

# Safety Assurance Thomas Jefferson National Accelerator (JLab) Perspective

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- JLab Overview
- Safety Assurance Objectives
- Assurance Program Elements
- Implementation Challenges and Approach

# JLab Overview

## Scientific purpose:

- Jefferson Lab acts as a microscope to allow us to look into the inner structure of the nucleus. The purpose of the research done at Jefferson Lab is to help us understand how quarks and gluons make up the nucleus and the forces that hold matter together.

# JLab Overview (cont)

- The heart of Jefferson Lab is its ~6 GeV (billion electron volt) electron accelerator delivering beams of unprecedented quality to 3 halls simultaneously.

# JLab Overview (cont)

- \$80M operating budget
- 650 Staff
- 1150 users
- 200 subcontractors
- ~25% of US PhDs in nuclear science over last decade

# Jefferson Science Associates (JSA), LLC

- JSA - Joint venture of Southeast Universities Research Associates (SURA) and Computer Science Corporation (CSC)
- Contract began June 1, 2006
- SURA designed, built and operated JLab
- Facility designation:
  - Low hazard, non-nuclear facility

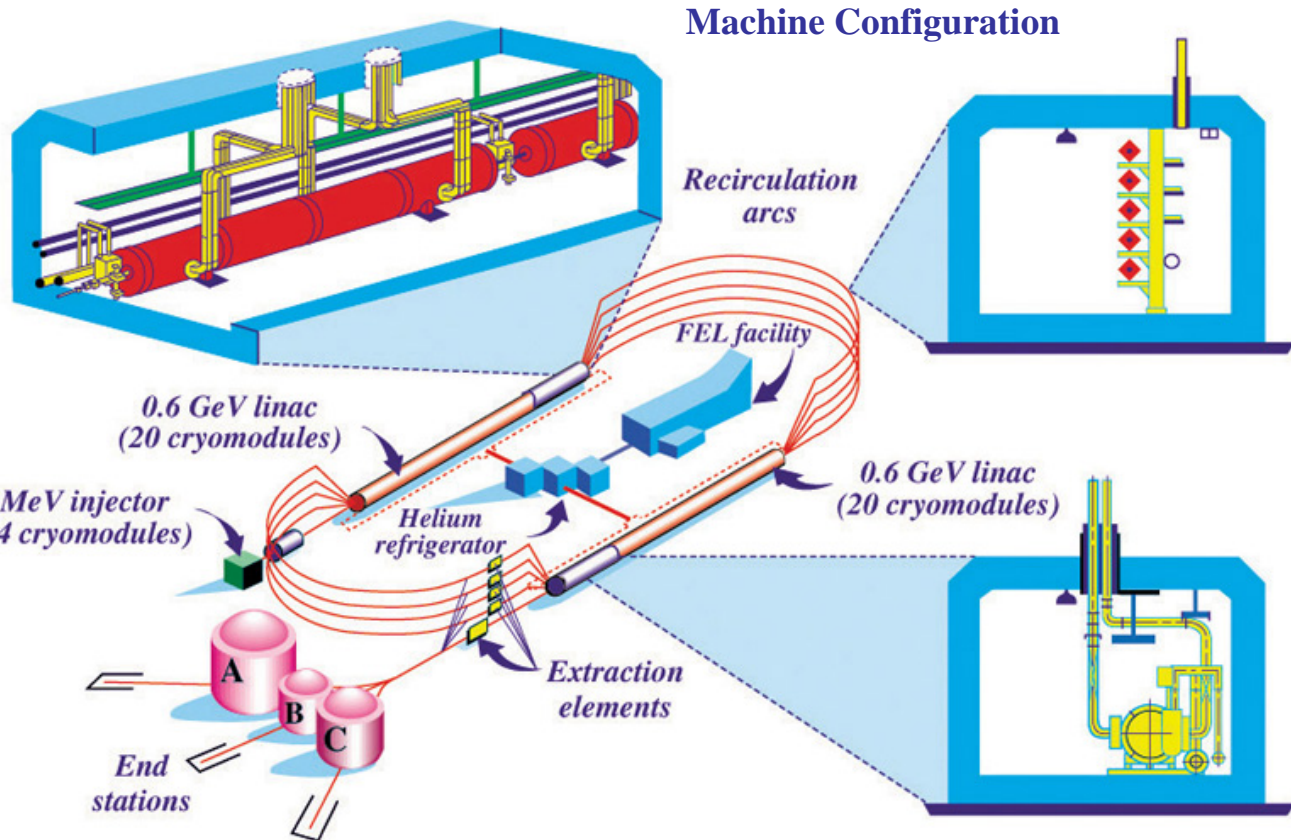
# JLab



# How We Work

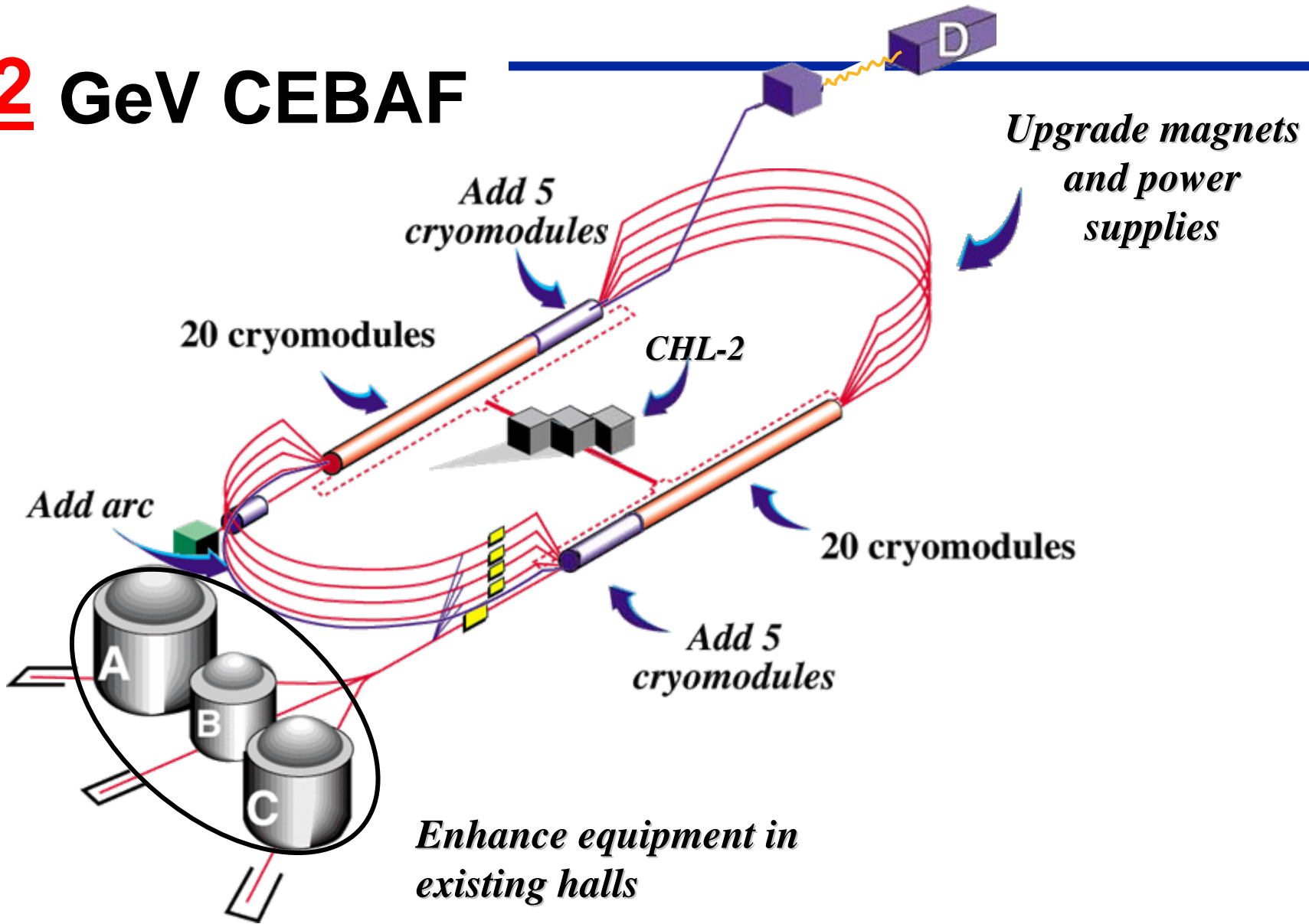


Superconducting Cavities

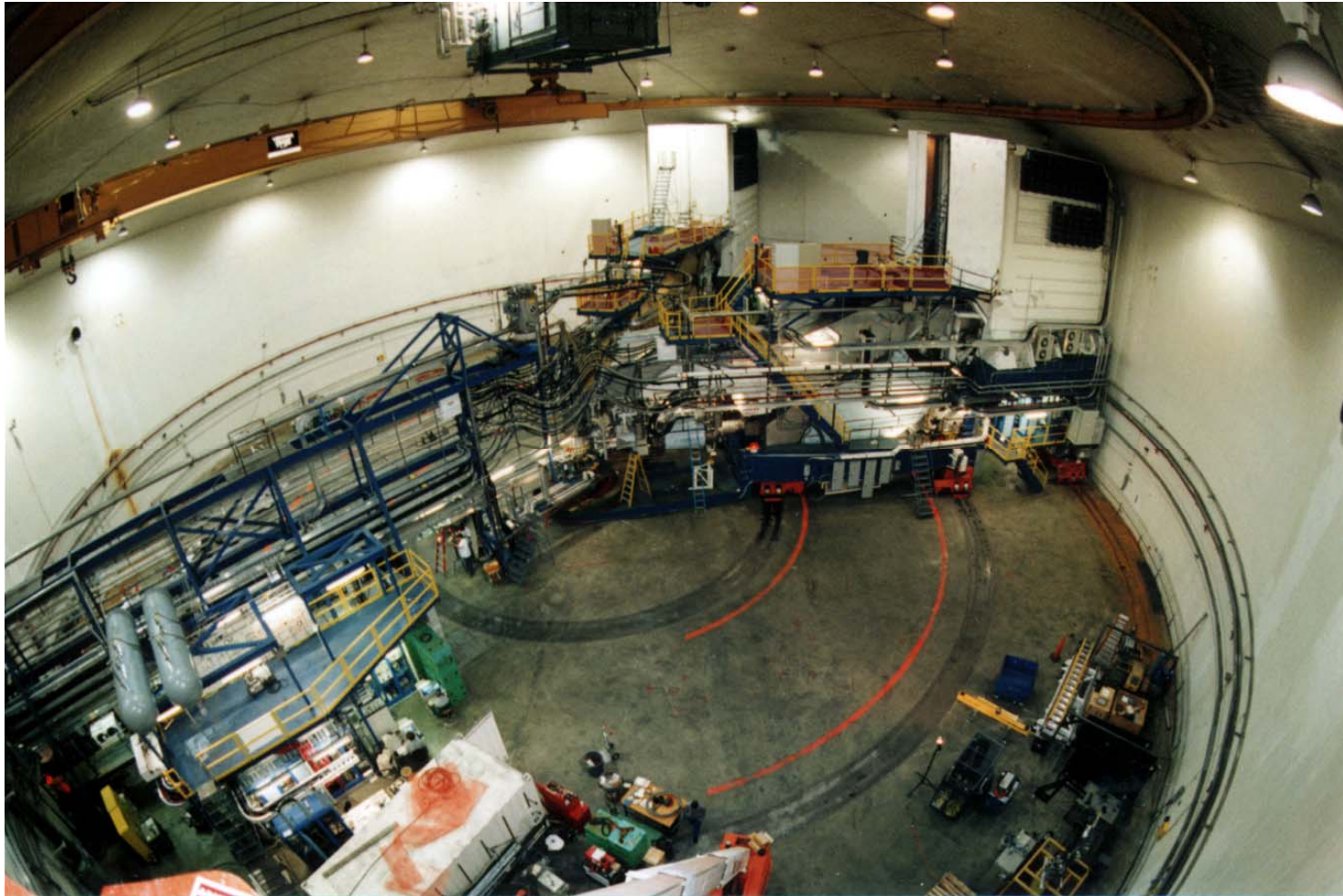




# 12 GeV CEBAF



# Experimental Hall A



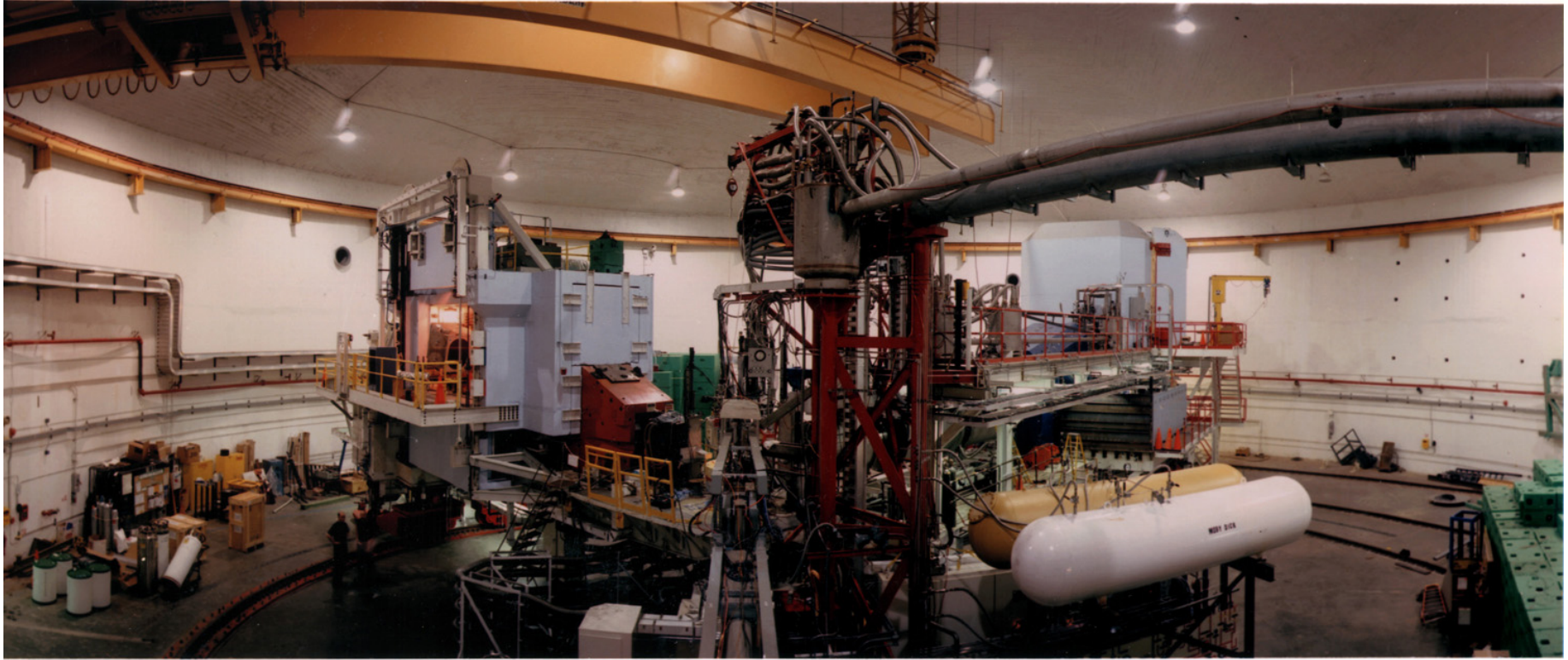
Hall A is equipped with a pair of High Resolution Spectrometers for high precision studies. Hall A just completed the HAPPEX experiment concluding that strange quarks are surprisingly scarce in ordinary nuclear matter.

# Experimental Hall B



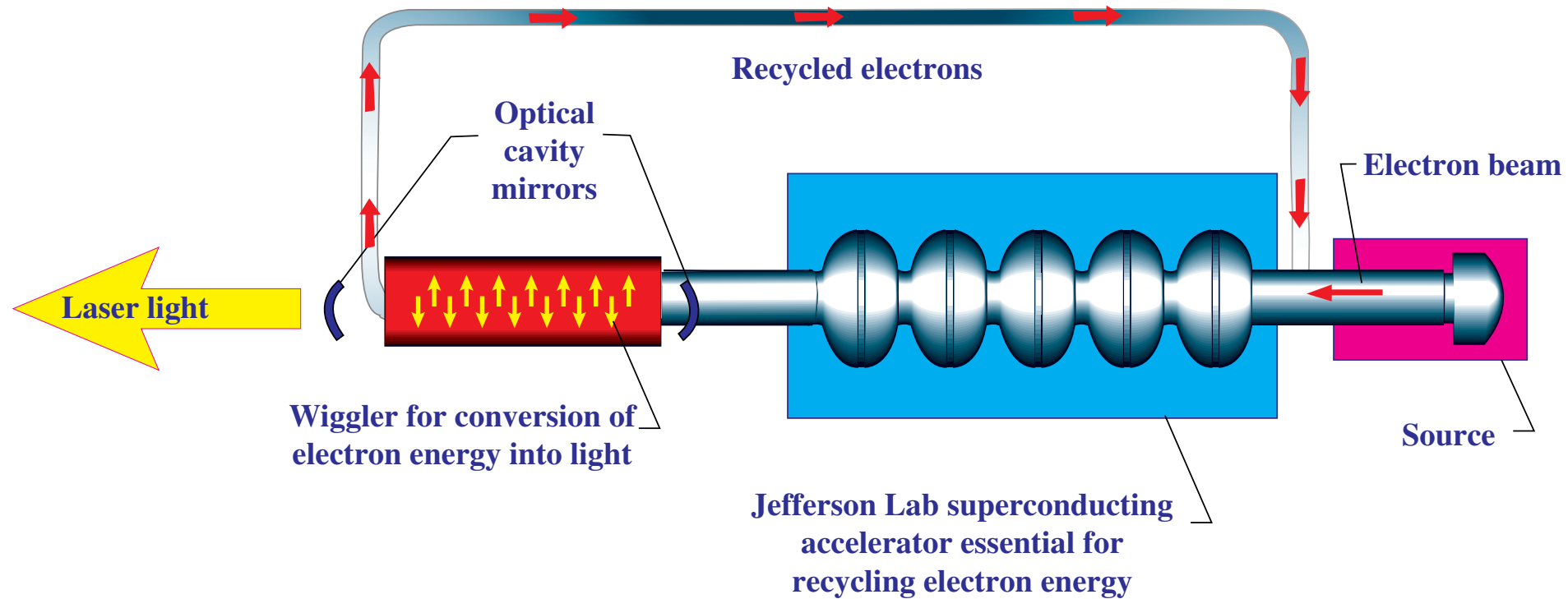
Hall B is equipped with a unique large-acceptance detector that records the products of the electron beam-target collision in all directions. Hall B records .5 terabytes of data per day (equivalent to a one-page biography each of half of the world's population).

# Experimental Hall C



Hall C was the first experimental hall to come online and is equipped with two general purpose spectrometers and is designed to accommodate specialized detectors to answer unique questions.

# Free Electron Laser Schematic



# Test Lab



# Hazards



# Hazards

- Oxygen deficiency hazards
- Electrical hazards
- Radiation (ionizing and non-ionizing)
- Elevated work
- Acids (including Hydrofluoric Acid)
- Standard Industrial Hazards



# Assurance Program Objective

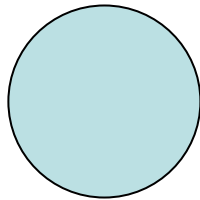
- Validate programs and processes ensure safety of staff, users, subcontractors, public, environment, facilities
- Demonstrate compliance with our contract and regulations
  - DOE 226.1
  - 10CFR835
  - 10CFR851
  - Etc.

# Assurance Program Elements

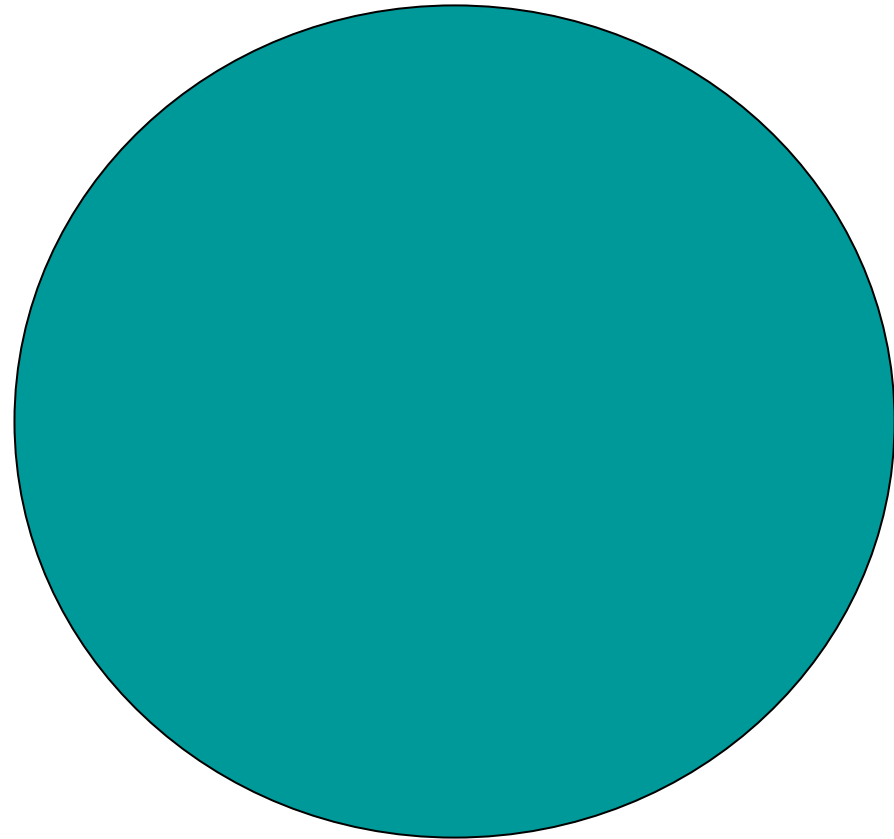
- Contract Specifications
- Regulation (10CFR835, 10CFR851)
- Policy
- Implementing documents
  - EHS Manual
  - QA Manual
  - Procedures
- People
- Training
- Lessons Learned
- Work Observation
- Program Execution

# Area of Interest

## Enforcement Umbrellas



Nuclear Safety



Non-Nuclear Safety (10CFR851)

# Implementation Challenges

- Perception of “Adds paper, not safety”
- What was good enough 5-10 years ago is not good enough now
  - Expert based “safety assurance” inertia exists
- “We do this to satisfy Safety staff and auditors”
- Vertical and Horizontal Alignment of implementation – Senior Management, middle management, first line supervisor, staff

# Real field 10CFR851 challenges

- Important issues still being resolved (e.g. Is \$5000 paint contract subject to a \$70,000 fine?)
- Competing directives (e.g. small business goals vs. pristine subcontractor safety program/compliance)
- More safety assurance = more \$
  - It must have obvious benefit to line management

# JLab Approach to Challenges

- Focusing on “felt leadership” aspect of safety
  - Implementing DuPont/Battelle developed safety leadership skills
- Continuous Awareness efforts
- Independent validation of ISM Implementation
- Working closely with TJSO on all issues
  - Events, near misses
  - 10CFR851 implementation issues
- Training “Enforcement Officer”
- Using worker safety committees to help solve problems

# The Perfect Balance

- People
  - Training and Qualification
  - Awareness, Observations, Feedback
  - Leadership
- Paper
  - Policy and procedures, work processes
  - Risk-based rigor – find the right threshold
- Plant (Facility)
  - Risk based “Find and Fix”
  - Maintain safe facilities

# Summary

- JLab is a critical SC lab with leading edge scientific mission
- JLab Safety Assurance Elements are in place and implementation is improving
- Challenges exist, and are not unique to JLab
- Our emphasis is turning to the “people” aspect to increase safety assurance



# Lawyer Joke Slide



Thomas Jefferson National Accelerator Facility

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Questions?