Summary - Resources

Fulvia Pilat, CAD

RHIC Retreat Close-Out, July 20 2009

R&D, Projects, Resources Session

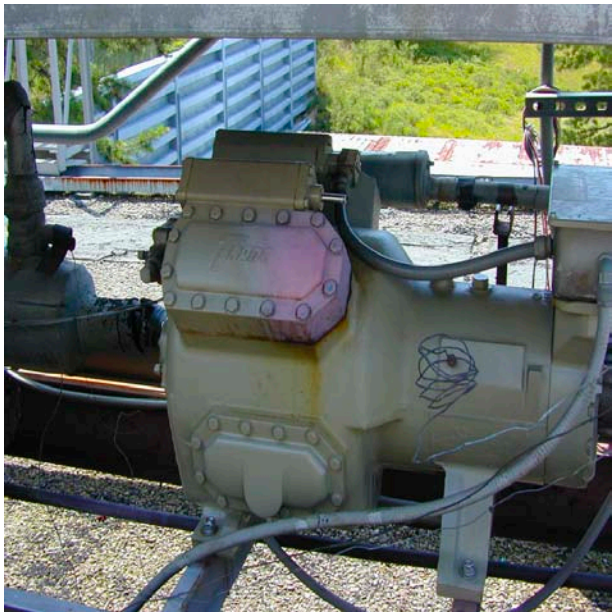
Organizers: F. Pilat, M. Minty

Chair: T. Roser

8:00	Raparia	EBIS	(20)
8:20	Blaskiewicz	Stochastic cooling project	(20)
8:40	Fischer	Electron lens project	(20)
9:00	Fedotov	Low energy cooling	(20)
9:20	Ben-Zvi	Superconducting RF program	(20)
9:40	Kayran	ERL program	(20)
10:00	Ptitsyn	MeRHIC, eRHIC	(20)
11:00	Pendzick	Infrastructures: AC, tunnel, experiments	(20)
11:20	Sandberg	Infrastructures: electrical. Resources	(20)
11:40	Tuozzolo	Infrastructure: buildings. Resources	(20)
12:00	Lamontagne	Funding and Finances	(20)

Facilities: STAR Chiller

- A new 50 ton chiller & 10 ton air handler will be added to improve AC in the IR



RHIC Service Building AC

- Permanent ducting will be added to:
- 1006b
- 1008b
- 1002a

PHENIX AC

- A new compressor / condenser unit will be installed for AC #3

H-10 Retaining wall repair

- Engineering & plan for the repair of the wall has begun.

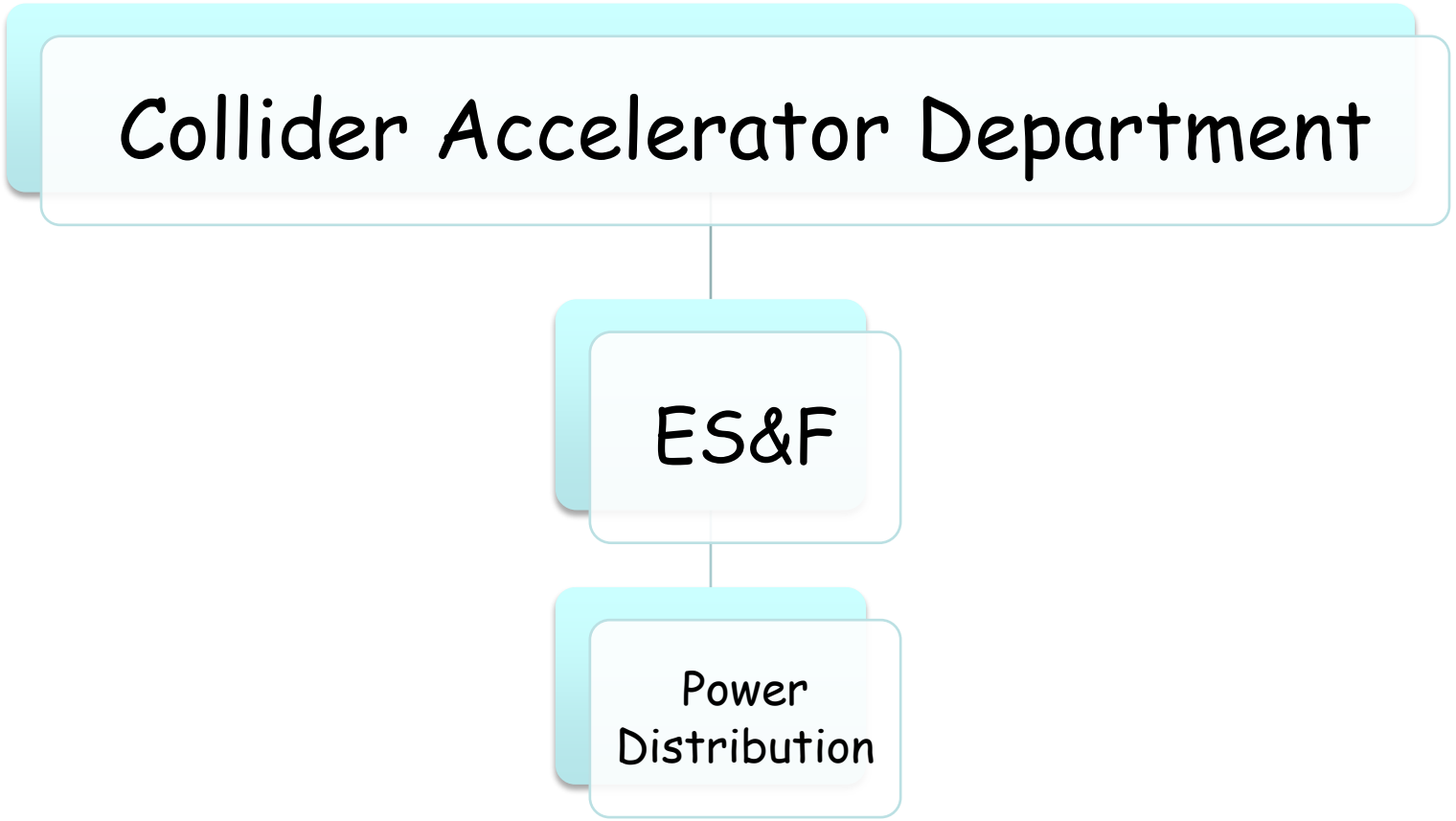
Repair of the g-2 cap

A contractor will be hired to repair the cracks in the concrete

And my favorite--

- Mikes trailer will be crushed ☺

→ Space charges


Collider Accelerator Department
ES&F
Power Distribution

124 Buildings

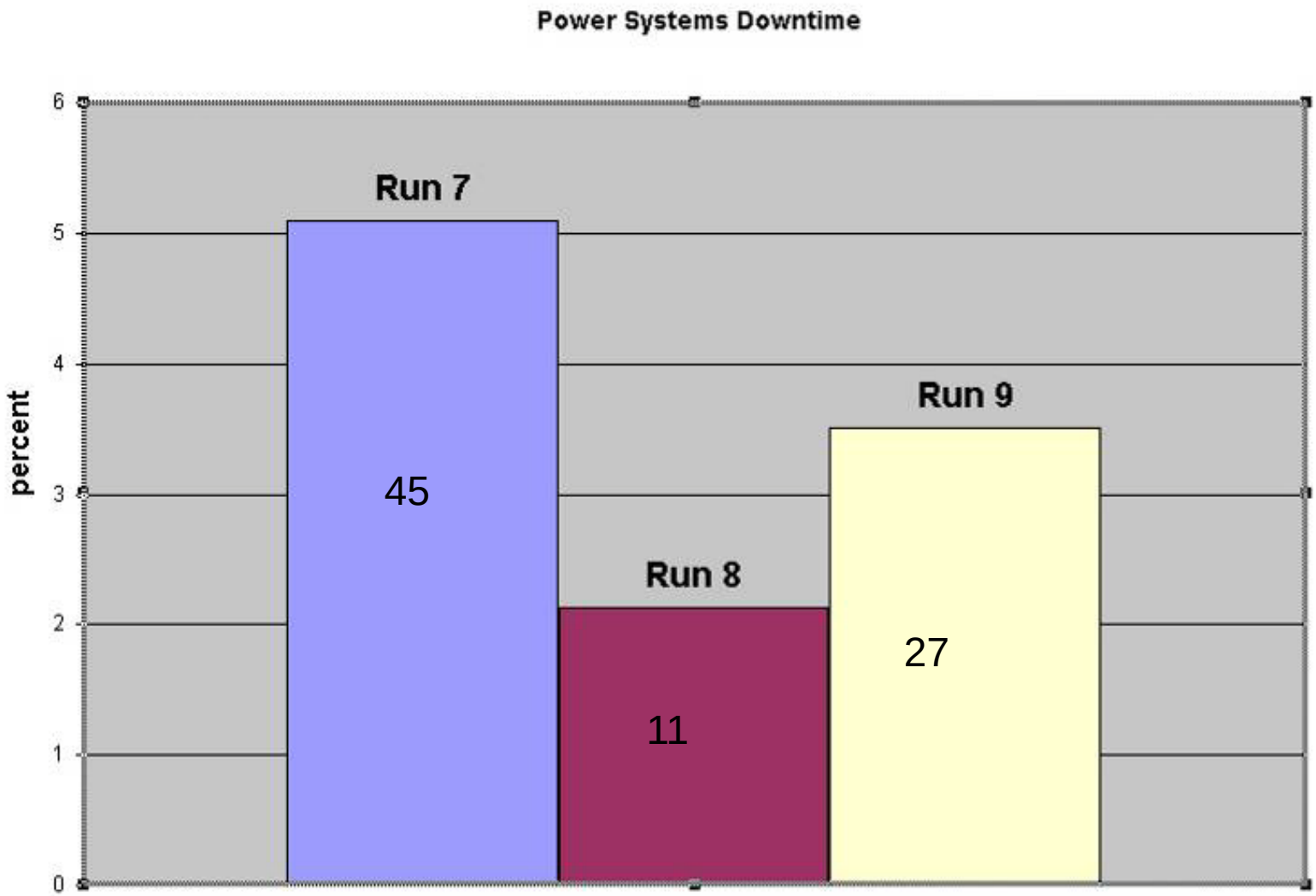
60 Substations

6000 high power switches at the 480 volt level

Much of this equipment is between **thirty** and **fifty** years old

Electrical Systems

C-AD



The most significant development affecting the C-AD power system is the understanding and mitigation of the dangers associated with **Electrical Arc Flash**

This danger was not properly recognized by the industry until the beginning of this decade.

It is estimated that arcing faults will send more than **2,000 workers** to burn centers this year.

C-AD

A conservative estimate is that C-AD has **spent $900,000** and **5 man-years** on the Arc Flash program over the last two years. The Laboratory has more than doubled this amount.

There is estimated to be **another years work at C-AD** to complete this project.

This is an **ongoing process** that must be constantly revisited as even small changes can have significant consequences.

The bottom line is that **a great deal of money and manpower has been spent on the Arc Flash program at C-AD** and that a lot more will be spent before the project is completed.

Very tangible safety improvements have been made and there is no question that our workers are safer because of this effort.

Electrical Systems-Completed

C-AD

Other electrical systems - completed

- 912A three new **400 kW generators**
- 13.8 kV Overhead Line Maintenance replaced 19 damaged insulators
- EBIS substation L4 in full service
- PHENIX 8S 1600A main switch board was replaced
- PHENIX AHU-3 duct heater circuit re-feed
- PHENIX HVAC MCC replaced with new unit
- PHENIX CMO power supply disconnect switch replaced
- 928 and 929 GE MCC Upstream breaker replaced
- 1000P pump room motor starters re-configured
- 1004B RHIC DIPOLE RAMP power supply
- 1004 B Quad Ramp power supply 800 A

Electrical systems – this summer

- **1004B high bay area lighting** will be added
- Over-duty **panel boards at PHENIX** high bay area to be replaced
- **LINAC L1 MCC**. Two water transport pump motor starters
- Substation A adding a **2000A main breaker**. That will drop the arc flash level from DANGEROUS to 2
- Replacing 928 basement **SIEMENS main 480V distribution** panel-board adding a main breaker.

Electrical Systems-Future Plans

C-AD

Add 1200A main breaker to 925 substation
Add 1200A main breaker for STAR CWS MCC
Add 800 main breaker for PHENIX CWS MCC
Add main breaker for Siemens exciter
Add load banks on 8 units for RHIC diesel generators
Replace batter chargers on RHIC diesel generators.
Remotely monitor batter conditions.
Add lighting to 929 pump room

Engineering resources - Infrastructure

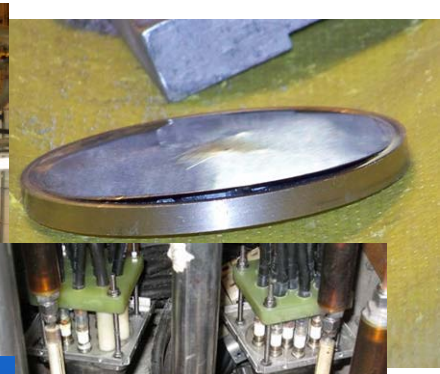
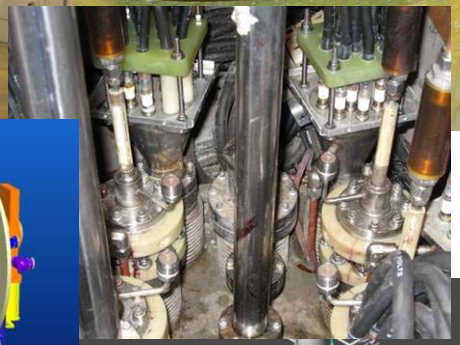
Mechanical Engineering Support

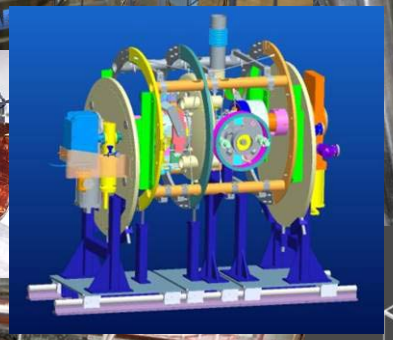
Shutdown and ongoing projects

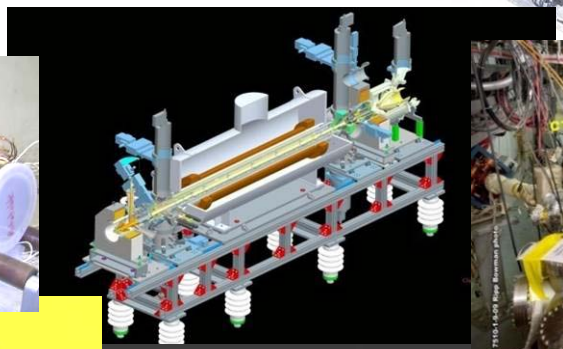
Mechanical Engineer Staff

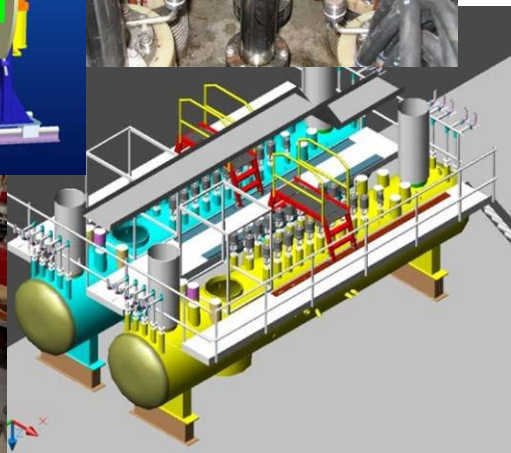
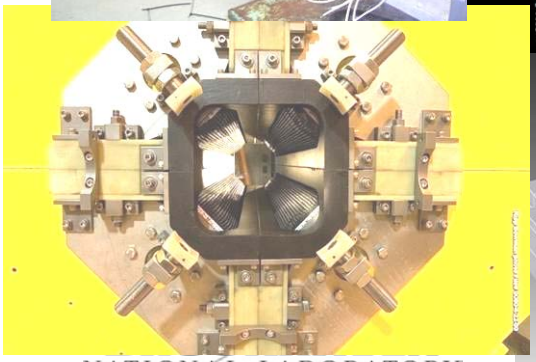
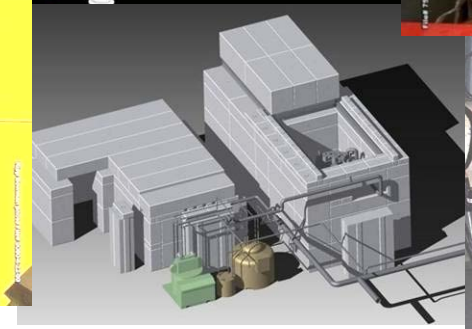
Design Room

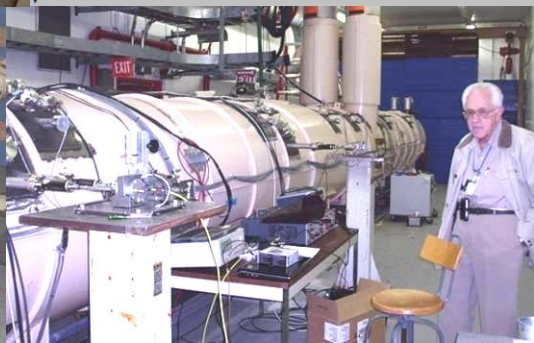
Building Program if time allows.





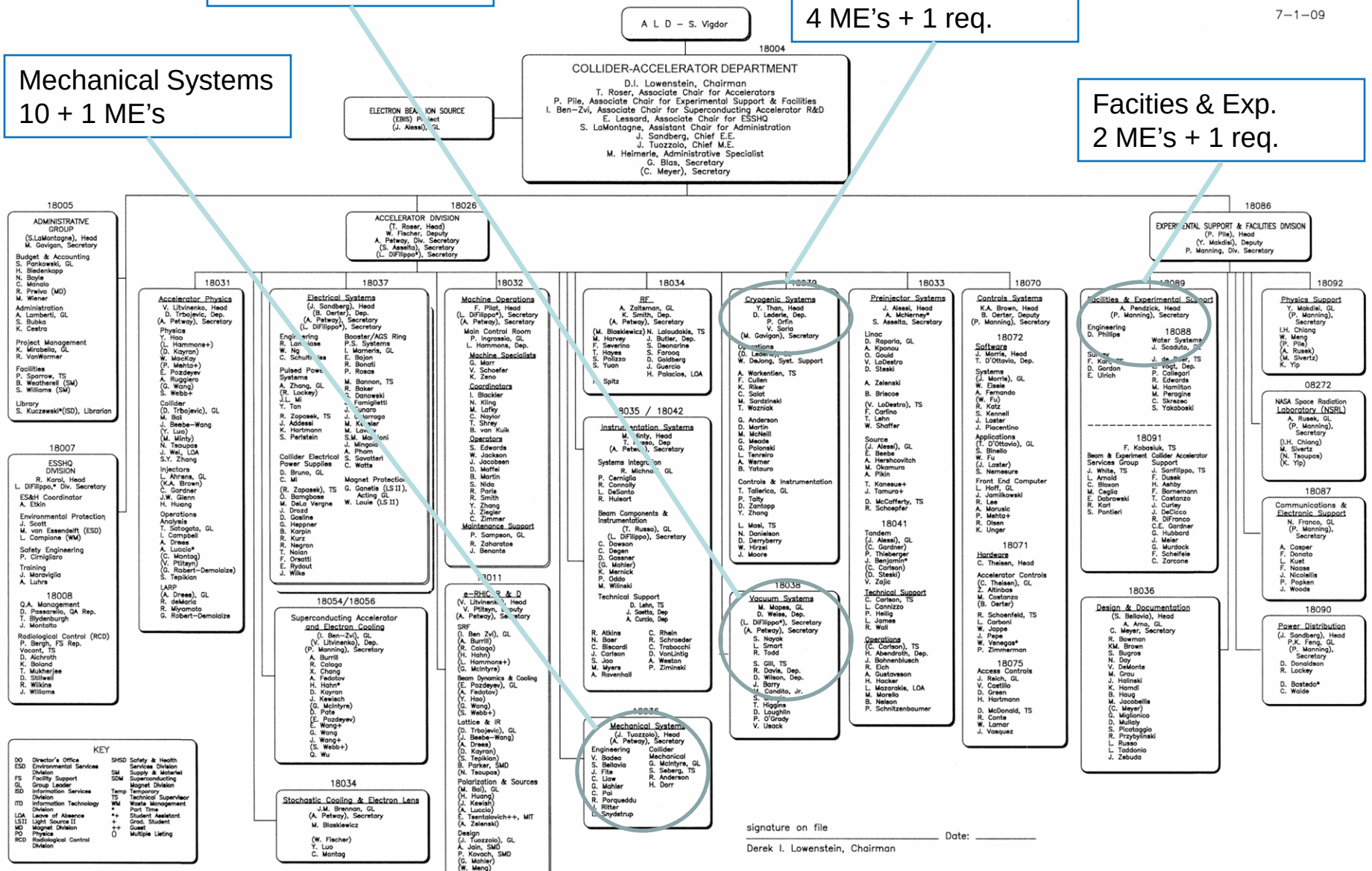


Vacuum Systems
4 ME's

Cryogenic Systems
4 ME's + 1 req.

Mechanical Systems
10 + 1 ME's

Facities & Exp.
2 ME's + 1 req.



	Totals	Scientific	Mechanical Eng.	Electrical Eng.	Information Tech	Mechanical Tech	Electrical Tech	Tech Support
Accelerator Physics	23	22			1			
Electrical Systems	40			12		2	26	
SC Accel	12	11						1
Stochastic Cooling	4	4						
Machine Operations	26	6						20
e-RHIC	0	borrowed labor						
RF	15			7			8	
Instrumentation	29	2		9	1	7	9	1
Mechanical Systems	13		10			2		1
Cryogenic Systems	27		4	2	2	14	5	
Vacuum Systems	15		4	1		8	1	1
Preinjector Systems	32	10		3		8	1	10
Control Systems	36	1		8	17		10	
Facilities and Experimental	35		2	1		16	15	1
Design	18					12	5	1
Physics Support	4	4						
NASA SRL	2	2						
Communications	8				8			
Power	5			3			2	
ESSHQ	16							
ADMIN	11							
	371	**62**	**20**	**46**	**29**	**69**	**82**	**36**

2009 Shutdown List

- LINAC/BLIP 200 MeV Laser Profile Monitor (Nayak, Bellavia)
- **LINAC/MEBT Further Upgrades for Raparia (Fite)**
- **Booster EBIS Dipole Bus Design and Installation (Pendzick)**
- AGS Replace L10 RF Cavity with Standard AGS Cavity (Weiss)
- **AGS Siemens Bearing Pedestal Repair/Replace, Transformer Heat XC Repair (Badea, Porqueddu)**
- **AGS Gold Beam Vacuum Chamber loss remediation (???)**
- RHIC High Current Power Lead Insulator, redesign, test, fab., install (Hamdi, Seberg)
- ***RHIC ODH Flow Calculation and Modeling (Than, Liaw)***
- ***RHIC ODH Release Rate and Vacuum Cryostat Pressure/Max Safe Pressure Calculations (Liaw)***
- **RHIC ODH 12 x 150 gas cooled lead repair, Ice Ball Heaters installation (Hamdi, Seberg, Heppner)**
- **RHIC ODH valve box helium deflection safety covers (Hamdi)**
- **RHIC ODH valve box vacuum relief valve – route to outside (Hamdi, Warkentien)**
- **RHIC Yellow Longitudinal Stochastic Cooler (original design) Move/Upgrade (Liaw)**
- **RHIC Transverse Stochastic Blue New Design and Location (Bellavia, Liaw)**
- **RHIC Ceramic Tube Longitudinal Pick-Up Design Yellow 2:00 (Brodowski).**
- **RHIC Upgrade old stochastic cooler feedthroughs to new design (Brodowski).**
- RHIC RF M. Brennan mystery projects (Brodowski, ???)
- RHIC Injection Kicker Saturating Inductors in Yellow (Pai)
- **RHIC IPM Upgrade (Fite)**
- **RHIC Spin Magnet Remove and Repair (McIntyre, Seberg, AM?)**
- RHIC Remove Phobos Magnet at 10:00 (Pendzick, Mapes)
- RHIC Triplet Vibration Compensation Magnet Design and Install (???)

2010 Shutdown List (Preliminary)

- LINAC/MEBT Further Upgrade for Polarized Protons (Fite)
- LINAC New PP Source AIP with Zelinski (Ritter)
- Booster – D3 Multi-wire, Repair or Remove Booster IPM (???)
- Booster – E3 Kicker Feedthrough ??? (Pai)
- AGS Westinghouse Power Supply Stator Winding Reinsulation (Badea, Porqueddu)
- AGS Sextupole Coil Replacement (Badea)
- AGS IPM Upgrade (RHIC style??)
- RHIC ATR Gas Stripping IPM??? (???)
- RHIC Move RF Common Cavities and Power Amplifier (Weiss)
- RHIC Dummy Cryostat cold stochastic cooler pickup (Soria)
- RHIC AC Dipoles and Spin Rotator Dipoles installation, yellow (Pai, Nayak, Scaduto)
- RHIC Old (Single) Polarimeter, reinstall as an IPM??? (Mahler/Bugros)
- RHIC ODH valve box electrical link box (Badea, Hamdi)
- RHIC Quad 6200 Amp co-axial bus link test and installation @10:00. (Liaw, Than)
- RHIC Collimator Upgrade (new scraper shape ??) (???)
- RHIC Old (Single) Polarimeter, reinstall as an IPM (???)
- RHIC 26 MHz Ferrite Tuner Fabricate, Assemble, Install (Brodowski)
- RHIC RF Reshape (stretch) Landau Cavities (Brodowski)
- New valve box walkways. (Hamdi)
- RHIC RF Power Tube Water Cooling Upgrade (Weiss)
- RHIC AC Dipoles and Spin Rotator Dipoles installation, blue upgrade (Pai, Nayak, Scaduto)

C-AD Projects – Ongoing

- EBIS Project (Snydstrup, Bellavia, Ritter, Mapes, Nayak . . .)
- EBIS SC Solenoid Spare (Tuozzolo, Snydstrup)
- BLIP Target Design and Support (Bellavia, Hock, New Hire)
- Update Stress Analysis on J10 dump. (Bellavia)
- DPIS/Laser Ion Source maintenance support (Ritter)
- Cryogenic Vertical Test Dewar Design and Installation. (McIntyre, Than, Porqueddu)
- ERL/VTF reliquifier plant installation. (Than, Lederle, Quimby, Porqueddu)
- Layout and schedule for e-cooling (McIntyre)
- ERL 5 cell cavity and e-gun testing (McIntyre, Weiss, Mahler, Pai, Than, Lederle, Quimby)
- ERL Gun to 5 cell test beam line (McIntyre, Mahler, Weiss)
- ERL Gun Cathode test facility (Mahler)
- ERL injection and dump line layout, ring installation. (McIntyre, Mahler, Fite, Weiss)
- RHIC Cryogenics Compressor Maintenance and Repair (Badea, Porqueddu)
- RHIC RF Testing Block house design and installation (Badea, Benante)
- RHIC RF Power Tube Water Cooling Upgrade (Weiss)
- RHIC 56 MHz SCRF Cavity and Power Feeds Design (McIntyre, Pai, Bellavia, Grau) - 2011
- RHIC e-Lens Project - 2011
- e-RHIC layout and preliminary design. (Mahler, Mapes, McIntyre, Tuozzolo,
- Building 924 Upgrade (Tuozzolo, Russo, Lehn, et al).
- C-AD building consolidation: 905, 912 storage, 918, ADS (Tuozzolo, et el).
- RHIC AC Dipoles and Spin Rotator Dipoles installation, blue (Pai, Nayak, Scaduto)

Design Room Assignments

Bowman – EBIS, ERL, Vertical Test Facility Layout

Bugros – Stochastic Cooling (Yellow Kicker), Blip Basket/Target (Hold)

DeMonte – Stochastic Cooling RF-Window & RF Feed-thru, Linear Collider (902), LEBT-magnet

Grau – 56 MHz RF Cavity, RF Feeds, & Dampers

Halinski – MEBT Quads & Coil Winding Fixture, Debuncher, EBIS Beam line Chambers

Hamdi - 12x150 PWR Leads, Valve Box lead heaters, insulators, and covers, VB Link Boxes

Miglionico – Stochastic Cooling (Blue kicker), checking

Picataggio – G5 Layout(RTR), ERL Z Line layout

Ritter – Checking Stochastic Cooling, Blue and Yellow

Russo – ERL Electron Gun/Cavity String Assembly Tooling/Fixture

Zebuda – CK 56Mhz Cavity

Summer Students – MeRHIC Layout and Magnet Design, ERL Condo Cooling

Backlog: Test e-gun magnets and chambers, ERL GT5 Injection Layout, ERL Z line layout, RHIC Common Cavity Installation 3:00, 9Mhz RHIC RF Cavity (as built), BLIP Laser Profile Monitor, RHIC Compensation Dipoles, electron lens project, 2010 Stochastic Cooling Cavities

ME Assignments

Badea	RHIC RF Testing Block house design and installation @ 4:00
Badea	Westinghouse PS Stator Winding Rework 2009
Badea	Seimens PS Pedastle No.3 rework
Badea	RHIC Cryogenic Compressor Vibration Study
Badea	RHIC Cryogenic Compressor Engineering Support
Badea	AGS Sextupole Magnet Upgrade
Badea	P Bank defective radiator removal, repaired and reassembled
Badea	4 o'clock Power supplies retrofitted with new Transf.(2 units)
Badea	Investigate and resolve Nitrogen leak on transformer F2
Badea	Siemens Motor Generator extended maintenance

Bellavia	Transverse Stochastic Cooler Blue New Hinged Design
Bellavia	BLIP Laser Profile Monitor - 200 MeV Design
Bellavia	56 MHz Cavity Power Coupler and Damper Design and Analysis
Bellavia	e-RHIC Lattice Analysis Support
Bellavia	EBIS Linac Drift Tube Design and Fabrication
Bellavia	EBIS Instrumentation Design and Fabrication
Bellavia	BLIP Beam Line Corrector Magnet Installation
Bellavia	BLIP Target Analysis and Support
Bellavia	BLIP Bolted Target Design and Fabrication
Bellavia	Design Room Group Leader, ANSYS Contract Co-ordinator
Bellavia	ANSYS Support Co-ordinator
Bellavia	Magnet Safety Inspection
Bellavia	Computer Aided Engineering Analysis
Bellavia	NSRL Beam Plug

Brodowski	Ceramic Pick-up for Stochastic Cooler Design
Brodowski	RHIC CERN RF Cavity Stretcher
Brodowski	Stochastic Cooler Feedthrough Engineering
Brodowski	26 MHz Tuner Assembly and Test
Brodowski	Linear Drive Stochastic Cooler Design
Brodowski	MEeRHIC Preliminary Engineering Design Layout
Brodowski	Latest Current Transformer Design
Brodowski	RF Group Engineering Support

Fite	RHIC IPM Upgrade
Fite	LINAC LEBT Line Reconfiguration (2009 update)
Fite	NSRL Beamline Support
Fite	NSRL Operatorless Access Hardware Installation
Fite	NSRL Incubator Modifications
Fite	ERL Beam Dump Line Lay out and Magnet Design
Fite	ERL 2 KG Solenoid Magnet design (Ring)
Fite	Tier I Safety Inspection Team Member

Hock	e-Lens Design and Installation

Liaw	pp2pp Roman Pot Window Selection Calculations
Liaw	RHIC Magnet Line ARC Flash Calculation
Liaw	RHIC Stochastic Cooler Yellow Longitudinal Upgrade 2:00
Liaw	RHIC Stochastic Cooler Blue Vertical 12:00
Liaw	RHIC Stochastic Cooling Blue Horizontal 12:00
Liaw	RHIC Stochastic Cooling Yellow Horizontal 3:00
Liaw	RHIC Vacuum Cryostat Pressure Safety Calculation
Liaw	Vertical Test Dewar Design and Safety Calculations
Liaw	AGS Pulsed Quadrupole Magnet Design and Installation
Liaw	EBIS Pulsed Power Supply Design, Thermal Analysis and Installation

Mahler	C-AD Polarimeters - Problem du Jour
Mahler	AGS IPM Upgrade - RHIC style IPM
Mahler	DAT Detector Design "Nano Boone"
Mahler	ERL Ring Magnet Design and Procurement
Mahler	Photocathod e-Gun Magnets and Vacuum Chambers
Mahler	MEeRHIC Preliminary Engineering Design Layout
Mahler	e-RHIC Prototype Magnet Design
Mahler	e-RHIC Prototype RF Cavity Design
Mahler	Atlas Detector Upgrade

ME Assignments

McIntyre	RHIC Liaison Mechanical Engineer
McIntyre	RHIC Space Allotment Coordinator
McIntyre	56 MHz Cavity Design and Schedule
McIntyre	Vertical Test Dewar Design and Schedule
McIntyre	ERL Lead Engineer
McIntyre	ERL 5 cell cavity design and fabrication
McIntyre	ERL e-gun engineering liaison
McIntyre	Spotlight Awards Committee Chairperson
McIntyre	Bargaining Unit Grievance Contact for C-AD
McIntyre	Triplet Magnet Vibration Mitigation
McIntyre	e-RHIC SCRF Cavity Lead Engineer

Nayak	EBIS Source Beam Line Design
Nayak	RHIC Blue and Yellow Spin Flipper Vacuuum and System Installati
Nayak	NSRL vacuum window
Nayak	EDM Experiment Design and Analysis Support
Nayak	BLIP LPM

Pai	RHIC AC Dipole/Spin Flipper Upgrade Project (Blue)
Pai	56 Mhz RF Cavity Design
Pai	56 Mhz RF Cavity Sensitivity and Field distribution Study
Pai	56 Mhz RF Cavity Tuner Design
Pai	ERL Gun Ansys Calculation Review
Pai	RHIC AC Dipole/Spin Flipper Upgrade Project (Yellow)
Pai	Injection Kicker PFN Upgrade/Bipolar Solid State Modulator
Pai	RHIC Abort Kicker Upgrade Support
Pai	RHIC Injection Kicker Upgrade and Repair
Pai	Computer Aided Engineering Analysis - Targets, vacuum chamber, etc.

Porqueddu	Vertical Test Dewar Shielding and Installation - Moving Cover
Porqueddu	VTD/ERL/LBH Cryogenic refigerator piping design & Installation
Porqueddu	Siemens/Westinghouse Power Supply System Support
Porqueddu	Siemens PS Motor Bearing Pedestal Rework/Replacement
Porqueddu	Siemens Radiator Repairs
Porqueddu	Westinghouse PS Stator Winding Rework 2009
Porqueddu	Westinghouse fan room repairs
Porqueddu	Vibration monitoring test equip. for rotating machinery. (Roger B.)
Porqueddu	RHIC Cryogenic Compressor Engineering Support
Porqueddu	Platforms for Cold Box 4 & 5 & Spider valve area
Porqueddu	AGS Magnet Covers
Porqueddu	RHIC Cryo 80K cooler piping modification analysis
Porqueddu	RHIC Cold Mass Storage System

Ritter	EBIS Liaison Engineering Support
Ritter	OPPIS Polarized Source Mechanical Engineering
Ritter	EBIS Dipole Magnet Design, Procure, Bus and Water Install
Ritter	EBIS Electron Gun Design and Procure
Ritter	EBIS Test System Mechanical Engineering
Ritter	EBIS Stands and Supports
Ritter	EBIS LEBT
Ritter	EBIS MEBT
Ritter	EBIS KOBRA Simulations
Ritter	EBIS External Sources and Injection
Ritter	LEBT High Intensity Proton Source Mechanical Engineering
Ritter	FABS - Fast Atomic Beam Source

ME Assignments

Snydstrup	EBIS Lead Engineer/Deputy Project Manager
Snydstrup	EBIS Ext. Ion Source Line (Layout, Switch Chbr, Quads, Instr,etc.)
Snydstrup	EBIS SC Solenoid Magnet Procurement and Installation
Snydstrup	EBIS SC Spare Solenoid Magnet Procurement Support
Snydstrup	EBIS IH-Linac Procurement and Installation
Snydstrup	EBIS RFQ Procurement and Installation
Snydstrup	Injector Systems (Tandem VDG) Liaison Mech Engineer
Snydstrup	EBIS RF Buncher Procurement and Installation support

Todd	RHIC Polarimeter Vacuum System Support
Todd	TiN coating, NEG coating
Todd	RHIC gas Jet
Todd	ERL clean room and particulate system
Todd	RHIC RF bakeout

Tuozzolo	RHIC Chief ME/Acc. Div. Mechanical System Group Leader
Tuozzolo	HR Liaison, Performance Appraisal and Salaries
Tuozzolo	ASSRC and ESSRC, BNL Pressure Safety
Tuozzolo	Space Committee, Equipment Storage, SPS
Tuozzolo	C-AD Building Consolidation Plan
Tuozzolo	Triplet Magnet Vibration Mitigation
Tuozzolo	EBIS SC Solenoid Magnet Spare Procurement
Tuozzolo	MeRHIC Design Engineering Support
Tuozzolo	RHIC e-lens Design Engineering Support

Weiss	L10 Cavity installation
Weiss	Move RHIC RF Common Cavities to 3:00
Weiss	ERL Vacuum Systems
Weiss	DX to D0 Roman Pots Layout and Design

Major initiatives:

EBIS

Stochastic Cooling

56 MHz

RHIC ODH issues

RHIC UG: IPM's, Triplets, RF, Kickers.

PP2PP, BLIP, LPM, PP Source, LEBT

NSRL

e-Lens

ERL

SCRF VTF

Maintenance: AGS PS, Cryo

ANSYS analysis support

New Projects: MeRHIC, e-cooling

Summary – Mechanical Engineering Staffing

- Another busy shutdown – but this year on a very **short schedule** with critical items (?).
- **Engineering support is typically underestimated** – EBIS & ERL the most recent examples.
- We are an R&D business building prototypes – **redesigns** are engineering intensive, schedules do not permit testing and development of design. (EBIS, stochastic cooling, spin flipper AC PS)
- **There are more people with great ideas than there are mechanical engineers and technicians to execute them**. (MeRHIC, e Lens, LEe-cooling, stochastic, etc.)
- All of the engineering and design staff are assigned to **multiple projects**.
- **Project management responsibilities** are further diluting the engineering availability.
- + Significant support from Lehn, Seberg, Pontieri, Benante, etc. and design room.
- More **documentation** for safety – lifting and pressure, training, reviews, forms etc.
- One new hire next week and 2 new requisitions will help if filled – back out for BLIP support.
- 2 contract engineers and 1 contract designer have helped as well.
- Still **need additional design room support and mechanical technician support** & **AC Czar**.
- And we haven't analyzed approaching **retirements** and possible **transfers**

C-AD Building Consolidation Program

With the completion of RHIC construction and the SNS project, C-AD has been on a long term building and staff consolidation program.

Goals:

- Return **underutilized buildings** to Laboratory for other use.
- Consolidate staff in and around **building 911**
- Abandon and Demolish of high maintenance and energy **inefficient buildings and trailers.**
- **Scrap obsolete equipment** and spare components and old production fixtures.
- **Secure valuable materials and equipment**.

C-AD Building Consolidation Program

Plan in Process to Abandon Older Buildings and Consolidate Staff.

- **Update building 912** for Technician Space and Equipment Storage

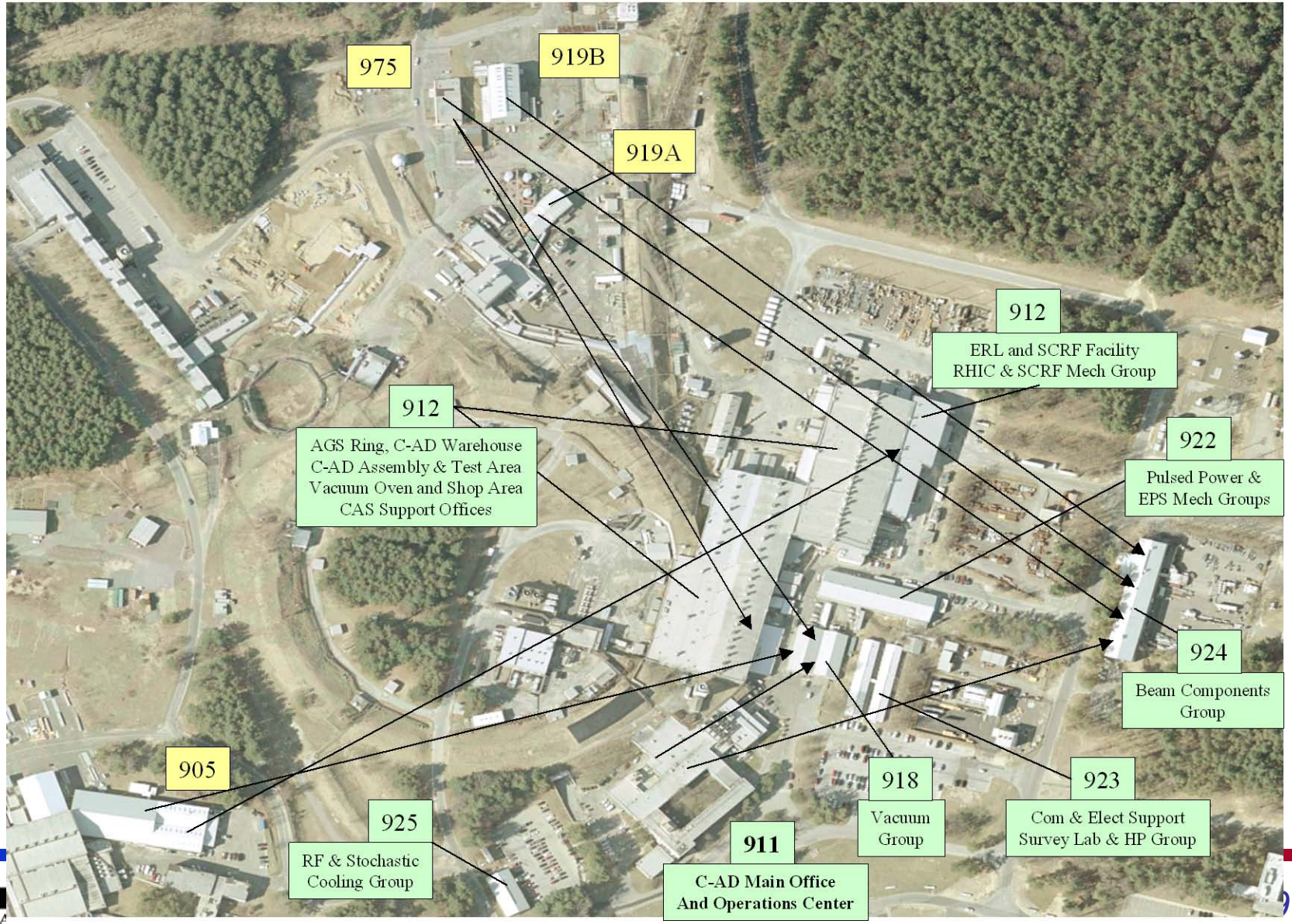
  Infrastructure in place: power, water, air, and cranes

  Infrastructure in place: Interior walkway with 911

  Infrastructure needs: roof repair underway, interior work areas

- **Convert building 918** to technician support shop area.
- **Update building 924** for mechanical and electronic technician shop.
- Abandon old tech shops & trailers in 919A, 919B, 919C and 975 (924)
- Abandon old tech shops and offices in 923 (eventually) to 911?.
- Abandon 905 area (924, 918, 912).

Consolidation Summary



Collider-Accelerator Department Financial Management for RHIC

July 17, 2009

Stephanie LaMontagne-McKeon

Outline

- The Optimal RHIC Program
- FY 2009 C-AD Funding Summary
- Organizational and Infrastructure Expenses
- RHIC Funding FY 2008 through FY 2011
- Financial Management Challenges
- The Employee's Role in Financial Management

The Optimal RHIC Program

- Annual Funding of **~$150M** provided by DOE Office of Science, Nuclear Physics Program Office
  - **$120M Operations and Experimental Support** (C-AD)
  - **$ 30M Detector Operations** (Physics Department)
- Machine operations of 30 weeks
  - Cool down of 2 – 3 weeks
  - Heavy Ions provided by the Tandem van de Graaff (~16 weeks)
  - Protons provided by the Linac (~12 Weeks)
- RHIC Manpower of ~**440** fte's
  - **C-AD at ~360** fte's
  - **Physics at ~80** fte's

Collider-Accelerator Department
FY 2009 Funding

(Dollars In Millions)

	Total	RHIC	EBIS	NSRL	Other
DOE Operating	117.4	116.4	0.3		0.7
DOE Equipment	2.3	2.3			
DOE Construction/AIP	12.6	10.2	2.4		
LDRD & Royalty	0.8	0.8			
WFO	1.2				1.2
Facility Users	6.4			4.8	1.6
Total FY 2009 Funding	140.7	129.7	2.7	4.8	3.5

Collider-Accelerator Department
FY RHIC Operations Budget

(FY 2009 Dollars in Millions)

	Direct Cost	Matl Handling Burden	Traditional Overhead	Common Support	Total Cost	Percent of Funds
Direct Labor	$44.5		$3.7	$13.9	$62.1	54%
Distributed Technical Services	5.0			1.6	6.6	6%
Purchases	5.4	0.4	0.5	1.8	8.2	7%
Special Procurements	4.0	0.3	0.0	0.1	4.5	4%
Machine Power	7.6				7.6	7%
Building Power	0.4				0.4	0%
HP Support & Instrument Calibration	1.1			0.3	1.4	1%
Vehicles	0.4			0.1	0.5	0%
Information Technology	2.5			0.8	3.3	3%
Waste Management	1.3			0.4	1.7	1%
Space	9.8		0.8	3.1	13.7	12%
Organizational Burden	4.0		0.3	1.2	5.6	5%
Total Org Burden and Fixed Expense	$86.0	$0.8	$5.3	$23.3	$115.4	100%

Collider-Accelerator Department
RHIC Operations Funding
FY 2004 through FY 2010

	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09 Allocated	FY 10 Presidential
Labor	37.8	40.1	39.4	41.8	42.5	44.5	46.9
Distributed Technical Services	3.6	3.4	3.7	4.5	4.2	5.0	5.2
M&S	8.3	8.2	11.6	10.8	9.6	8.9	9.5
Power	8.4	9.5	8.6	6.5	8.4	8.1	13.3
Allocated Costs	4.1	4.8	4.8	5.2	5.2	5.7	5.8
Space	6.4	7.1	8.1	8.9	9.6	9.8	10.5
Organizational Burden	2.9	3.0	2.9	3.7	3.6	4.0	4.2
Material Handling Burden	0.6	0.6	0.7	0.8	0.7	0.7	0.7
Overhead	22.4	23.9	24.3	26.5	26.3	28.7	30.2
Total Operating Cost	**$94.5**	**$100.6**	**$104.1**	**$108.7**	**$110.1**	**$115.4**	**$126.3**
Stony Brook Foundation			-$11.2				
Power Rebate	-$1.0		-$0.6		-$1.5		
Prior Year Carry Forward						-$1.5	-$3.0
Carry Forward					$1.5	$3.0	$3.0
Total NP Budget Authority	**$93.5**	**$100.6**	**$92.3**	**$108.7**	**$110.1**	**$116.9**	**$126.3**
Cryo Weeks of Operations	**26.7**	**31.4**	**21.2**	**18.4**	**19.2**	**22.0**	**30.0**

Financial Management Challenges

- A Traditional List
  - Budget Uncertainties
  - Funding Delays
  - Limited Funding
  - Unfunded Mandates
  - Volatility of critical commodities
  - Critical component failures
- Thru the RHIC Lens
  - Infrastructure Support Costs
  - Incremental Cost of Operations
  - Schedule Window
  - Volatile power cost
  - Long lead procurements
  - Managing parallel efforts

Financial Management Challenges

- Long-term cost saving measures
  - Machine improvements to reduce operating cost
    - Cryogenic Systems Upgrades
  - Facility Upgrades to reduce operating costs
    - MCR Consolidation
  - Reduce fixed expenses
    - Return unused space
- Short-term cost saving options
  - Abbreviate experimental program
  - Delay new and replacement hires
  - Voluntary and involuntary Reductions in Force
  - Slow Waste Stream
  - Monitor and control power consumption when idle
  - Constrain credit card purchases and travel
  - Delay purchases

Collider-Accelerator Department Your Financial Responsibility

- Time Card Entry
  - Record all paid leave usage
  - Charge effort appropriately to ancillary programs
  - Minimize overtime
- Purchases
  - Prepare an **annual procurement plan**
  - Flag large unanticipated procurements
  - Charge purchases appropriately to ancillary programs
  - Bundle purchases
  - Correctly categorize purchases
- Reporting
  - Review monthly transaction reports

    Labor hours
    Credit Cards
    Stores Issues
    Open Requisitions and Commitments
    Maximo

Collider-Accelerator Department Financial Management Summary

- Departmental funding is finite
- A relatively small percentage of the overall funding for the Department is available for purchased materials and services
- An **annual procurement plan** will help to ensure that funds are available for the highest priority purchases

Resources: summary

Infrastructure

- Need for **infrastructure upgrade** (priority **AC**)
- **Electrical infrastructure upgrade** ongoing and planned
- **Building consolidation**: for functionality, minimize space charge

Engineering/technical support

- Staggering amount of work to support operations, R&D and future projects
- **Engineering personnel** well managed (matrix) but **insufficient**
- **Mechanical engineers** generally needed
- **Selective electrical engineers** needed

Examples: **PS group:** support Don Bruno and PS maintenance

ACS group: ACS system upgrade funded but stalled

Financial Management

- Sound financial operations in CAD
- Adequate funding essential