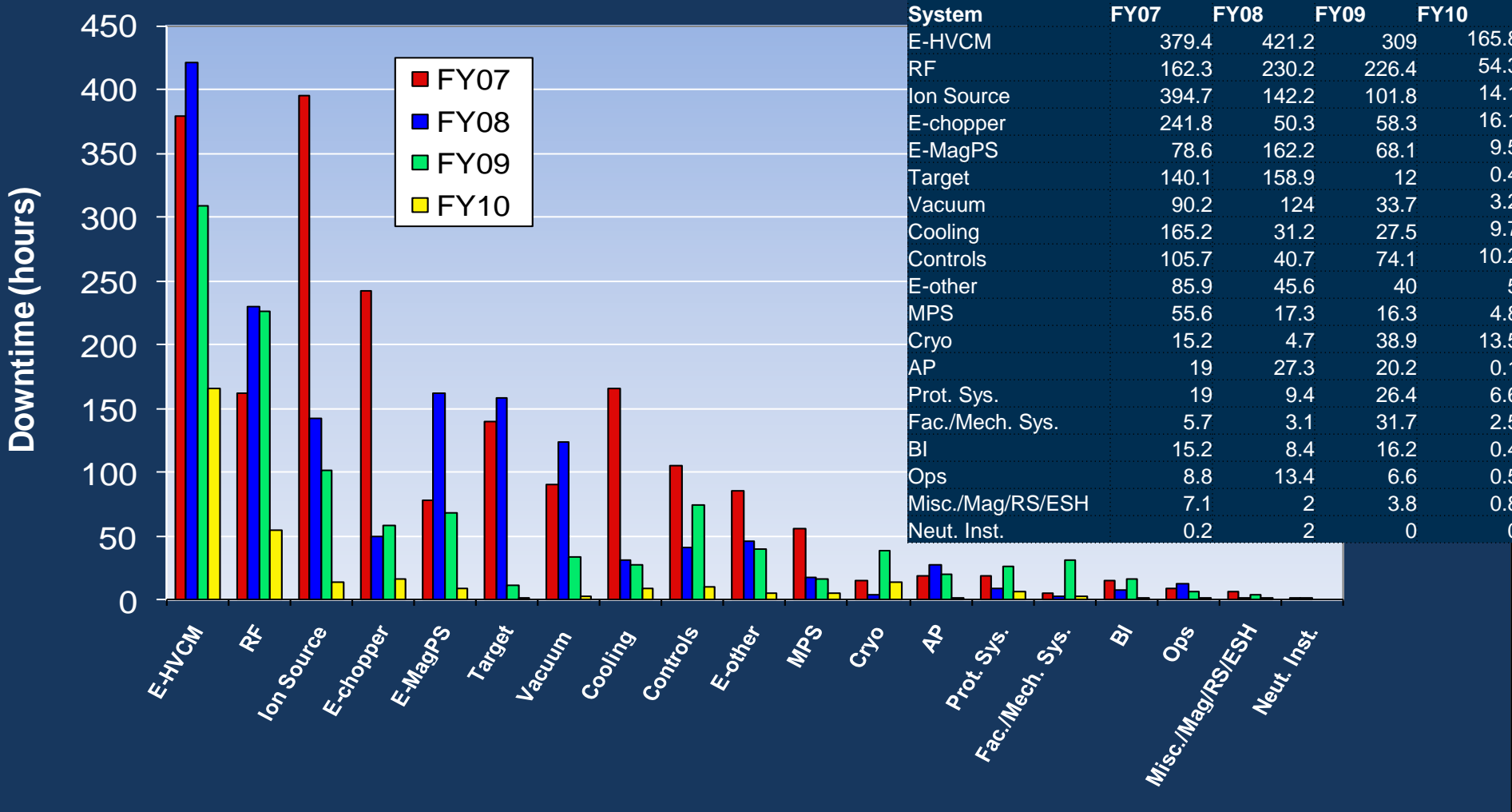
Downtime Comparison by Fiscal Year



• Downtime has been reduced every fiscal year:

- FY07 - 7 systems with 100+ hours, 11 systems with 50+ hours
- FY09 - 3 systems with 100+ hours, 6 systems with 50+ hours

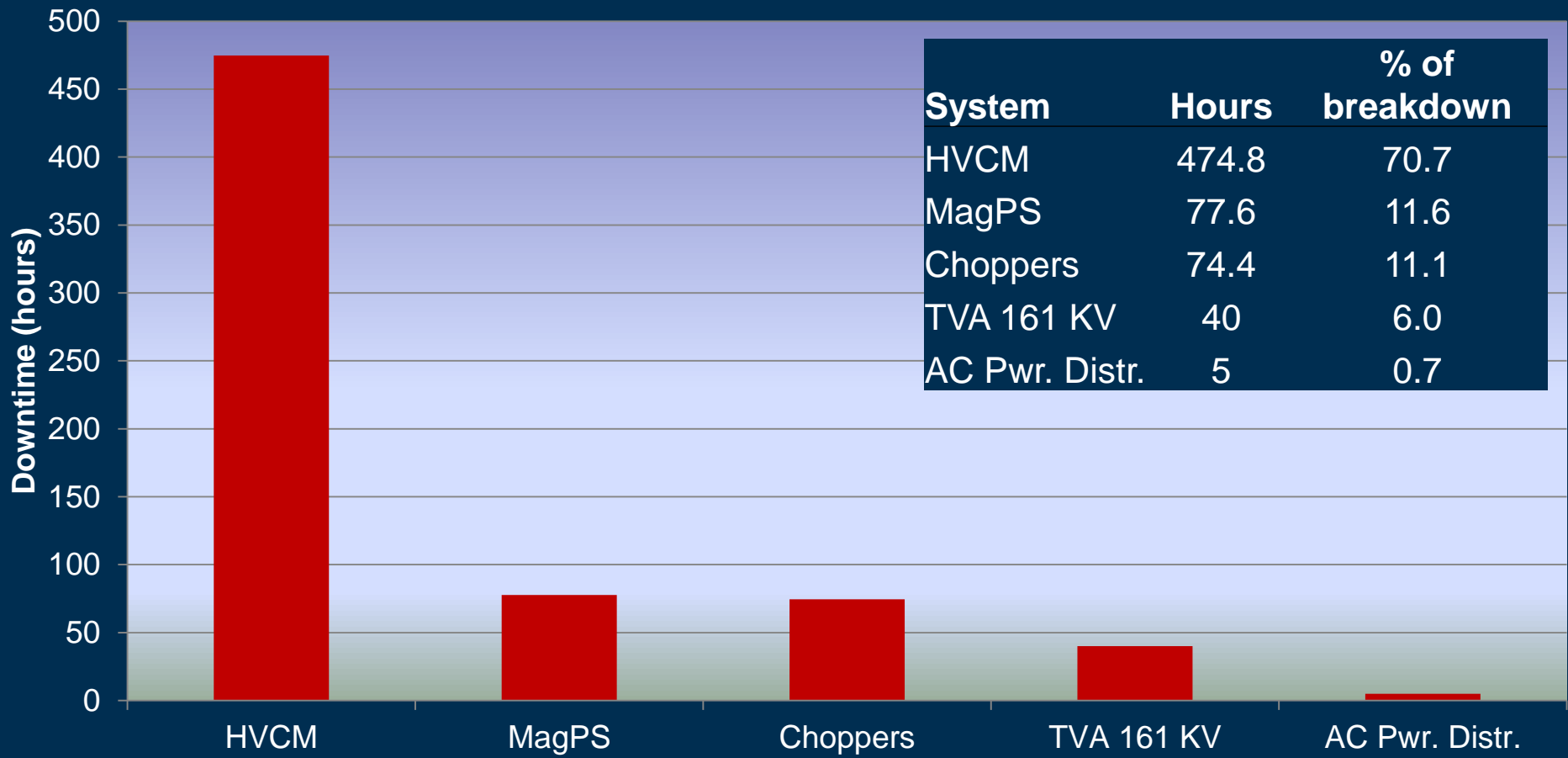
Downtime Comparison by Fiscal Year



- We are reducing downtime while increasing beam power and operating hours.



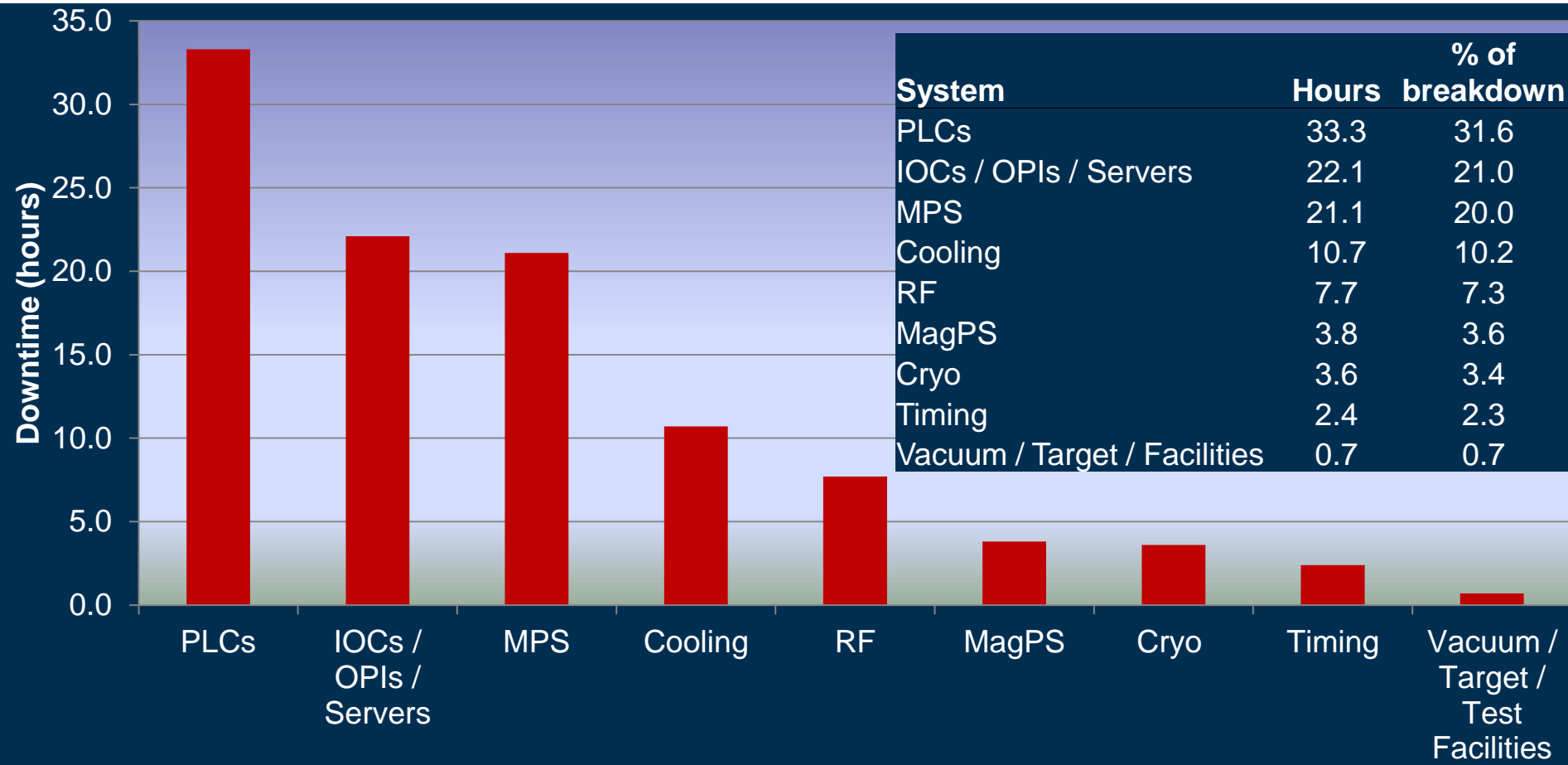
Electrical Systems Downtime, FY09 & 10-1



- Modulators take the bulk of Electrical downtime with 475 hours.
- V. Peplov and D. Anderson will discuss modulator improvements during their presentations.



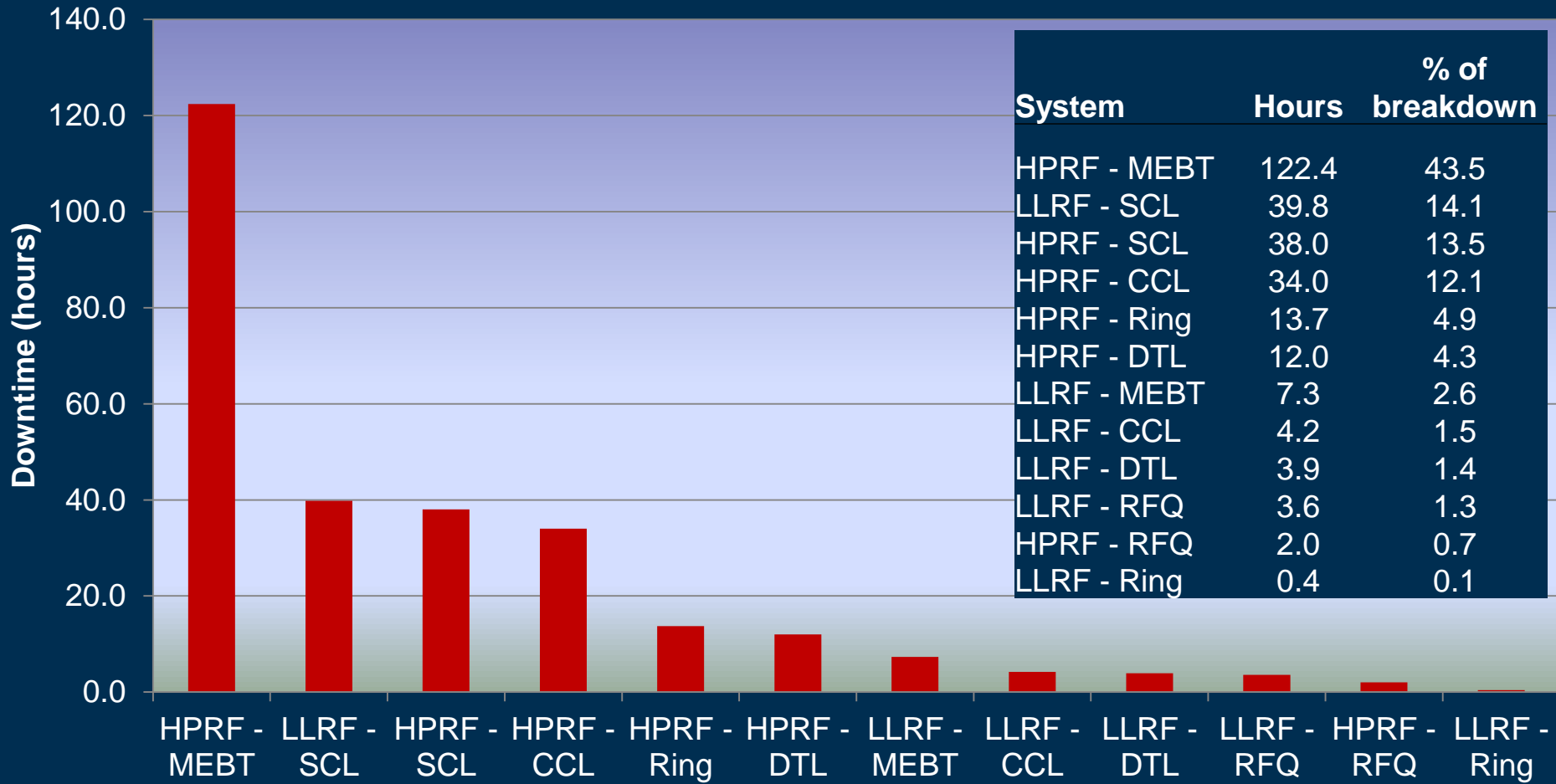
Control Systems Downtime, FY09 & 10-1



- **PLC, IOC, OPI, Servers, and MPS issues were the main source of Controls downtime in FY09.**
- **K. White will discuss the Control System improvements in her presentation.**

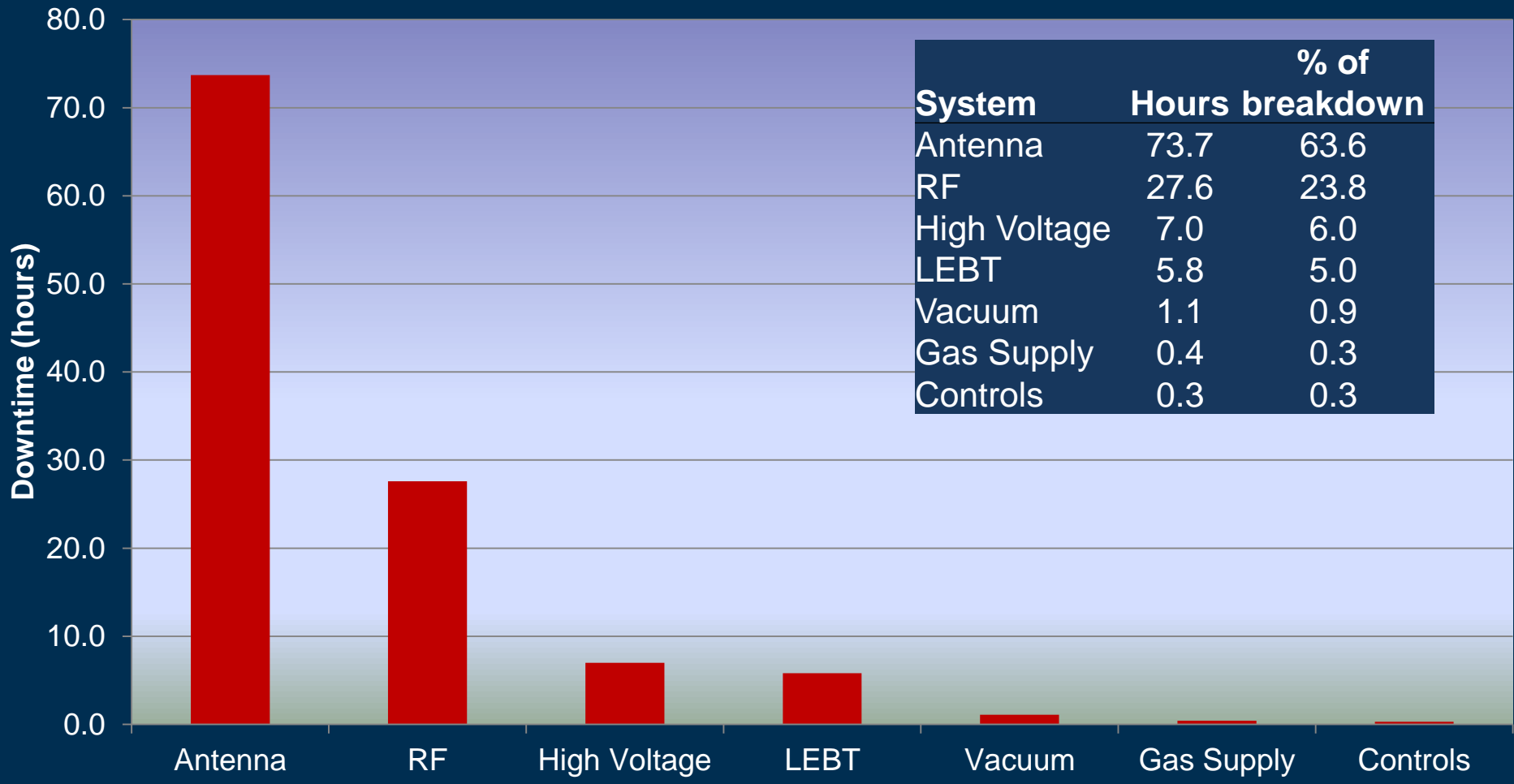


RF Systems Downtime, FY09 & 10-1



- **MEBT RF was the main source of RF downtime in FY09.**
- **T. Hardek will discuss the MEBT RF improvements in his presentation.**

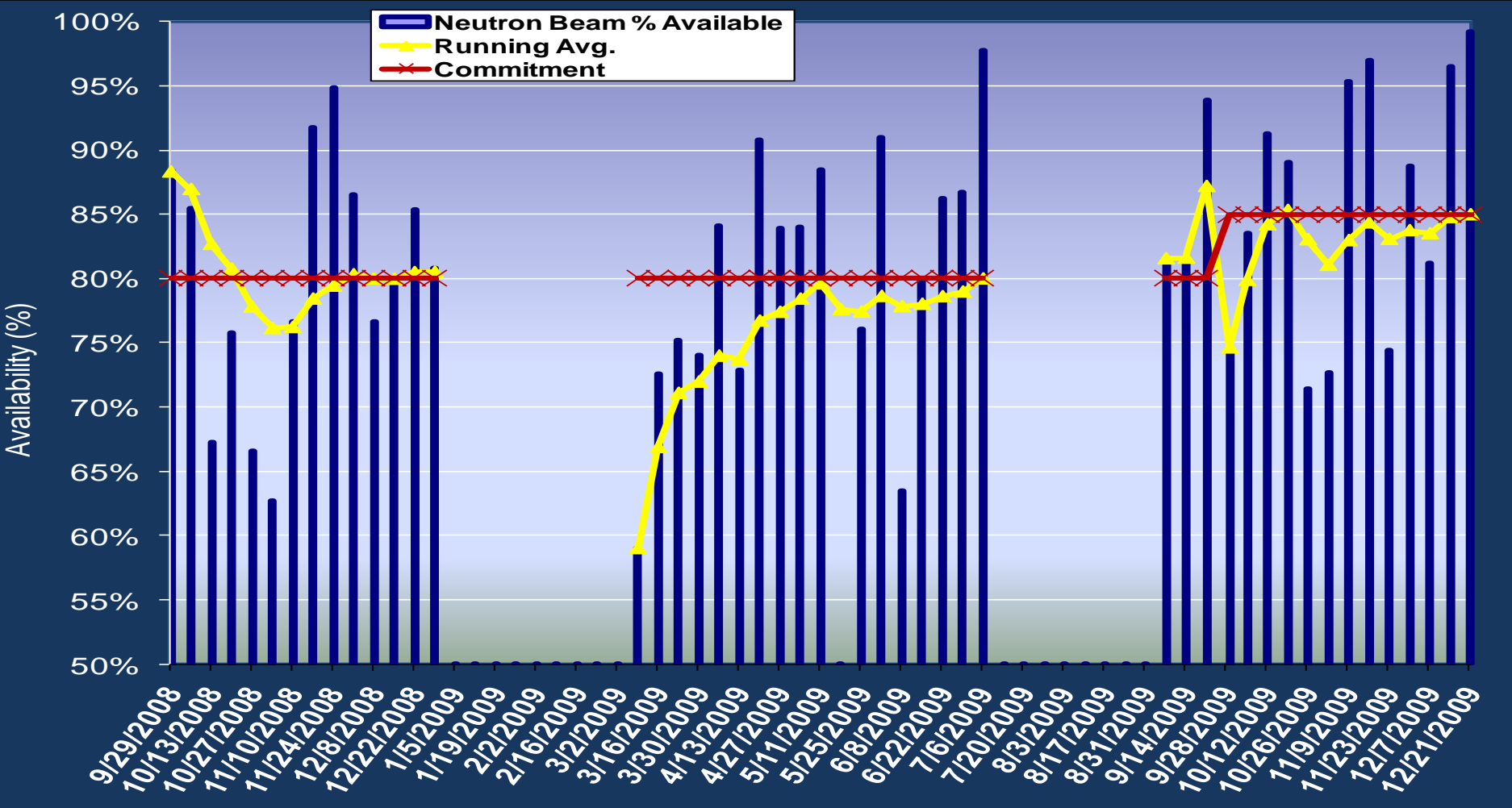
Ion Source Downtime, FY09 & 10-1



- Antenna failures were the main source of ion source downtime.
- M. Stockli will discuss ion source development in his talk.



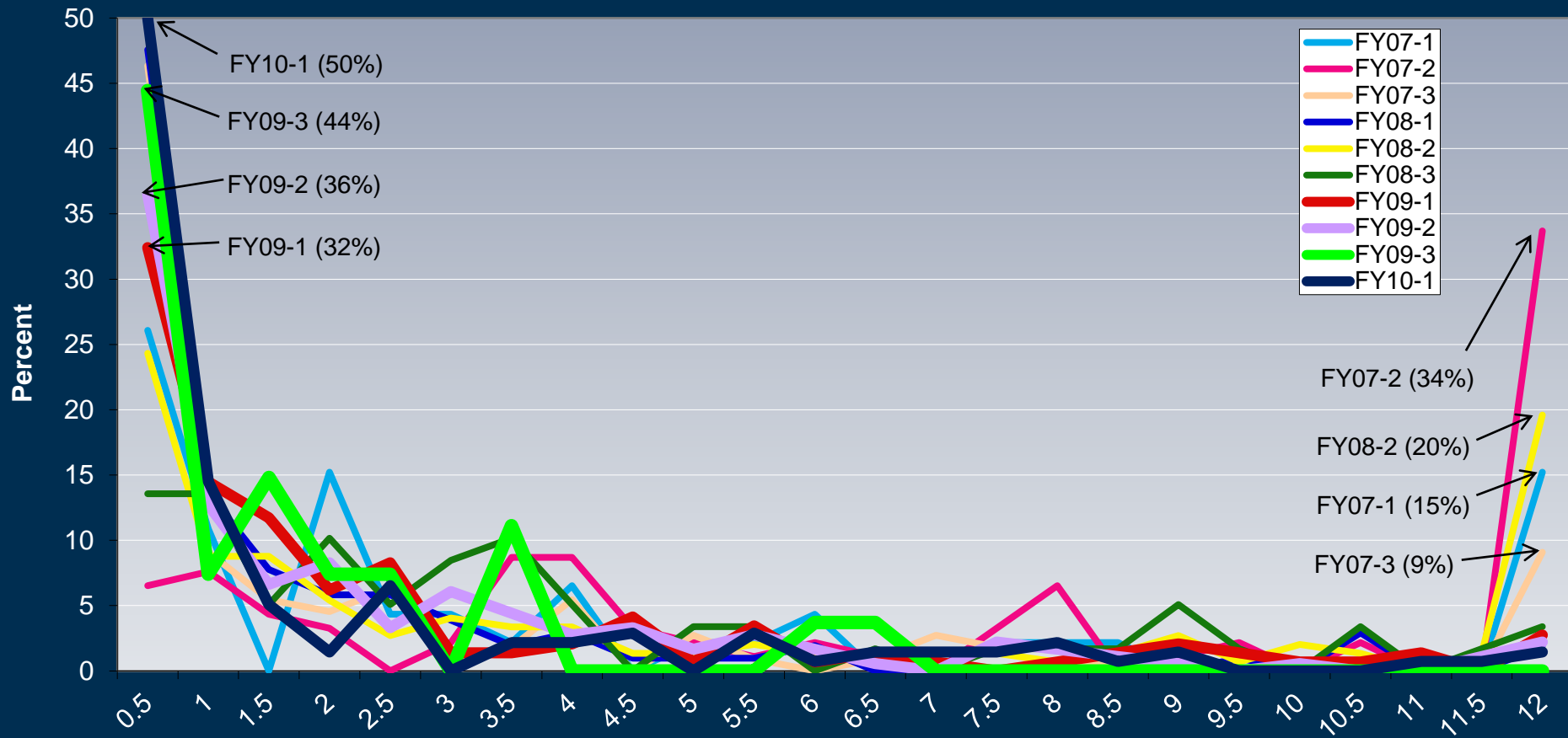
NP Availability by week, FY09 & FY10-1



- For FY09, availability was 95% or greater during 2 weeks.
- For FY10 Run-1, availability was 95% or greater during 4 weeks.



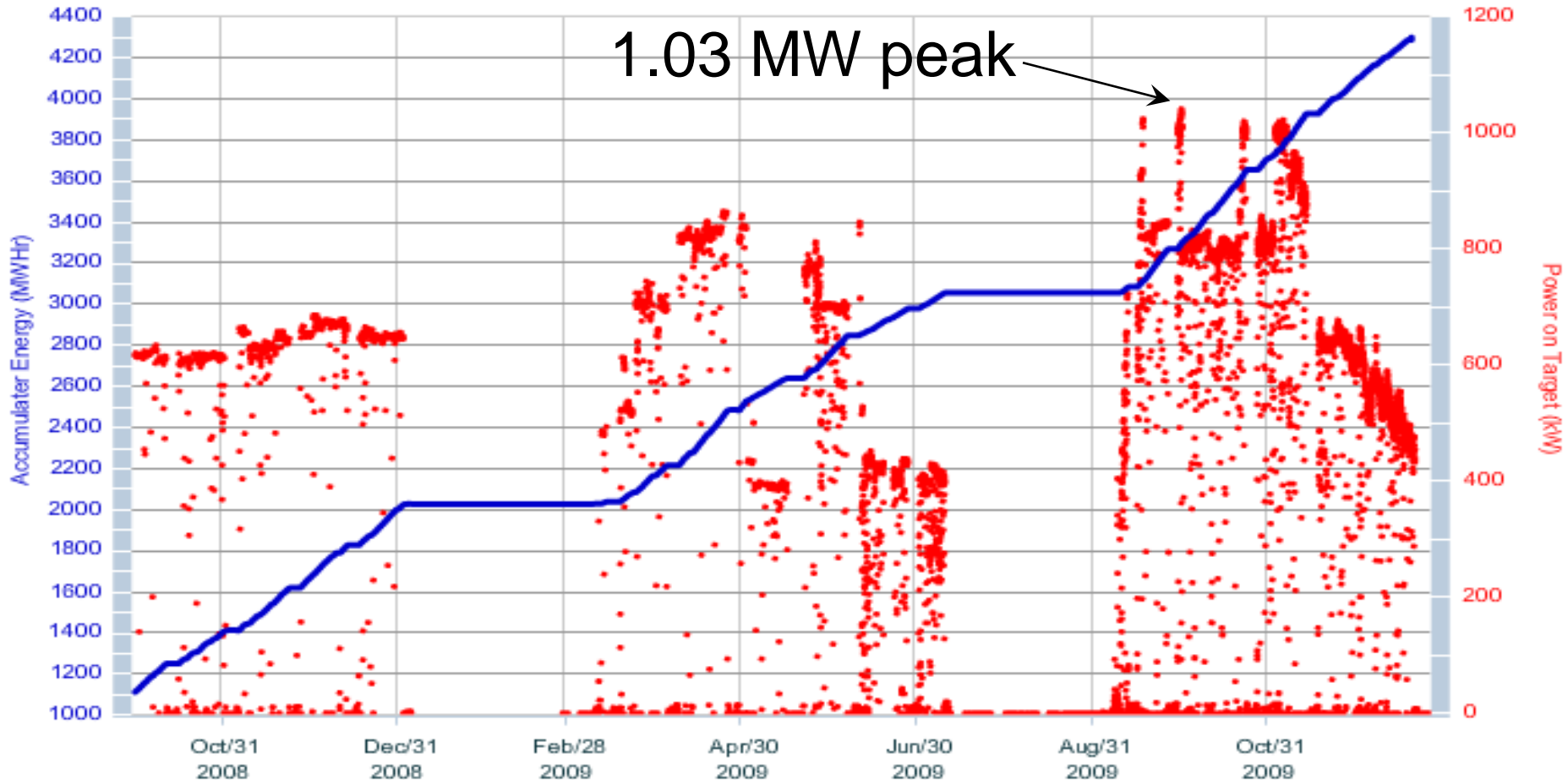
Downtime per 12 Hr Shift by Run Normalized by Total Number of Shifts



- In FY07 & 08, significant percentages of shifts spent all 12 hours in downtime.
- In FY09 & 10, significant percentages of shifts had 0.5 hours or less of downtime.

Beam Power on Target

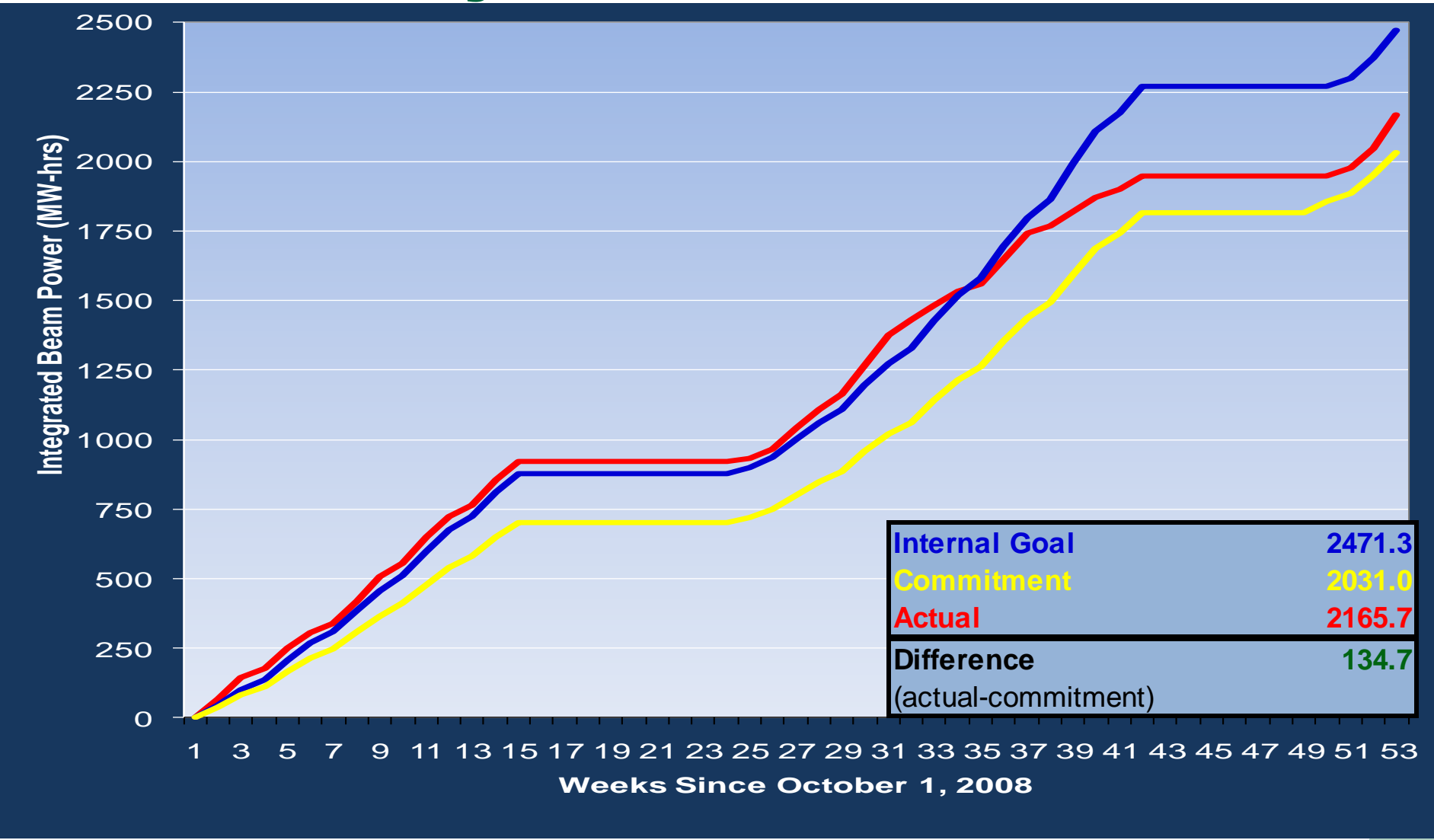
Power on Target



- Peak beam power on target of 1.03 MW.



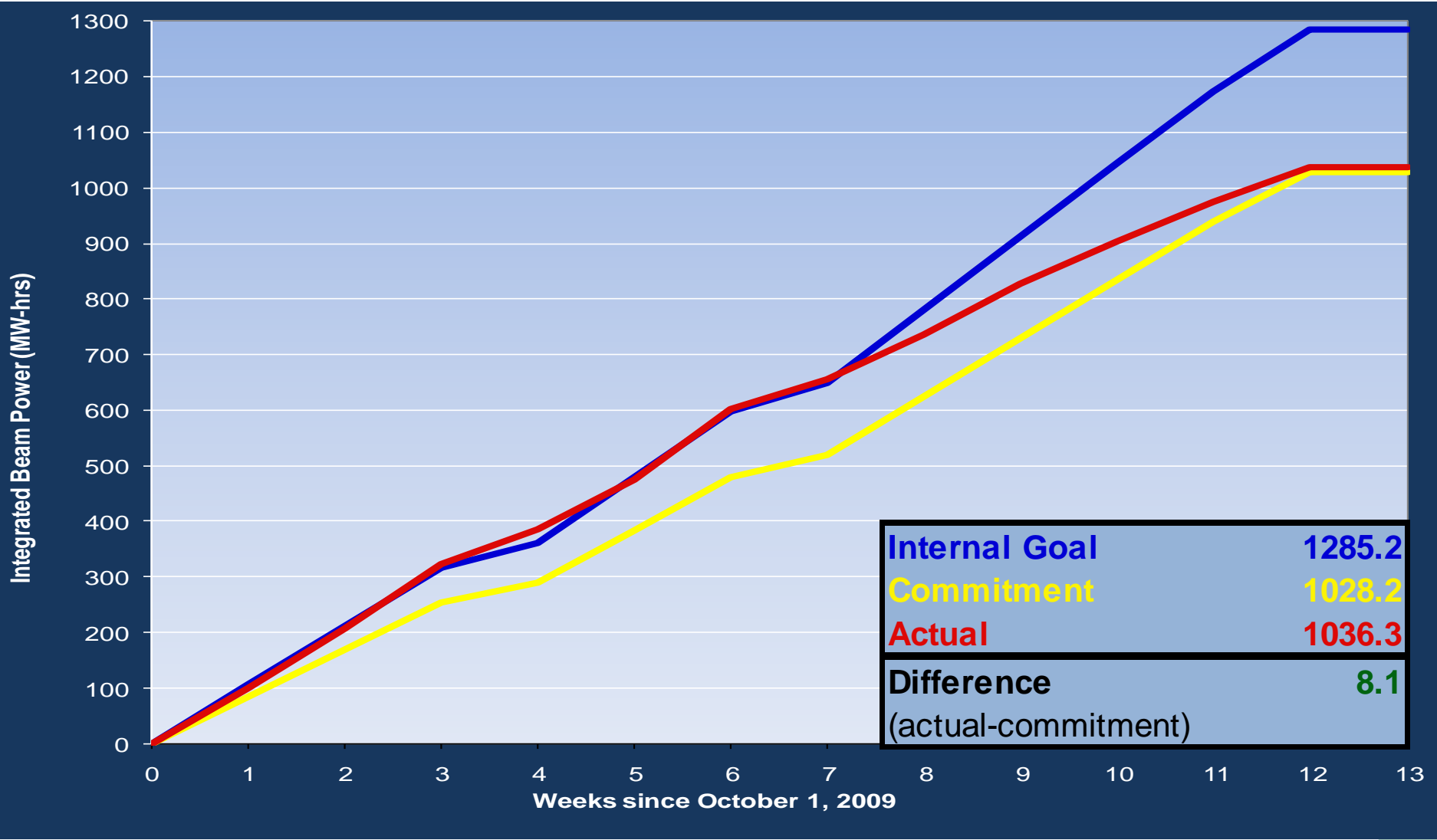
Power Delivery Goals for FY09



- Exceeded the MW-hr commitment for FY09
- We were above the internal goal until we reduce beam power due to the foil issue



Power Delivery Goals for FY10

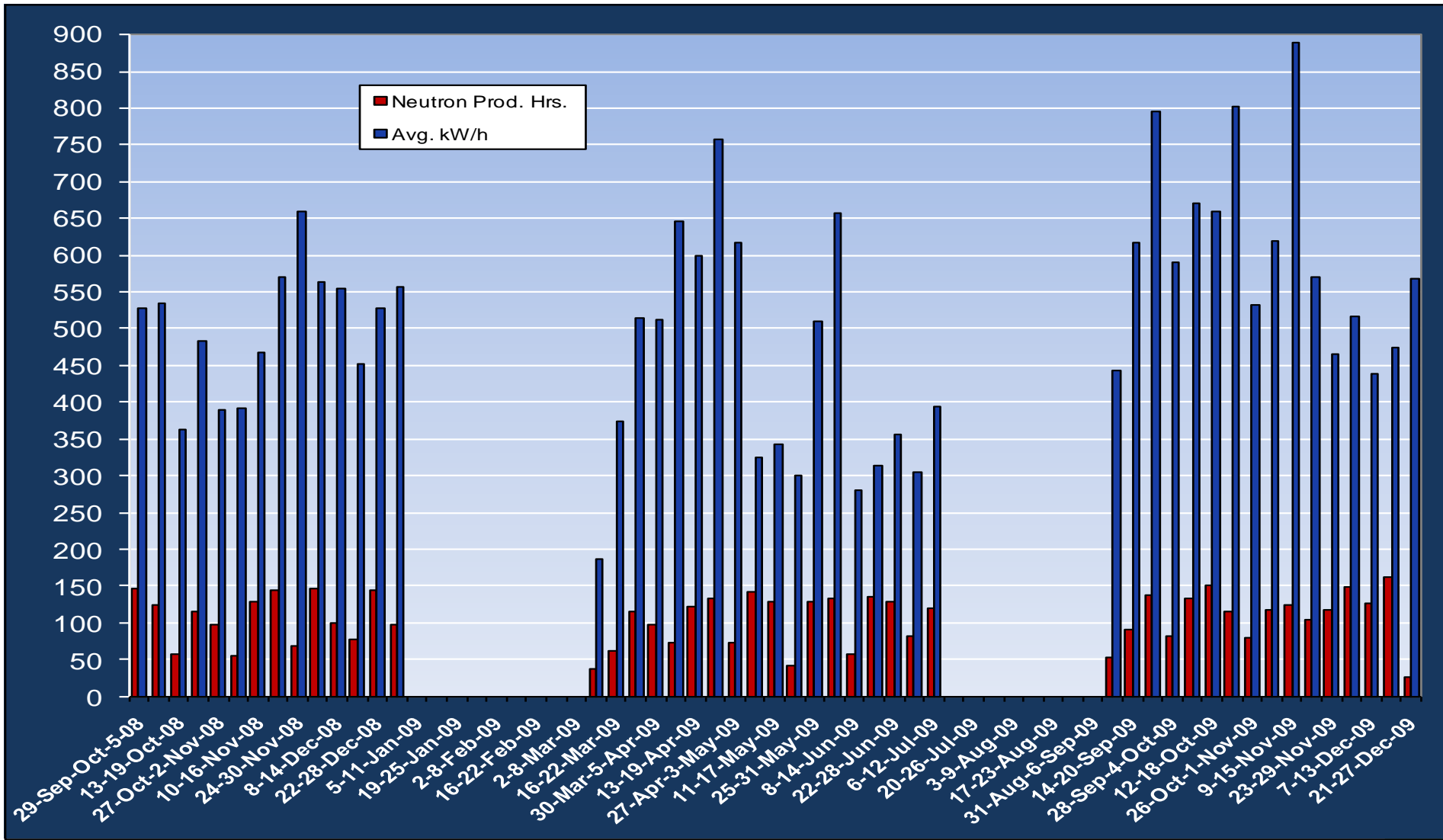


Internal Goal	1285.2
Commitment	1028.2
Actual	1036.3
Difference (actual-commitment)	8.1

- Ahead of the MW-hr commitment for FY10
- We were above the internal goal until we reduced the accelerator duty cycle



Beam Hours to Target & Avg. kW/hr for FY09 & FY10-1



- Average kW/hr by week has been increasing



Operations Organization and Staffing

- **Responsibilities – Safe, efficient, and effective operation of the SNS facility, including adherence to the Operational Envelope and Accelerator Safety Envelope**
- **Staffing of Central Control Room**
 - **Typical Beam Operation: Shift Supervisor, 2 Accelerator Specialists, Target Operations Shift Technician. Can include Accelerator Physicists, Machine Specialist, Facilities operators etc.**
 - **Required for Beam Operation: Shift Supervisor, Accelerator Specialist**
 - **Shutdown: One Operations personnel**
 - **Control Room Staff: 9 of 12 Shift Supervisors, 6 Accelerator Specialists, Accelerator Machine Specialist, 8 Target Operations Shift Technicians**
- **Staffing other Control Rooms**
 - **Central Helium Liquefier: Staffed 1-2 shifts per day**
 - **Central Utilities Building: Staffed day shift only M-F days**

Operations Training/Qualification

- **Accelerator Operations Training for:**
 - **New Hire** **Complete**
 - **Accelerator Specialist I** **Complete**
 - **Accelerator Specialist II** **Almost Complete**
 - **Shift Supervisor** **Under development**
 - **Mentor** **Conceptual**

Conclusions

- **For FY2009 and Run 2010-1**
 - **We have met our goals for:**
 - **Neutron Production Beam Availability**
 - **MW-Hrs delivered for Neutron Production**
 - **Neutron Production Hours delivered**
 - **Total Operating Hours**
 - **We have identified the systems which contribute the most to beam downtime and have an aggressive program to increase reliability in these and other areas.**