Office of Science

Operations Reviews of the Continuous Electron Beam Accelerator Facility and the Relativistic Heavy Ion Collider Facility

Presented to:
Nuclear Science Advisory Committee

March 14, 2002

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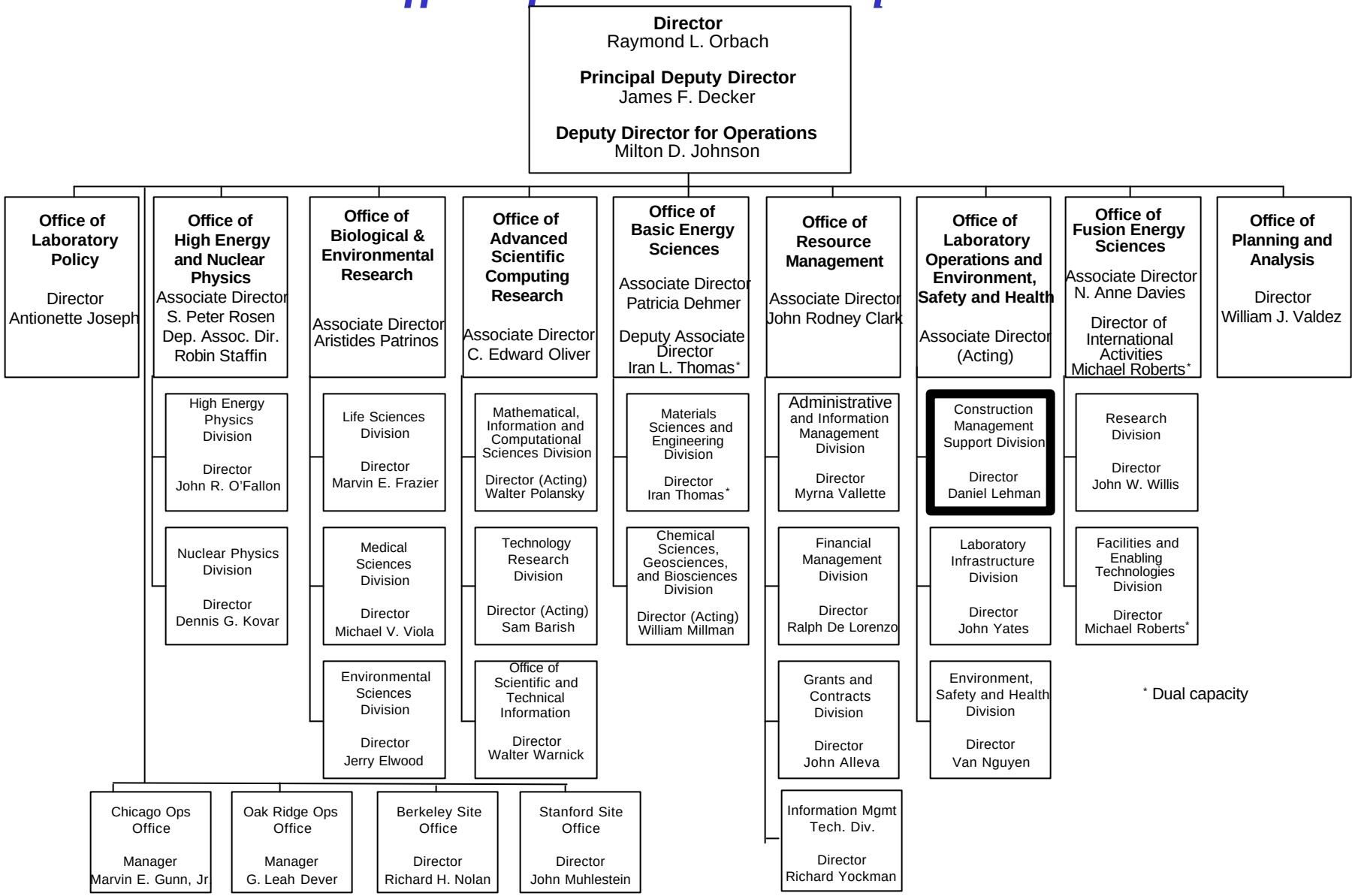
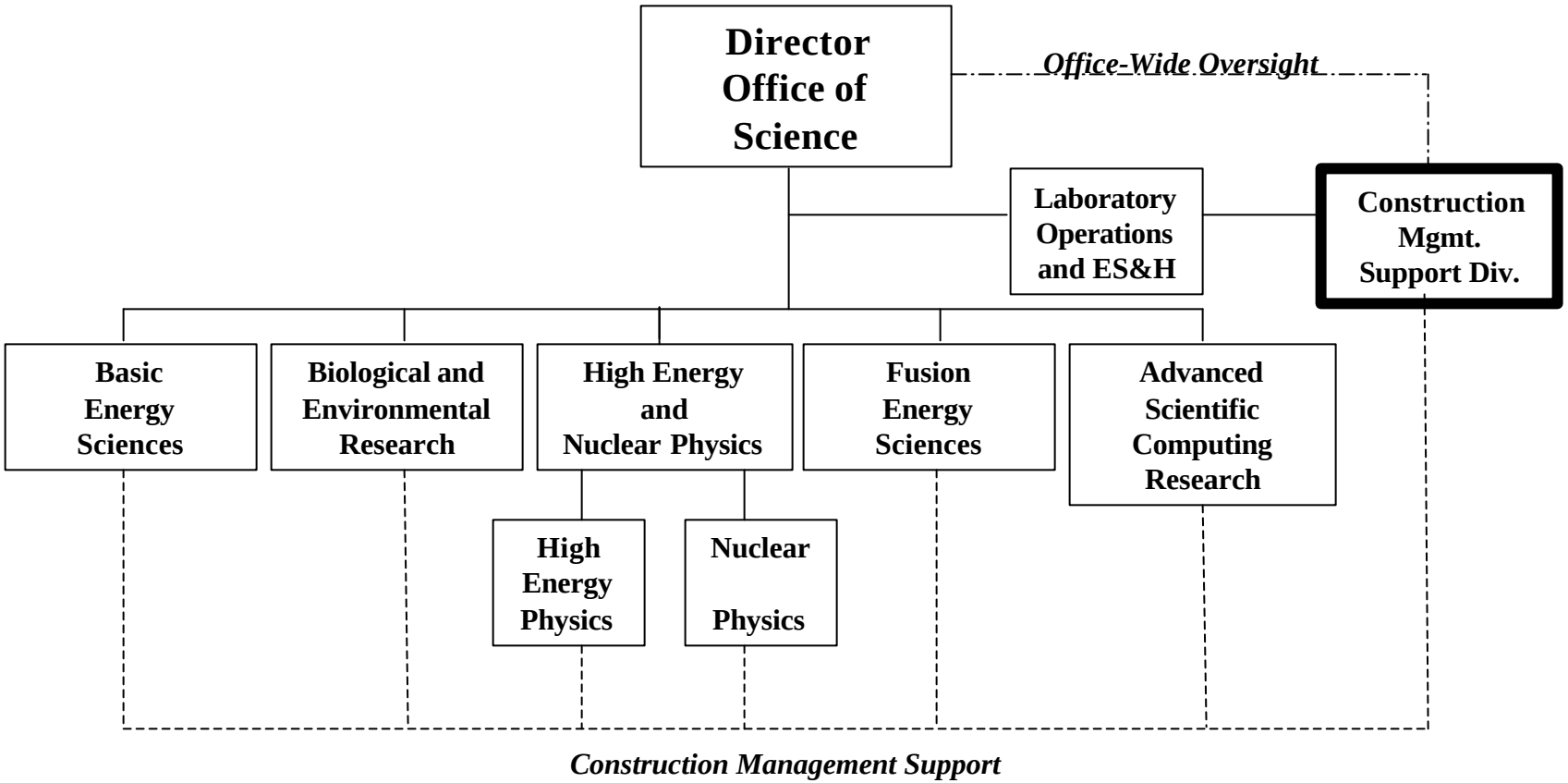
Construction Management Support Division

Office of Science—Headquarters



Role of CMSD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Operations Reviews of CEBAF and RHIC

- **CEBAF Review.** Conducted January 22-24 at Thomas Jefferson National Accelerator Laboratory.
- **RHIC Review.** Conducted February 5-7 at Brookhaven National Laboratory.
- **Review Objective.** Provide a better understanding of what it costs to productively operate each laboratory and the impacts and benefits if funding resources were to change.
- **Charge to the Committee.**
  - Perform an analysis and evaluation of the present facility operations.
    - What is the mission of the facility?
    - How are resources currently used (bottoms-up analysis) to carry out this mission?
    - Are available resources optimized for the most productive program?
  - Evaluate the impacts of different funding levels on the productivity of the facilities.
    - What level of facility operations and scientific productivity could be sustained into the out-years with constant effort funding (at the FY 2002 Appropriations level)?
    - What benefits, in order of priority, could be realized with incremental funding above this level.

Charge/Review Committee

CEBAF Facility Operations Review

- **Physics and Experimental Program**
  - Program is lean, but producing exciting physics results
- **Accelerator Operations**
  - Resources, funding, and staffing levels are reasonable
- **Environment, Safety and Health**
  - Technically sound and operationally successful
  - Line management is responsible and held accountable for safety
- **Funding**
  - Constant Effort Scenario ($73.8 million FY 2002 Nuclear Physics funding)
    - Lab could operate CEBAF for approximately 30 weeks at 5.7 GeV and 70% reliability
    - Would result in increased down time due to deferred availability, deterioration of core competencies, and significant problems with capability improvements
  - Additional funding (up to $6.5-9 million)—Recommended by the Committee
    - Would result in improved sustainable operations (up to 35 weeks) and enhanced research

CEBAF Facility Operations Review

- **Management**
  - A reorganization of the experimental engineering and technical staff into common groups should be considered
  - The Laboratory should develop a comprehensive and proactive plan for addressing long-term accelerator, experimental equipment, and conventional facilities maintenance
  - The Director should consider establishing a Scientific Policy Committee at the Lab to advise on scientific policy issues

- **Summary**
  - Jefferson Lab is well managed and producing first-rate science
  - Current funding is lean for meeting the mission of the Lab and for maintaining effective utilization of its facilities
  - Future increases in funding will be required to maintain the current contribution to the Nation's science
  - More research could be performed if relatively small increases were made in annual funding

RHIC Facility Operations Review

- **Physics and Experimental Program**
  - Present level of support is sufficient for a 30-week run
  - Computing Facility is challenging and needs increased resources immediately
- **Accelerator Operations**
  - Currently dealing with issues associated with availability, including older facilities (e.g., AGS and tandems) and other new components of RHIC
- **Environment, Safety and Health**
  - Technically sound and operationally successful ES&H program
- **Funding**
  - Reduced scenarios are not workable or sustainable long term
  - Constant level of effort ($104.5 million FY 2002 excluding Waste Management)
    - Presents a viable physics program, and based on reliability improvements could increase current 19-week run
    - Significant risk of major failures due to lower than ideal level of accelerator maintenance
  - Additional Funding (up to $16 million FY 2002)—Recommended by the Committee
    - Provides for a strong physics program, a responsible accelerator maintenance effort, and preparations for desired accelerator, detector upgrades, with operations up to 35 weeks

RHIC Facility Operations Review

- **Management**
  - Medium- and long-range plans appear to be established without external review
  - Five-year planning should be science-based and should include framework for optimizing resources in order to reach key goals
  - BNL would benefit from augmenting the intermediate and long-range resource planning for the RHIC program so that the focus of the program on the most critical scientific goals is enhanced
    - Possible solutions may include expanding scope for the existing PAC or utilizing a new advisory group to help BNL articulate it focus

- **Summary**
  - RHIC is well managed and producing first-rate science
  - Current funding is lean for meeting BNL's mission and maintaining effective utilization of its facilities
  - Increased funding will be required to maintain current science contributions
  - More research could be performed if small increases were made in RHIC annual funding