

# Accelerator and Engineering All Hands Meeting January 22, 2008

Andrew Hutton

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# SAFETY MINUTE

# Example of Job Planning

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- You are driving in a city with sidewalks
- You will turn right at the next intersection
  - Two-way traffic on both streets
  - No traffic lights or stop signs
- Let us go through the steps that you will take

# Preparation

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- Look in the rear-view mirror
- Switch on turn indicator
- Start to brake, aiming at a smooth reduction in speed
- If you have a manual gearbox, change down
- Look around, left to right, ending looking towards corner

# Action

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- Turn steering wheel to right by threading through hands
- Cover brake with right foot
- Continue to look at, and around, corner
- Center steering wheel by threading through hands
- Accelerate deliberately when wheels are straight

# Different Conditions

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- If you are in a rural setting, do you change the procedure?
  - No - decisions take too long
  - Always do every step
- Remember stress increases the likelihood of an accident
  - **Best defense – always rigorously follow the best practice until it is second nature and you do it automatically**
- Let us evaluate the reasons behind each step

# Preparation

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- **Look in the rear-view mirror**
  - **Be aware of who is around you before any action**
- **Switch on turn indicator**
  - **Inform others of impending action**
- **Start to brake, aiming at a smooth reduction in speed**
  - **Be predictable**
- **If you have a manual gearbox, change down**
  - **Prepare for future action**
- **Look around, right to left, ending looking towards corner**
  - **Be aware of who is around you before any action**

# Action

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- Turn steering wheel to right by threading through hands
  - Always maintain control
- Cover brake with right foot
  - Prepare for possible problem
- Continue to look at, and around, corner
  - Focus attention where unexpected hazard may appear
- Center steering wheel by threading through hands
  - Always maintain control
- Accelerate deliberately when wheels are straight
  - Always maintain control



# Questions

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- How many of you have ever analyzed a turn in this detail?
- Is it overkill?
- Is it logical?
- Will you think about it while driving home tonight?
- Will you try and graduate to left turns?

**Bottom line - Apply similar thinking to evaluating job safety**

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# DIRECTOR SEARCH

# Director Search

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- **An offer had been made to Richard Milner**
  - **He considered the offer carefully**
  - **He has informed JSA that he is refusing the offer**
- **JSA currently has no ready back-up plan**
  - **The Search Committee will meet again in January to discuss the next steps**
- **In the meantime, Christoph has agreed to continue as Director**

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# BUDGET NEWS

# Office of Sciences Budget

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- The Science budget was expected to increase by ~ 8%
  - **Instead kept at roughly constant spending power**
- DOE, Office of Sciences received an increase of 2.6% compared to FY07 (this is after earmarks, a recission, and the other Washington shenanigans)
  - FY07    \$3,797.0M
  - FY08    \$3,894.2M
  - Increase    \$97.2M    (2.6%)
- “Within Nuclear Physics, construction is funded at \$17,700M, the same as the request”
  - This means that the 12 GeV Upgrade will receive full funding (\$14M) in FY08

# DOE Office of Science Budget Allocation

- There was also a funding distribution
  - No-one knows if it came from the Office of Science, the DOE, or a congressional staffer

|  | FY07  | FY08   | after recession | \$ Change | Percent Change |
|--|-------|--------|-----------------|-----------|----------------|
| DOE Office of Science                  | 3,797 | 4055   | 4018.1          | 221.1     | 5.8%           |
| DOE SC minus earmarks                  | 3,797 | 3930   | 3894.2          | 97.2      | 2.6%           |
| Advanced Scientific Computing Research | 283.4 | 354.4  | 351.2           | 67.8      | 23.9%          |
| Basic Energy Sciences                  | 1,250 | 1281.6 | 1269.9          | 19.9      | 1.6%           |
| Biological and Environmental Research  | 483.5 | 549.4  | 544.4           | 60.9      | 12.6%          |
| Fusion Energy Sciences                 | 319   | 289.2  | 286.6           | -32.4     | -10.2%         |
| High Energy Physics                    | 751.8 | 694.6  | 688.3           | -63.5     | -8.4%          |
| Nuclear Physics                        | 422.8 | 436.7  | 432.7           | 9.9       | 2.3%           |
| SC Program Direction                   | 166.5 | 179.4  | 177.8           | 11.3      | 6.8%           |
| Scientific Infrastructure              | 42    | 65.5   | 64.9            | 22.9      | 54.5%          |
| Workforce Development                  | 7.95  | 8.12   | 8.0             | 0.1       | 1.2%           |
| earmarks                               |       | 125.6  | 123.6           | 123.6     |                |

# Big Losers

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- **Fusion – 10.2%**
  - **ITER zeroed out**
    - **May not stick (requires breaking an international agreement)**
- **HEP – 8.4%**
  - **ILC reduced from \$60M to \$15M**
    - **SRF from \$25M to \$6M**
  - **Reduction will halt Fermilab infrastructure build-up**
  - **Short term, severely reduces ILC funding for JLab**
    - **Long term impact is unclear, could even be good**
    - **It makes our role in Project X even more pivotal**

(More on Project X later)

# Winners

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- **BES + 1.6%**
- **NP + 2.3%**
  - **Unusual for NP to have a bigger increase than BES**
  - **Significance?**
- **Scientific Infrastructure Initiative + 54.5%**
  - **This is the funding source for our new building, the Technical & Engineering Development Facility**
    - **Argonne National Laboratory: Building Electrical Services Upgrade project to be cancelled**
    - **Brookhaven National Laboratory: Renovation Science Laboratory, Phase I, delayed one year**
- **Overall JLab has done better than most other Labs**

**Still not great!**



# Impact at DOE Laboratories

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- **Fermilab**
  - 200 people will be laid off
  - All staff will take 2 days unpaid leave per month
- **SLAC**
  - 125 people will be laid off, in addition to the existing voluntary/involuntary layoff program for 100 people
  - PEP-II will terminate (for ever) in March, 6 months earlier than foreseen
- **BNL**
  - RHIC operation reduced from 30 cryo-weeks to 19 cryo-weeks

# Impact at other DOE Laboratories (cont)

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- **LLNL**

- **Will reduce its supplemental and flexible term workforce by as many as 500 people**

**“If we cannot reduce our costs and we have less than normal attrition for the year, we will have to re-examine the impact on our career workforce”**

# Impact at JLab

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**A decision has been by top management that the lab's top priority will be maintaining staff**

# Next Steps - US Science

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- Ray Orbach (Director of the Office of Science) has asked HEPAP, BESAC and NSAC to re-convene and provide an updated list of scientific priorities to him by March 31
  - This may result in a proposal to close a facility
- From the rumors I hear, SLAC is particularly vulnerable, with the (already) planned closure of PEP-II this year
  - DOE may decide to reduce or delete non-BES activity
    - i.e. maintain the LCLS and cancel all of the ILC related work
- Fermilab will be aggressively pursuing “Project X”
  - JLab will be a full partner in this project

# Project X

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- Project X is a concept for an intense 8 GeV proton source that provides beam for the Fermilab Main Injector and an 8 GeV physics program
- The source consists of an 8 GeV superconducting linac that injects into the Fermilab Recycler where multiple linac beam pulses are stripped and accumulated
- The 8 GeV linac consists of a low energy front end possibly based on superconducting technology and a high energy end composed of ILC-like cryomodules
- The use of the Recycler reduces the required charge in the superconducting 8 GeV linac to match the charge per pulse of the ILC design; aligning Project X and ILC technologies

# Next Steps - JLab

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- **JLab is extremely well positioned for the future**
  - **New project (12 GeV) is top-ranked by NSAC**
  - **6 GeV experimental results are world-class**
- **Nothing will be left to chance to ensure that the scientific case for our Physics experiments is made strongly and effectively**
- **The Test Lab is a unique facility and SRF technology is in demand by many other labs**
  - **This is an asset that we must “sell”**
- **We have other areas of expertise (Injectors, ERLs, FELs)**
  - **We seek partnership opportunities wherever possible**

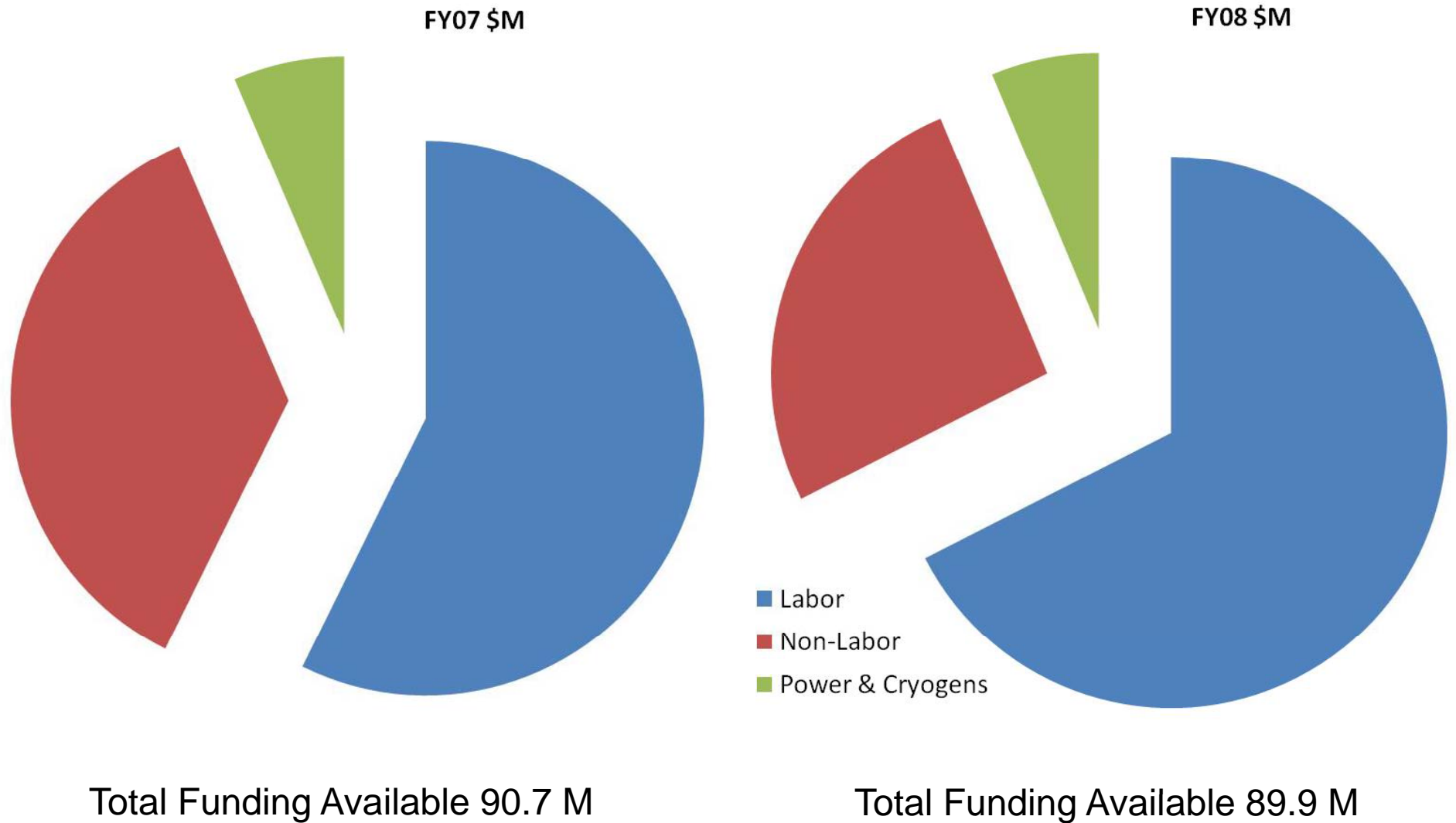
# JLab Budget

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- **Jehanne Simon-Gillo (Head of DOE-NP Division) has developed a budget (she had virtually no wiggle room)**
  - **FY08  $\approx$  FY07**
    - **Equivalent to a year-long continuing resolution**
    - **Means a reduction in spending power of  $\sim 3\%$**
  - **But - there is an additional \$14.3 M for 12 GeV**
- **Implication**
  - **Same total number of dollars**
    - **With raises and new staff, salary costs increased**
  - **Salaries are  $\sim 60\%$  of JLab budget,  $\sim 68\%$  of Accelerator**

**Big reduction in procurements**

# JLab NP Budget Breakdown





# Overview of Budget Impact

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- **Sum of Accelerator Division AWP's is reduced by \$2.9M**
  - **Most of the Engineering Division budget is contained in the Accelerator Division AWP's**
- **We will maintain full staffing**
  - **We will have very little procurements**
  - **We have fewer/easier deliverables**
- **No whining – others are much worse off**
- **Don't polish your resume – good people from other labs are desperately seeking employment!**

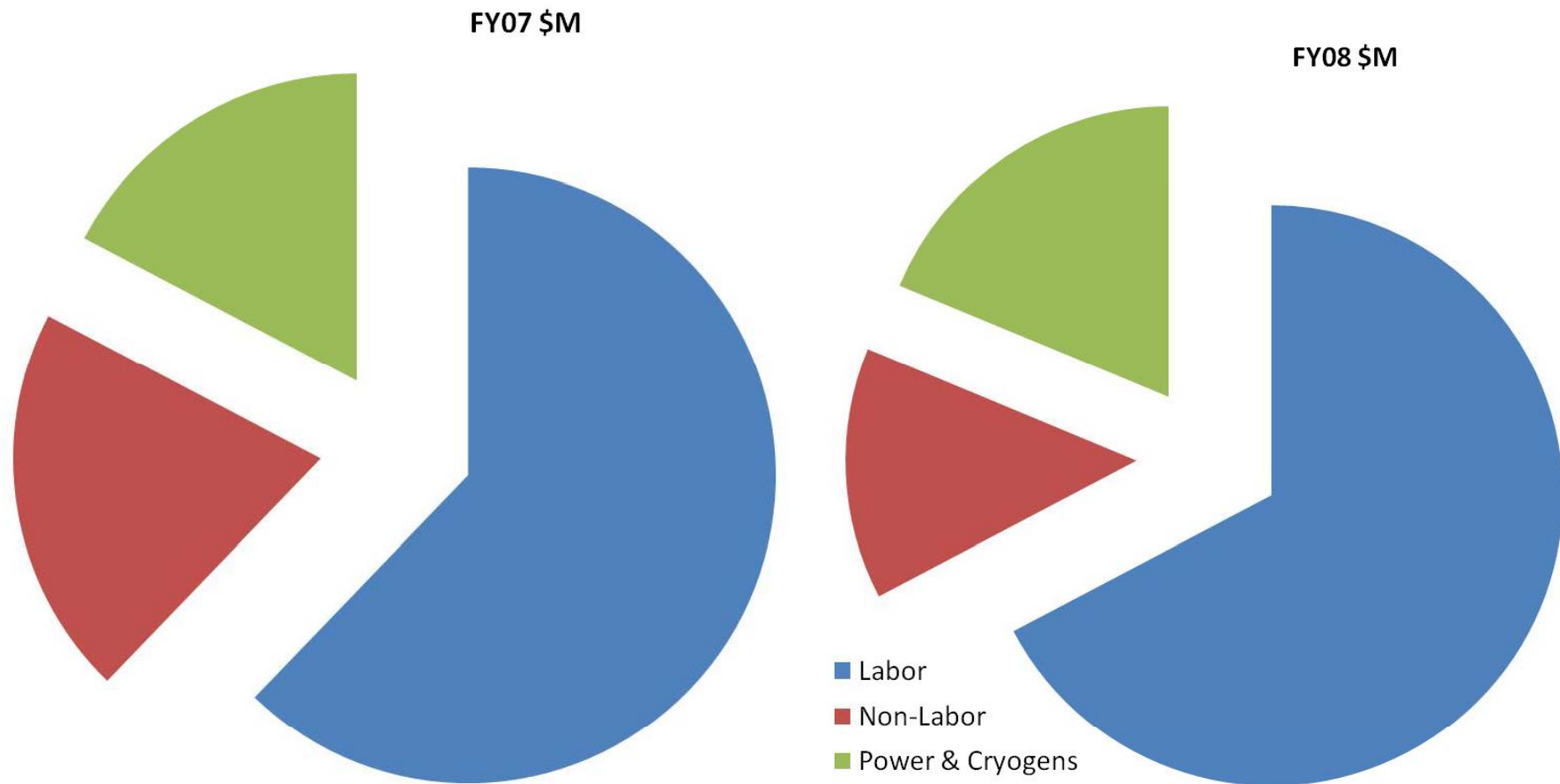
**Treat this as an OPPORTUNITY!**

# Impact on Accelerator Division

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- The Accelerator Division has been hit really hard by the budget
- In addition to reduction in NP funding
  - ILC funding (\$1M) has been pulled back
    - We actually had the check in hand!
    - May still receive
  - BES funding (\$1M) is now doubtful
  - Other WFO seems unlikely in FY08
    - Other labs have even less money than we do

# Total Accelerator AWP Budget



Total Funding Spent 28.4M

Total Funding Available 26.7M

# Major Impacts Details Later

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- **Full speed ahead on 12 GeV**
  - **Seeking opportunities to transfer staff to 12 GeV work**
- **Accelerator operations for Nuclear Physics end June 11**
  - **Operation may not restart for Nuclear Physics before January 2009**
  - **Max energy demonstrated in FY08 = 5.7 GeV**
    - **We will continue C50 production at 3 modules/year**
  - **Warm up accelerator to room temperature**
- **No AIP**
- **Reduce infrastructure projects in Test Lab**
- **Reduce Injector R&D**

# My Challenge to Everyone

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**Develop ideas to prepare us for the future using strengths of our staff, but little cash**

- 6 GeV hardening
- Process improvements
- Procedure development
- Documentation
- ISMS preparation
- Etc.
- Etc.

# 12 GeV Manpower

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- **12 GeV Project is fully funded this year**
  - **Intention had been to roll over funds to FY09**
- **We are actively seeking to use more of this money to allay staff costs in NP program**
- **Main impact – engineers will not be available to support 6 GeV operations**
  - **Your supervisor will tell you if you are affected**
  - **Engineers will not attend 8 am meetings**
  - **Engineers will not attend weekly scheduling meeting**
  - **Engineers will be available for “crisis support”**
- **I believe our technicians are so good that we will not have crises!**

# Accelerator Operations

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- **Proposals still being finalized**
- **Ingredients involve:**
  - **Saving electricity and cryogens by:**
    - **Reduced operation for NP experiments**
    - **Charging FEL for solo operations**
    - **Warming cryomodules to 300K during the down**
      - Carry out repairs on warm cryomodules
      - Perform maintenance on cryo-plant
    - **Commissioning several C50 modules in parallel**
  - **Saving spares and repair costs by reduced operation**
    - **Re-invest some fraction in preventive maintenance**

# SRF Institute Budget

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- Funding for ILC work has been pulled back
  - Still trying to recover some of it
- AES will be affected by ILC funding
  - We are unlikely to get more work from them
- Expected \$1M BES funding may not appear
  - Haven't given up hope
    - Gwyn Williams/George Neil very active
- FEL has reasonable funding, may have some work
  - It takes time for funds to trickle down
    - Tend to get “taxed” at each bureaucratic level!



# SRF Institute Impact

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- Most facility upgrades must be postponed
- We will continue to push forward on C-50 refurbishment
  - Manpower for 3 per year is available
  - Is budget sufficient for needed procurements?
- Focus on manpower-intensive activities
- Unable to fund consultant to help ISO-9001
  - Will try and improve processes on our own
- Continue to actively seek outside funding

# Summary

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- **Budgets for US science are extremely bad**
  - **May have significant impact on long term future of DOE Office of Science Laboratories**
- **Budget for Nuclear Physics is better than most, not great**
- **JLab looks to be positioned well for the long term**
- **In FY08**
  - **Focus on high labor, high impact, low procurement activities**
  - **Maintain safe workplace**
  - **Take the opportunity to prepare for future activities**

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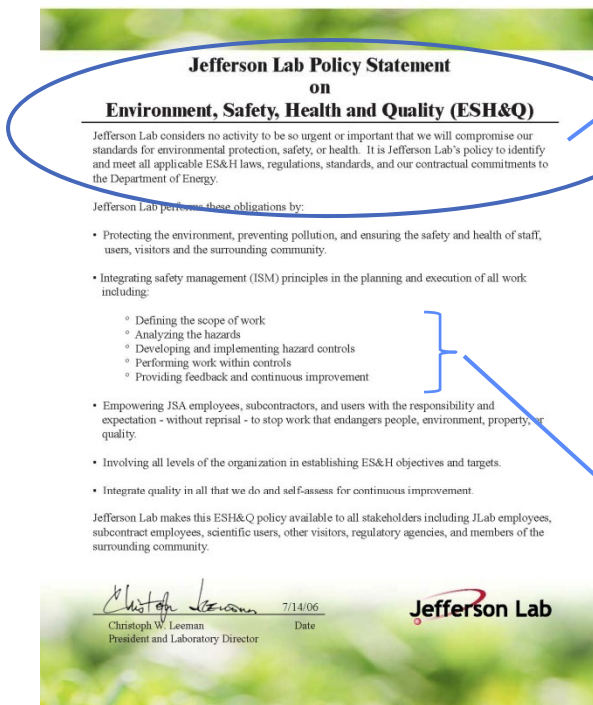
# Integrated Safety Management

More than just a buzz-word

Phil Mutton

January 22<sup>nd</sup> 2008

# I.S.M. It's a Matter of Principle



***"Jefferson Lab considers no activity to be so urgent or important that we will compromise our standards for environmental protection, safety or health."***

***Christoph W. Leemann***

**DOE Policy + JLab Policy**

**Integrated Safety Management**



**SEVEN GUIDING PRINCIPLES**



**FIVE CORE FUNCTIONS**

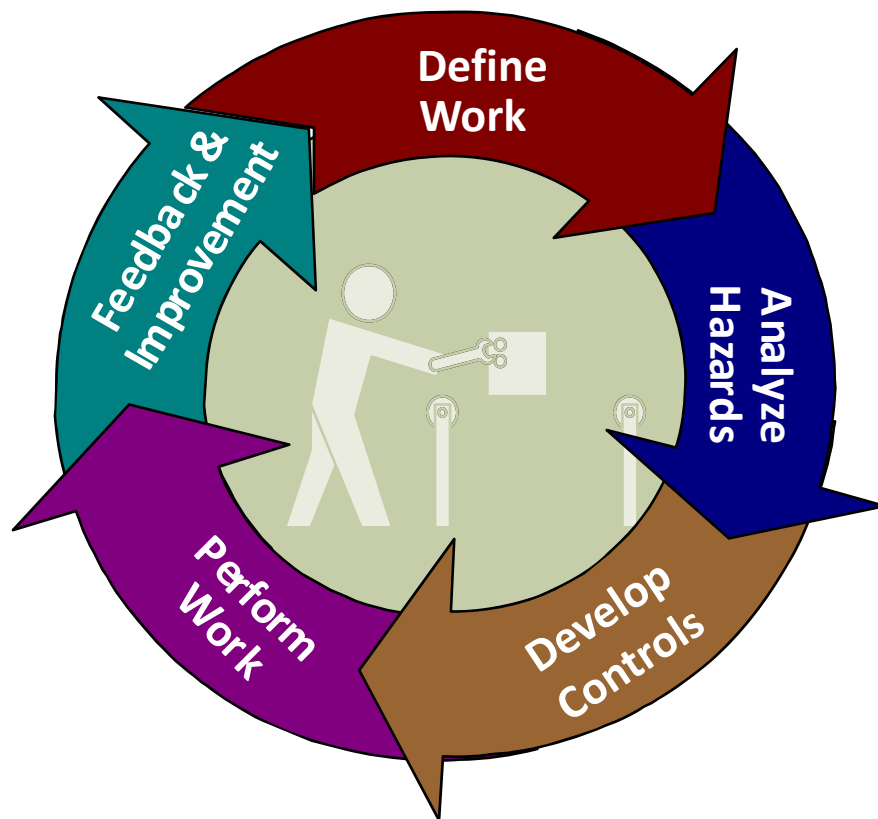
# SEVEN GUIDING PRINCIPLES

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- (1) Line Management Responsibility for Safety*
- (2) Clear Roles and Responsibilities*
- (3) Competence Commensurate with Responsibilities*
- (4) Balanced Priorities*
- (5) Identification of Safety Standards and Requirements*
- (6) Hazard **Controls** Tailored to Work Being Performed*
- (7) Operations Authorization*

Implemented through  
FIVE CORE FUNCTIONS in every activity

# FIVE CORE FUNCTIONS



1. Define the Scope of Work
2. Analyze the Hazards
3. Develop and Implement Hazard Controls
4. Perform Work Within Controls
5. Provide Feedback and Continuous Improvement

# DOE ISM Assessments

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- **SLAC and BNL in 2007**
  - **Extensive Review of all Aspects of Work**
- **JLab Assessment by DOE - HSS/OIO**
  - **May/June 2008**
- **Preparation:**
  1. **Internal Assessment**
  2. **Make Improvements**
  3. **Training - terminology, etc.**



# Internal Assessment

## ISMS CORE FUNCTION TEAMs



**TEAM #1** – will assess how missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.

**Co-chairs:** Kelly Trembley    **Members:** Byron Golden  
John Riesbeck                      Debra Brand  
Howard Fenker



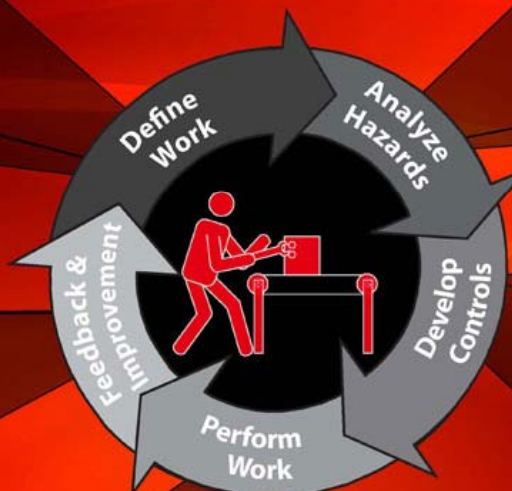
**TEAM #2** – will assess how hazards associated with the work are identified, analyzed and categorized.

**Co-chairs:** Bill Vulcan    **Members:** Harry Fanning  
Joe Beaufait                      Manny Nevarez  
Dave Hamlette



**TEAM #5** – will assess how feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory enforcement actions occur.

**Co-chairs:** Neil Wilson    **Members:** Tina Menefee  
Brian Bevins                      Richard Williams  
Cindy Saban  
Brian Kross



**TEAM #3** – will assess how applicable standards and requirements are identified and agreed-upon, controls to prevent/mitigate hazards are identified, the safety envelope is established, and controls are implemented.

**Co-chairs:** Phil Mutton    **Members:** Brad Cumbia  
William Berkley                      Kevin Jordon  
John Kelly



**TEAM #4** – will assess how readiness is confirmed and work is performed safely

**Co-chairs:** Tom Briggs    **Members:** Tom Hassler  
Derrick Dail                      John LeRose  
James Coleman  
Ned Walker



**Jefferson Lab**

Thomas Jefferson National Accelerator Facility (Jefferson Lab) is managed by Jefferson Science Associates, LLC for the United States Department of Energy Office of Science.  
www.jlab.org • 707 269 7100 • Jefferson Lab, 12000 Jefferson Avenue, Newport News, VA 23606 •



# ISM Core Function Teams

|             | <b>Co-Chair/<br/>Mgr Sup/<br/>Team Lead</b> | <b>Co-Chair/<br/>WSC</b> | <b>Team<br/>Member</b> | <b>Team<br/>Member</b> | <b>Team<br/>Member</b> | <b>Team<br/>Member</b> |
|-------------|---|--------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>CF#1</b> | Kelly Trembley                              | John Riesbeck            | Byron Golden           | Debra Brand            | Howard Fenker          | NA                     |
| <b>CF#2</b> | Bill Vulcan                                 | Joe Beaufait             | Harry Fanning          | Manny Nevarez          | Dave Hamlette          | NA                     |
| <b>CF#3</b> | Phil Mutton                                 | William Berkley          | Brad Cumbia            | Kevin Jordon           | John Kelly             | NA                     |
| <b>CF#4</b> | Tom Briggs                                  | Derrick Dail             | Tom Hassler            | John LeRose            | James Coleman          | Ned Walker             |
| <b>CF#5</b> | Neil Wilson                                 | Brian Bevins             | Tina Menefee           | Richard Williams       | Cindy Saban            | Brian Kross            |

# ISM Core Function Teams

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- Each team will collect information from each JLab organization (similar to DOE assessment process)
- Major activities will include:
  - Attending pre-job briefings
  - Attending daily, weekly meetings
  - Observing work planning and execution activities
  - Interviews of supervisors, safety wardens, floor workers, members of the user community, subcontractors
  - Reviewing work control documents, etc.

# CF #1 Define Scope

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## Documents/Processes include:

- FEList Task Description
- ATList Task Description
- TATL Task Description
- Independent Investigator Proposal
- Program Advisory Committee / Experimental Schedule
- Work Order or Subcontractor Specifications
- Worker Health and Safety Protection Program
- Radiation Protection Program
- Contractual Compliance Documents

## CF #2 Analyze Hazards

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### Documents/Processes include:

- ES&H Manual Chapter 3210, Hazard Identification and Characterization
- ES&H Manual Chapter 3410, EH&S Aspects of Material Acquisitions
- ES&H Manual Chapter 3420, Procured Services and Construction
- Laser Operations Directives
- Experiment Safety Approval Form
- Accelerator Operations Directives (AOD)
- ATLis, FELis, TATL Hazard ID Checklist, Task Hazard Analysis
- Conduct of Operations (COO)
- Experiment Safety Assessment Document
- Radiation Safety Assessment Document

### 12 GeV Project

- ES&H Manual Chapter 3110, Assessments of New Facility Plans

# CF #3 Implement Controls

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## Documents/Processes include:

- ES&H Manual Chapter 3210, Hazard Identification and Characterization
- Standard Operating Procedures
- Operational Safety Procedures
- Temporary Operational Safety Procedures
- Training
- Laser Operations Directives
- Experiment Safety Approval Form
- Accelerator Operations Directives (AOD)
- Conduct of Operations
- Experiment Safety Assessment Document
- Radiation Safety Assessment Document
- Subcontractor Safety Plan

# CF #4 Work Within Controls

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## Documents/Processes include:

- FEList File Approval and Implementation
- FEL Operation Plan Approval and Implementation
- Shift Plan Approval and SOP Implementation
- ATLis File Approval and Implementation
- TATLs File Approval and Implementation
- Experiment Readiness Clearance and SOP Implementation
- Task Hazard Analysis and Implementation
- Subcontractor Safety Plan Approval and Implementation
- Daily Work Plan Approval

# CF #5 Feedback and Continuous Improvement

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## Documents/Processes include:

- Daily Planning Meetings
- ATLis, FELis, TATL Comments
- FLOG
- Pre-Job Meetings
- Post Job Closeout
- STOP
- Work Observations
- CATS
- Concern Reports
- INSIGHT Webpage
- On-Line Forum
- Weekly Meetings
- Various E-Logs
- Safety Warden Area Inspections
- ESH&Q Self Assessments
- Peer Reviews
- Worker Safety Committee
- Director's Safety Council
- ORPS
- DOE Corporate Lessons Learned

# The Budget

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**FY 2008 - with fewer dollars this year we must:**

- **Focus on activities requiring modest procurement outlays**
- **Use our labor resources to make improvements for the future.**

The Opportunity



# The Opportunity

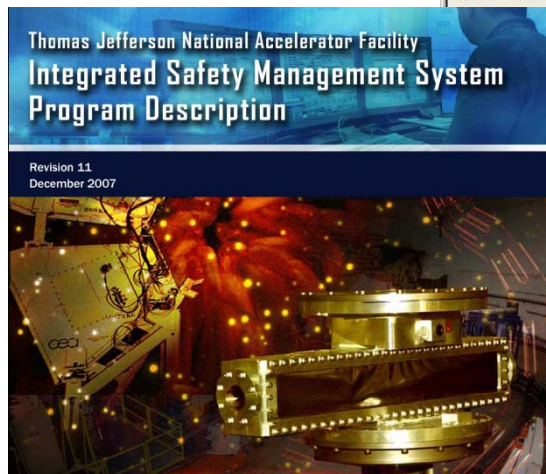
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- Improving Work Planning Processes (CF#1)
- Improving Analysis of Hazards (CF #2)
- Improving Procedures and Other Controls (CF #3)
- Working Within Controls [\$\$ project dependent] (CF #4)
- Applying Lessons Learn to All the Above (CF #5)

Will prepare us to work more efficiently and safely in the future

# The New ISM Web Site

The image shows two overlapping web browser windows. The top window is the 'INSIGHT' website, which has a blue header with the word 'INSIGHT' in large white letters. Below the header is a navigation bar with links: Front Page, Science, Performance, ESH&Q, News, Business Intelligence, and Apps/Forms. The main content area is divided into sections: 'My Bookmarks' (listing ESH&Q, AWP Main Page, and Staff Search), 'Personal Information' (listing AWP Status: 2 SUBMITTED, No REQs Outstanding, No REQs Awaiting Signature, Credit Waiting for Costpoint, You have 2 open EH&S tracking items, MyQueue, Staff List, Property validation: 0 items, Training-related Skills are Current, Building Access, and Personal Data), 'Spotlight News' (listing Pressure Systems classes available, MSOffice 2007 introductory training in MSWord, Excel, and PowerPoint, and TIAA-CREF - Retirement Counseling Session), and 'JLab Safety Snapshot' (listing TDC Level: 0.00). The bottom window is the 'Integrated Safety Management' website, which has a blue header with the title 'Integrated Safety Management'. Below the header is a search bar and a 'print version' link. The main content area is divided into sections: 'ISM Information' (listing Home, ISM Presentations, Important ISM Links, JLab ISM Best Practices, INTEGRATED SAFETY MANAGEMENT JARCON, ISM TERMS, GUIDING PRINCIPLES, CORE FUNCTIONS, and FREQUENTLY ASKED QUESTIONS), 'INTEGRATED SAFETY MANAGEMENT SYSTEM' (welcoming users to the website and providing a brief overview of its purpose), and 'Jefferson Lab Policy Statement' (quoting Christoph W. Leemann: 'Jefferson Lab considers no activity to be so urgent or important that we will compromise our standards for environmental protection, safety or health.').



Plus links to much more Jlab and DOE Information.

# The Goal

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- Safe Today
  - Best Practices
- Safe Tomorrow
  - Thorough planning
  - Good documentation
  - Full Use of Lessons Learned