

Vision for the Accelerator Division

Andrew Hutton

Safety

Division Safety Officer

- I have asked **Phil Mutton** to be the Division Safety Officer
 - Effective start date has not been decided
 - Phil has a lot of experience in the Test Lab and from his previous positions
 - Phil will be responsible for all of the DSO functions, especially interactions with EHS&Q (10 CFR 851)



DSO (Continued)

- **Julian Gordon** will be responsible for the Test Lab Facilities



Tina Menefee will continue as DSO Assistant with responsibility for the Safety Warden Program

I will continue to be heavily involved in safety

Long-Term Vision

Introduction

- **Initially, JLab was a laboratory with a single program with everyone focused on the same goal**
 - **The FEL program brought complications as well as benefits, but the FEL program was a rather small addition, so interferences were relatively minor**
 - **The growing Work-for-Others portfolio (SNS and now ILC) complicated the situation further**
- **This is nothing compared to what we face today with the approval of the 12 GeV Upgrade**
- **The Accelerator Division needs to become more agile to be able to respond to multiple programs**

Everything starts with clear priorities

Priorities

- **The Accelerator Division has four main responsibilities:**
 - **Providing support to the 12 GeV project (highest priority)**
 - **Operating CEBAF to deliver the 6 GeV Nuclear Physics program**
 - **Position JLab for a future beyond 12 GeV**
 - **Carrying out R&D projects**
 - **Education**
 - **Performing work for others when it is in the best interests of the lab**

Meaning of Priority

- **Priority means that the 12 GeV program needs the most experienced people in the lab and must have the resources necessary to succeed**
- **But the 6 GeV program must receive enough support to ensure acceptable performance to maintain our User base**
- **Other priorities must also be addressed**
 - **This will provide many opportunities for more junior members of the staff to assume greater responsibility**
 - **In many cases, this will mean that a technician must carry out tasks previously assigned to an engineer**

**We have really good people at all levels,
Everyone will have a chance to shine!**

Providing support to the 12 GeV project (top priority)

- Support for the 12 GeV Upgrade project will be provided by every Group in the Accelerator Division
- Support is led by:
 - **Integration Engineer**
 - Steve Suhring
 - **Three 12 GeV APMs**
 - Joe Preble
 - Mike Spata
 - Karen White
 - **Accelerator Design**
 - CASA

12 GeV Support

- **The Accelerator Division has primary responsibility for the following areas, heavily supported by Engineering:**
 - **Developing and producing ten 100 MV cryomodules**
 - **Designing the beam optics and evaluating all other accelerator physics aspects**
 - **Designing and delivering the instrumentation and controls systems**
 - **Designing the beam separation systems**
 - **Preparing for accelerator commissioning**
- **The Accelerator Division also provides support in other areas**
 - **Many of the improvements for the “6 GeV hardening” program will also benefit the 12 GeV Upgrade**

Deliver the 6 GeV Nuclear Physics program

- **JLab Operations has a world-leading program**
- **Systems and protocols to structure operations**
 - **These systems enabled the Department to function impeccably with reduced involvement of senior Group Leaders who are now leading the 12 GeV Upgrade**
 - **Mike Spata, Steve Suhring, and Karen White**
 - **Leadership is now provided by previous Deputy Group Leaders**

Demonstrates that it is possible to continue the 6 GeV program at a high level with more junior staff

“6 GeV Hardening”

- **The 12 GeV User program will require:**
 - **12 GeV Project must be completed successfully**
 - **Underlying CEBAF accelerator must be able to supply 6 GeV beams with high reliability - “6 GeV hardening”**
- **“6 GeV hardening program” involves multi-year projects that will have to be re-prioritized annually depending on the budget and lab resources available**
- **Accelerator Division will direct this program**
 - **Relies on resources from other Divisions:**
 - **Engineering**
 - **Facilities**

6 GeV Hardening Projects

- Refurbish cryomodules (the C50 program)
 - **Joe Preble, Accelerator**
- Purchase new RF sources (klystrons or IOTs), rebuild old klystrons when it is economically viable, upgrade the HPAs for higher power
 - **Rick Nelson, Engineering; Jay Benesch, CASA**
- Replace older equipment to improve maintainability or reliability, creating underpinnings for 12 GeV Upgrade
 - **Will Oren, Engineering**
- Aggressive preventive maintenance on older electronic equipment (e.g. replacement of corroded connectors)
 - **Ron Lauzé, Engineering; Steve Suhring, Accelerator**

Controls Software

- **Vision for an integrated Control System**
 - **Every parameter derived from Experimental requirements in a hierarchy**
 - **Each parameter exists in only one place**
 - **Database – driven**
 - **I am convinced that Control Systems will be structured like this in the future**
 - **Our Controls Group will be in the forefront**

Leaders – Matt Bickley, Chris Slominski

Operations

- **Our Operations are world-class**
 - **Control Room is admired world-wide**
 - **Proposed and managed by Mike Spata, Tom Oren**
- **Challenges**
 - **Improve retention**
 - **Focus on training**



Position JLab for a future beyond 12 GeV

- **Accelerator Division contains the core competencies in accelerator science and technology**
 - **Accelerator Physics (CASA) led by Lia Merminga**
 - **SRF (SRF Institute) led by Bob Rimmer**
 - **Cryogenics R&D led by Dana Arenius and Rao Ganni**
 - **Matrixed from Engineering**
 - **Source Group led by Matt Poelker**
- **The FEL Division will also be tightly coupled**
- **These core competencies define JLab accelerator science**
 - **High current, CW, superconducting, multi-pass linacs**
 - **This explicitly includes energy recovery linacs**

ELectron Ion Collider (ELIC)

- **The top choice for a future facility at JLab is ELIC**
 - **Slava Derbenev, and others from CASA and Physics (Rolf Ent) have been studying this option and made a convincing case to the Nuclear Science Advisory Committee (NSAC)**
- **We are currently seeking R&D funding**
 - **R&D would include accelerator physicists, scientists and engineers in CASA, SRF, cryogenics and injectors**
- **In about three years, we would seek funding for a detailed engineering study of a machine designed for the JLab site**
 - **Assure construction funding for 12 GeV Upgrade first**
 - **This would enable JLab to seek funds for a ~two-year study to be ready for the next DOE long-range plan**

Other Options

The Accelerator Division may look into other options for:

- **On-site facility**
 - **25 GeV CEBAF**
 - **A positron option for CEBAF**
 - **Some preliminary studies have been carried out as part of the ELIC Project**
 - **An FEL User Facility**
 - **An ERL-based synchrotron light source**
- **We may provide support for facilities at other sites**
 - **Small version of the Radioactive Ion Accelerator (RIA)**
 - **Synchrotron Light sources (APS, ALS, 4GLS, Cornell)**
 - **ERL for Electron Cooling (RHIC)**

Work For Others (WFO)

- **Should enhance the capabilities of our core competencies and enhance our international visibility**
 - **True for FEL and SNS projects**
 - **Also true for most ILC R&D**
- **Also provides additional funding to keep critical staff**
 - **WFO has saved many jobs over the last few years**
- **Will take a long, hard look at WFO**
 - **Focus on areas which enhance our ability to carry out the primary missions of the laboratory**

Short-Term Program

12 GeV Deliverables in FY07

- **Support CD-2 before September 2007**
 - **Finalize the beam optics and component layout**
 - **Completion of the quarter-cryomodule demonstrating the performance required for the Upgrade cryomodules**
 - **Multiple other smaller R&D deliverables**
 - **Contribute to CD-2 documentation packages**
 - **Two Reviews**
 - **“Lehman” Review in June 2007**
 - **External Independent Review (EIR) in August 2007**

**This timetable keeps us on track to receive
12 GeV construction funding in FY09**

6 GeV Deliverables in FY07

- **Operate the published CEBAF schedule through June 28**
 - **Cease operations for the rest of the fiscal year**
- **During the Downtime**
 - **Warm up the linacs to 4K (not room temperature)**
- **Carry out maintenance safely and efficiently**
 - **Thanks to everyone who spent so much time and effort creating the list of maintenance tasks**
 - **Everything on the list that cannot be done this year will have to be done before 12 GeV comes on line**
- **Operations for Physics will resume October 1**
 - **There will be a six-week down January/February 2008 to install and commission C50 cryomodules**

5.75 GeV and 6 GeV

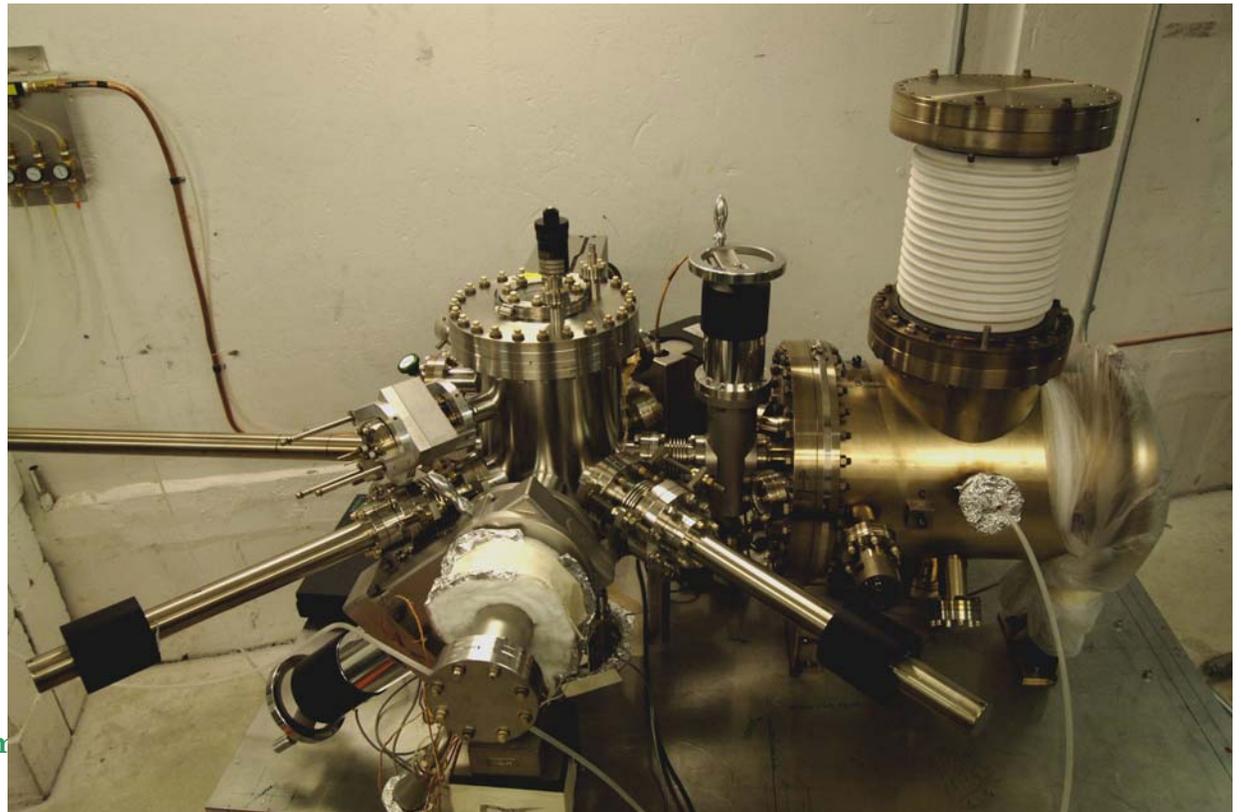
- **Reach 5.75 GeV by February 2008**
 - **Install Renaissance and 5 C50 cryomodules**
- **Reach 6.0 GeV by October 2008**
 - **Install 2 more C50 cryomodules**

- **This is a highly visible program, gets a lot of attention**
 - **Great start**
 - **Keep it up!**

6 GeV Deliverables in FY08 and Beyond

- Operate the accelerator for the experimental program
- Some experiments have new, harder beam specifications
 - Q_{weak} requires beam current of $200\mu\text{A}$ with better parity specifications than ever achieved
 - Beam tests will start at the end of March
- Load-Lock Gun
 - To be installed in July

Goal is Happy Users!



Director of Operations

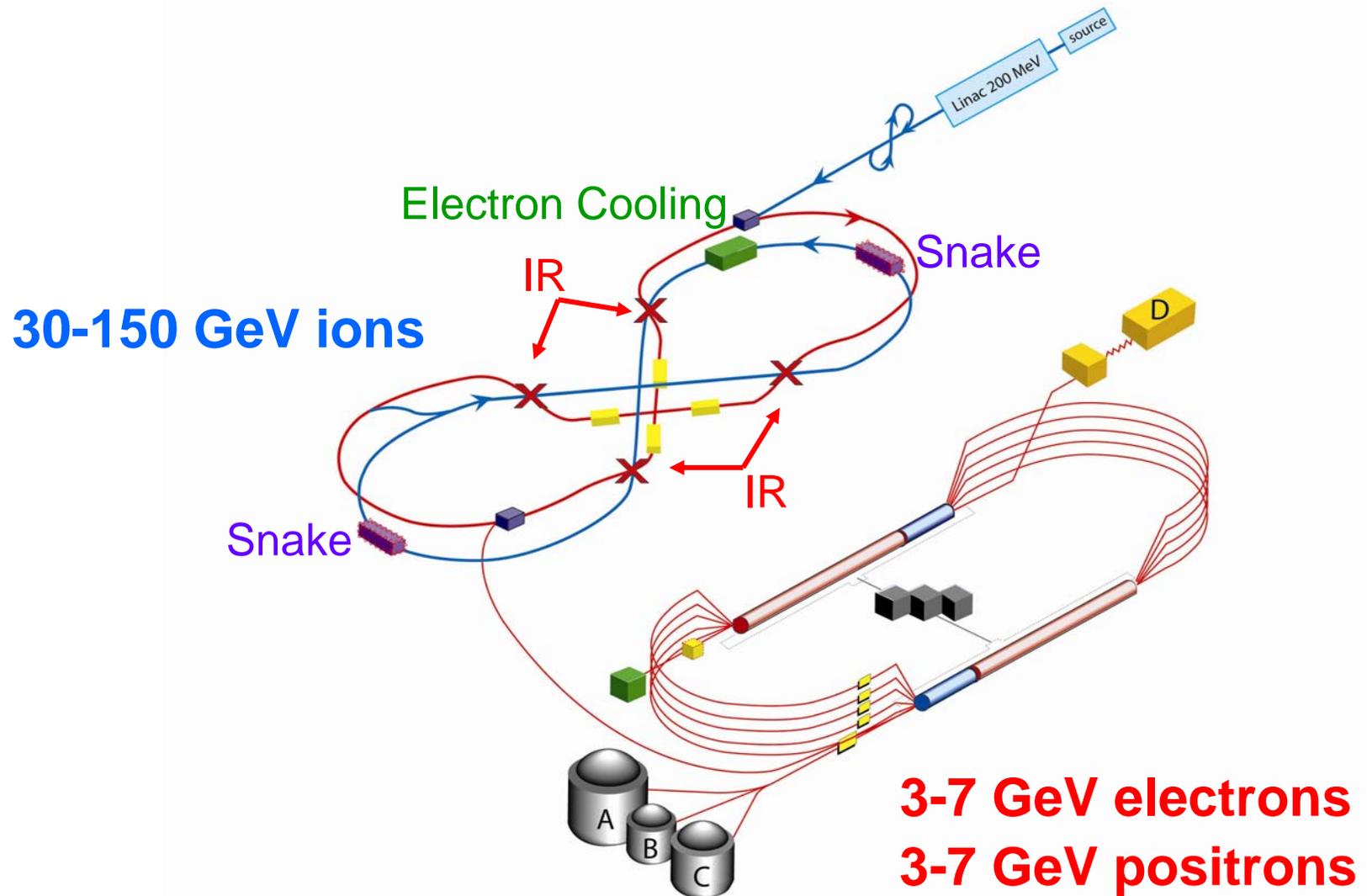
- I have held the position of Director of Operations and Operations Department Head for 14 years
- This position has been advertised
- The successful candidate will:
 - Understand the importance of the **people** who make the accelerator function
 - Understand the accelerator
 - Understand the technologies required to make the accelerator function
 - Understand the importance of process and procedures

Filling this position is my top priority

ELIC

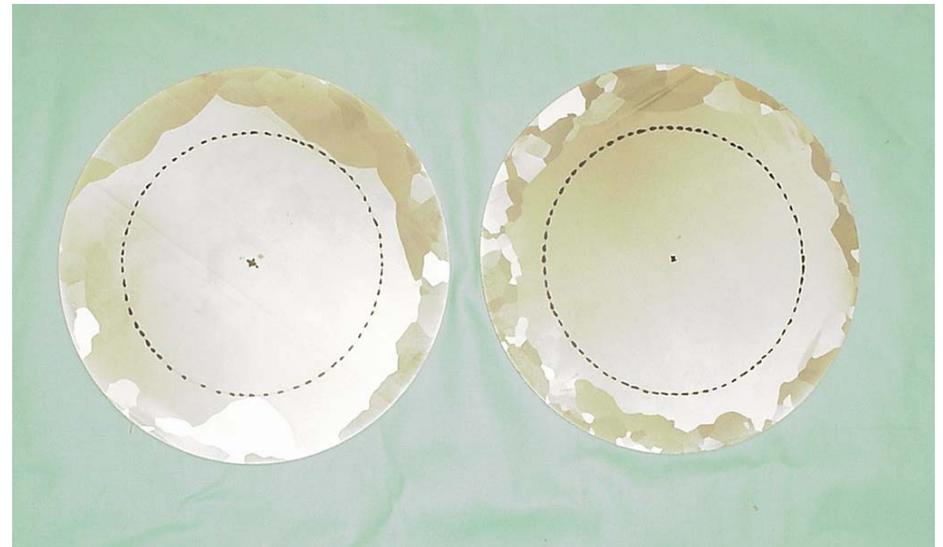
- A ZDR (Zero-order Design Report) will be written by Fall
- CASA (Lia Meringa, Slava Derbenev et al) leading the effort
 - Many Groups in Accelerator and Engineering assisting
 - Matt Poelker, Joe Grames, Reza Kazimi - source/injector,
 - Bob Rimmer and Haipeng - crab cavities
 - John Musson - kicker design
- An R&D List has been submitted to DOE (they asked for it)
 - Requested \$2.5M per year for five years starting FY09
 - Hope that DOE will provide funding

ELIC



SRF R&D

- **Continue studies of:**
 - **High gradient ILC 9-cell cavities, 42 MV/m is present record**
 - **Large grain/single crystal niobium studies 45MV/m for single cell**



Test Lab Rehabilitation Project

- **Project includes:**
 - **Building a 25,000 sq ft Butler building Annex**
 - **Personnel and production facilities**
 - **Gut the existing Test Lab open areas**
 - **Rebuild the open areas with more rational organization**
 - **SRF Personnel need to be actively involved in design**
- **Could begin as early as FY09**
 - **Total Project Cost \$21-25 M**
 - **Need CD-1 by September 2007 (includes external review)**

Responsible – Facilities Management

First Division Initiative

Centralized Computer Purchasing

Centralized Computer Purchasing

- All JLab computer purchases must be approved by CIO
 - I want to streamline this approval by coordinating Accelerator Division computer purchases
 - David Bliss has done this for Operations, CASA, etc.
- I have asked him to do this for the Accelerator Division

David Bliss X6202

dbliss@jlab.org

Back-up

Anthony Cuffe X6213

cuffe@jlab.org



Purchasing a Computer

Get approval from your Group Leader

- Contact David Bliss at dbliss@jlab.org, or better, file an ACE-PR from the main CEBAF logbook
 - Include the following in the request:
 - Purchase project and organization codes
 - State if the computer is a replacement
 - Briefly describe what the computer will be used for
 - Any specific needs if they are known
 - If a monitor is needed (19" flat panel is our standard)
- If you are unsure of your needs, ask David for advice
David will expedite the CIO approval process, purchase the computer, deliver it, and set it up for you!

Second Division Initiative

Preparing For Reviews

Preparing For Reviews

- **Every July, there is a Science and Technology Review**
- **We know what we have to present**
 - **Many of you provide input**
 - **Start it early – monthly meetings from now**

Responsible – Sherry Thomas

- **Every February, there is a budget review**
 - **We present estimated performance with different budget levels**
 - **Incorporate into the Division budget process**
 - **Start it early**

Responsible – Karen White

Third Division Initiative

Test Lab Clean-Up

Test Lab Conditions

- Working conditions in the Test Lab are **unacceptable**
- Too much stuff, nowhere to put it
 - There have been many recent improvements
 - Additional lighting in the module staging area
 - Many rooms cleared
 - Some rooms painted
 - Second floor offices re-carpeted
 - Good start – not enough
- The Test Lab will be cleaned up by April 21 (Open House)
Responsible – Bob Rimmer

Facility Upgrades for the Test Lab

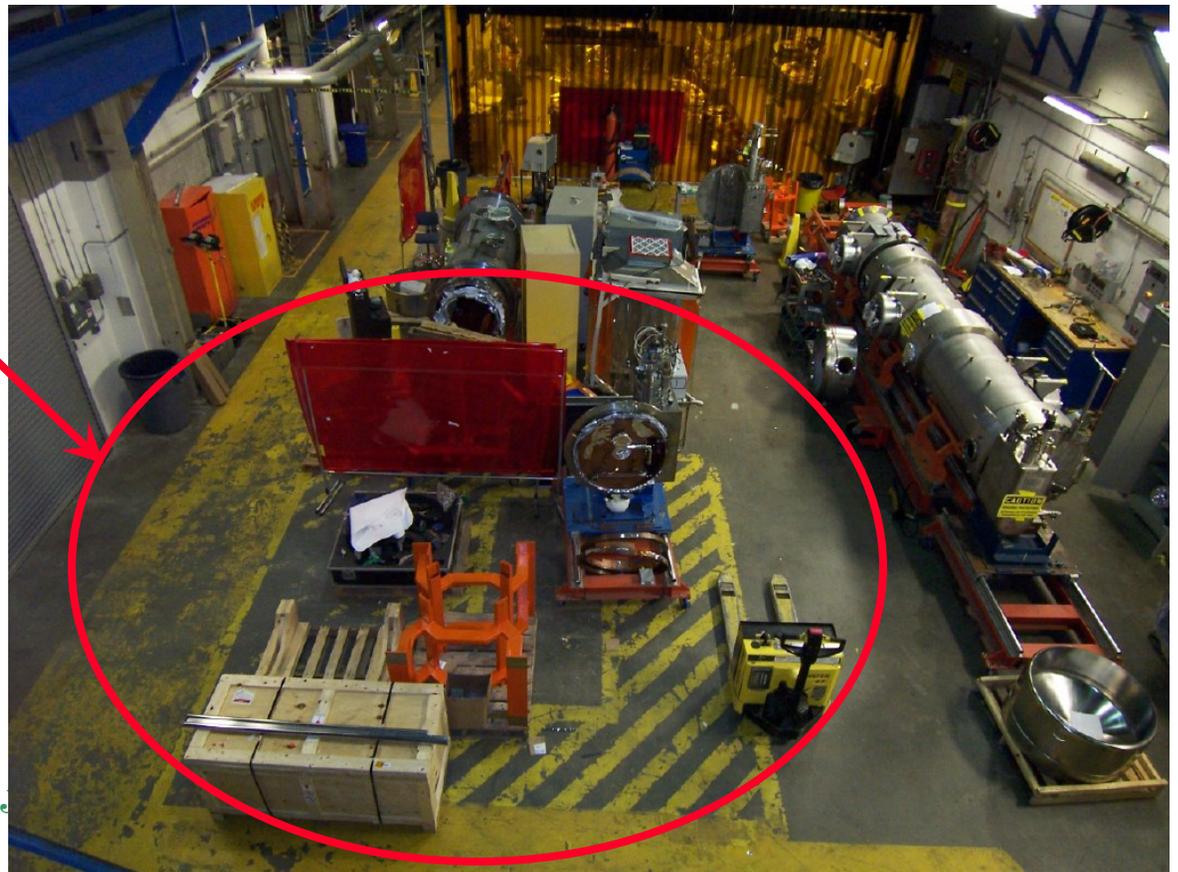
- New paint and carpeting in the 2nd floor corridors
 - New paint and carpeting in the conference room
 - New paint and flooring in the Atrium
 - Washrooms painted
 - Yellow Brick Road painted
 - Some walls in open areas painted to increase brightness
- Promised completion date – April 20**
- Lighting upgrades in open areas (may not be completed)

Responsible – Keith Royston
Facilities Management

Test Lab Clean-up

- **Changes in delivery patterns:**
 - **The module staging area must not be used for routine deliveries (modules excepted)**
 - **Transit is permitted, if no better way exists**

No storage



Deliveries

- Routine deliveries will be routed to the cryo-unit refurbishment room at the back of the building
 - Shelving must be cleared of long-term storage items
 - Transfer to EEL mezzanine



Yellow Brick Road



- The Yellow Brick Road must be kept clear
 - In some places, cabinets are encroaching on it
- Use electric delivery cart to facilitate distribution of smaller items throughout the building

Storage

- Existing “storage” areas will be cleared
 - Equipment should be separated into
 - Needs temperature controlled storage nearby
 - Needs temperature controlled storage
 - Needs storage nearby
 - Needs storage
- Transfer to:
 - EEL Mezzanine
 - Offsite Storage (not nailed down yet)
 - Transportainers (more will be made available if needed)

Storage Equipment

- 30 new cabinets have been ordered
 - Delivery due April ??



Elimination

- Anything you don't need should be eliminated
 - Recycled (preferable)
 - Removal will be arranged
 - Excessed
 - Help with paperwork will be provided
 - Thrown out
 - Dumpsters will be provided



Your Contribution

- I want every person who works in the Test Lab to participate in cleaning up the building
 - Organizer – Bob Rimmer
 - **No excuses**
 - “I never go there”
 - “I am a scientist (or engineer), its beneath me”
 - “We tried to do this before and it never worked”

Just Do It!

Taxation (with Representation)

- For FY07, I am taxing the SRF Institute 2½% of the procurement budget to improve the infrastructure
 - Send ideas and requests to
justdoit@jlab.org
 - Bob Rimmer and I will judge the best use of the money
- Proposals should be
 - “I would like to”
- Not
 - “Someone should”
- After April 21, every Group is taxed 2½% of their effort

Spend 1 hour per week cleaning up!

Next Accelerator Division Meeting

Thursday April 26, 10:30

- **Agenda**
 - **Safety**
 - **Report on Computer Purchasing**
 - **Report on Test Lab Clean-Up (with pictures)**
 - **Division Organization**

Excellence is not a skill,

it is an attitude