



**Mid-Year Self-Evaluation**

**Brookhaven National Laboratory**

**Fiscal Year 2002**

**12 June 2002**

BROOKHAVEN SCIENCE ASSOCIATES  
Under contract with the U.S. Department of Energy

Prime Contract Number AC02-98CH10886  
Prepared by: The Office of Management Services  
Brookhaven National Laboratory

FY 2002  
Mid-Year Self-Evaluation  
of  
Brookhaven National Laboratory

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Dr. Peter Paul, Interim Director, Brookhaven National Laboratory



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May 20, 2002

Mr. Frank Crescenzo  
Acting Area Manager  
Brookhaven Area Office  
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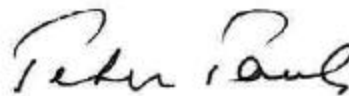
Dear Frank,

BSA has completed its Mid-Year 2002 Self Evaluation. The evaluation report is attached for your review and consideration. Based upon our self-evaluation, BSA has determined that the projected overall year-end score for the Laboratory will be "*OUTSTANDING*".

The mid-year score for Critical Outcome 2 is 3.6 while the mid-year score for Critical Outcome 3 is 3.4. No mid-year quantitative analysis is performed for Critical Outcome 1, Science and Technology.

I would like to note that corrective actions have been developed for all items that rated less than 3.0. These plans are included in this document at the appropriate locations.

Sincerely,



Peter Paul  
Interim Director  
Brookhaven National Laboratory

cc: T. Sheridan  
S. Maloney

Attachment: Fiscal Year 2002 Mid-Year Self Evaluation Report

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## **PREFACE**

This is the Mid-Year Self Evaluation Report for Fiscal Year 2002 for Brookhaven National Laboratory. It reflects Brookhaven Science Associates' (BSA) assessment of how the Laboratory performed against each of the performance measures in the Prime Contract between BSA and the DOE for operating Brookhaven National Laboratory during the first half of fiscal year 2002. The report is composed of an Introduction, Executive Summary, and discussion of the performance for each Critical Outcome Measure.

This document was prepared using Brookhaven National Laboratory's Integrated Information Management System (IIMS). The IIMS is a web-based, real-time planning and performance management tool, which was developed by the Office of Management Services (OMS) at Brookhaven National Laboratory to integrate laboratory planning and performance.

## Introduction

With the Implementation of the Performance-Based Contract between Brookhaven Science Associates (BSA) and the Department of Energy (DOE) for operating Brookhaven National Laboratory (BNL), BSA is required to execute a Performance-Based Management System (PBMS). The PBMS is designed to include clear, reasonable, and objective performance measures as standards to assess BSA's overall performance of scientific, technical, operational and managerial obligations. For FY2002, the performance measures contained in the Prime Contract have been divided into three Critical Outcomes; Excellence in Science & Technology, Operational Excellence, and Leadership & Management. The mid-year results of BSA's self-evaluation with respect to these critical outcomes are presented in this report.

This evaluation report is organized as follows:

Executive Summary Performance

Performance Review Detail including:

- Bar graph representation of performance to the Objective Level
- Critical Outcome Tree
- Detailed Performance Report

It is important to note that this mid-year assessment provides top level performance information for Critical Outcome 1 (*Science and Technology*) but does not provide quantitative assessments in this area. The analyses for Critical Outcomes 2 (*Environmental Restoration*) and 3 (*Laboratory Management and Operations*) provide more detailed assessments and numerical rankings.

This report will be updated in October 2002 to provide year end fiscal year 2002 overall data. The report will be provided to the DOE as the 2002 Annual Self-Evaluation Report.

## Executive Summary

For fiscal year 2002, in accordance with Article 6 of the Prime Contract, the Department of Energy (DOE) and Brookhaven Science Associates (BSA) have agreed to use a Performance-Based Management System (PBMS) which includes clear and reasonable objectives against which BSA's overall performance will be evaluated. For this purpose, an objective hierarchy consisting of Critical Outcomes, underlying Objectives, and associated Performance Measures with predetermined weights and metrics was developed for the assessment of BSA's performance and the resulting determination of fee.

In fiscal year 2002, the performance measures contained in the Prime Contract (detailed in Appendix B of the contract) are divided into 3 Critical Outcomes, 11 underlying Objectives and 14 associated Performance Measures; all of which were developed jointly by BSA and DOE. The three Critical Outcomes are

- 1.0 Excellence in Science & Technology
- 2.0 Environmental Restoration
- 3.0 Laboratory Management and Operations

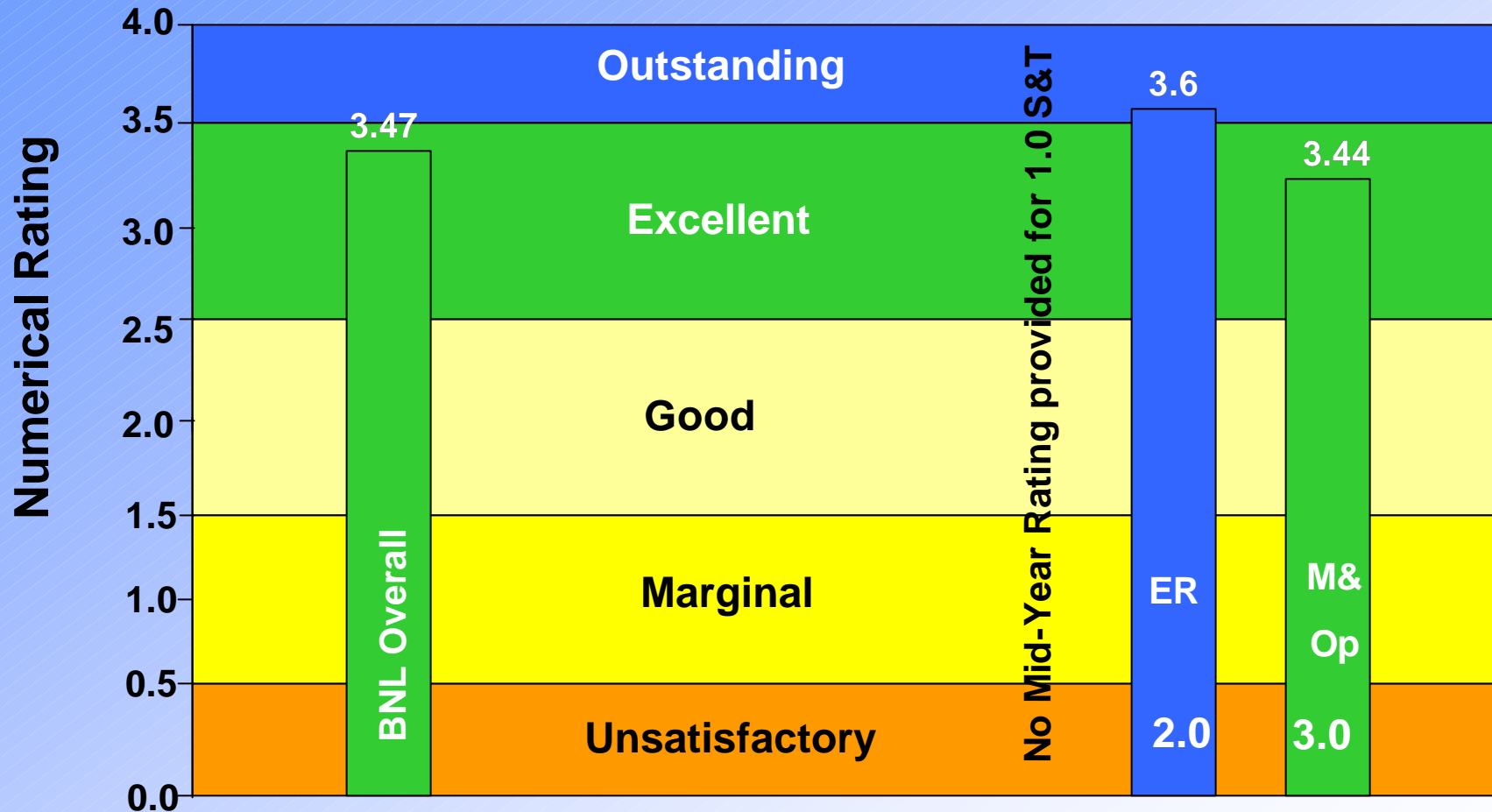
The contract requires that DOE establish an overall performance rating for BSA twice each year. The mid-year rating, presented in this document, is BSA's self-evaluation. The "scoring" system utilized in generation of this report is also defined in Appendix B of the Prime Contract. For Critical Outcome 1.0, Excellence in Science and Technology, a self-evaluation has been performed for each of the four science directorates. However, an actual numerical rating will only be provided with the year end report.

It is projected that the overall year-end rating for Critical Outcome 1.0 will be "Outstanding". The mid-year rating for Critical Outcome 2.0 (Environmental Restoration ) is 3.6 and for Critical Outcome 3.0 (Laboratory Management and Operations) is 3.44. The Laboratory overall is illustrated in the graph. BSA has determined that the overall performance is a numerical rating of 3.47 with a corresponding adjectival rating of "Excellent". It is projected that for the year-end report the adjectival rating of OUTSTANDING will be achieved.

The evaluation supporting the mid-year rating is detailed in this report.

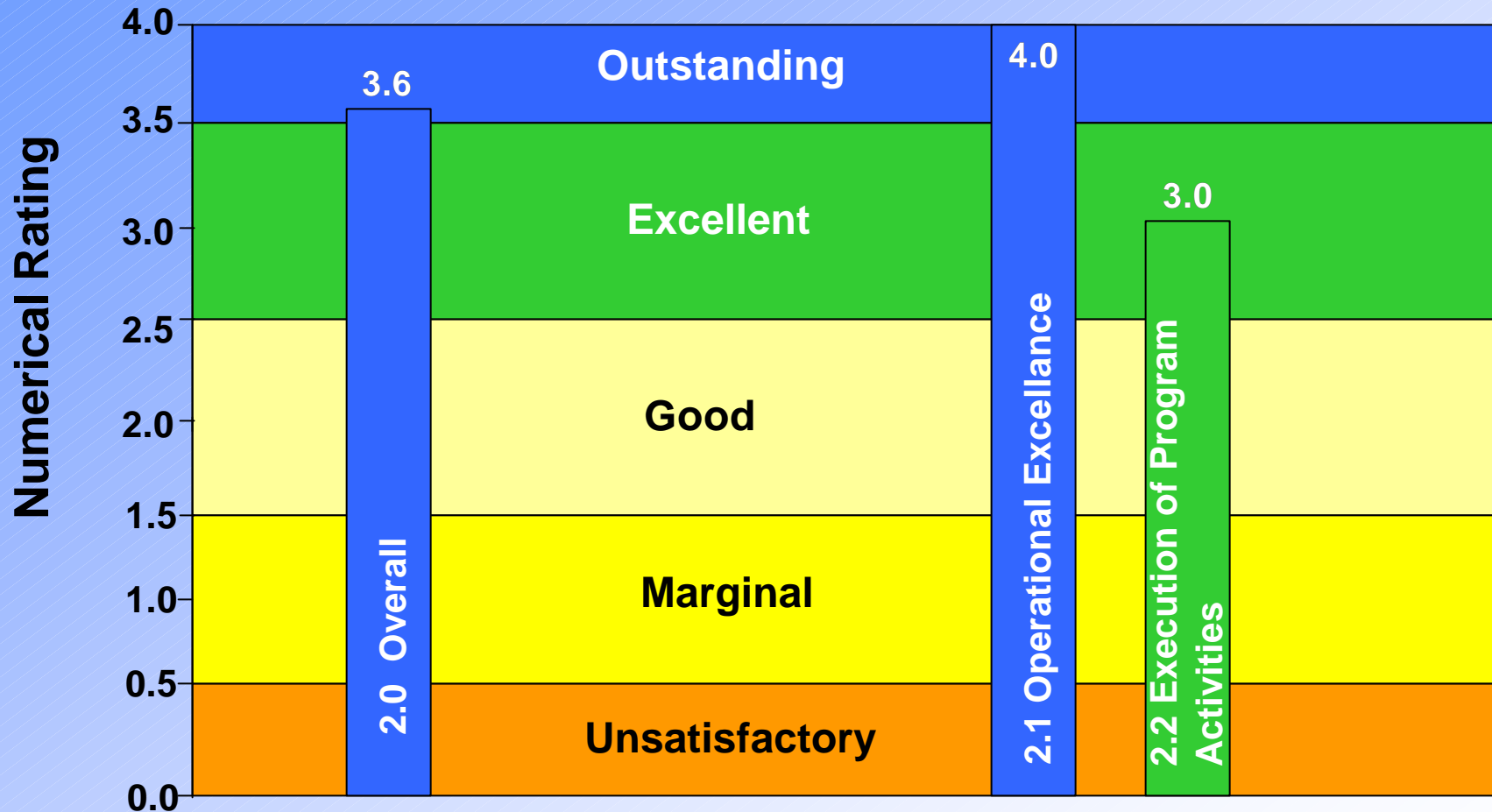


# Overall BNL Performance FY 2002 Mid-Year



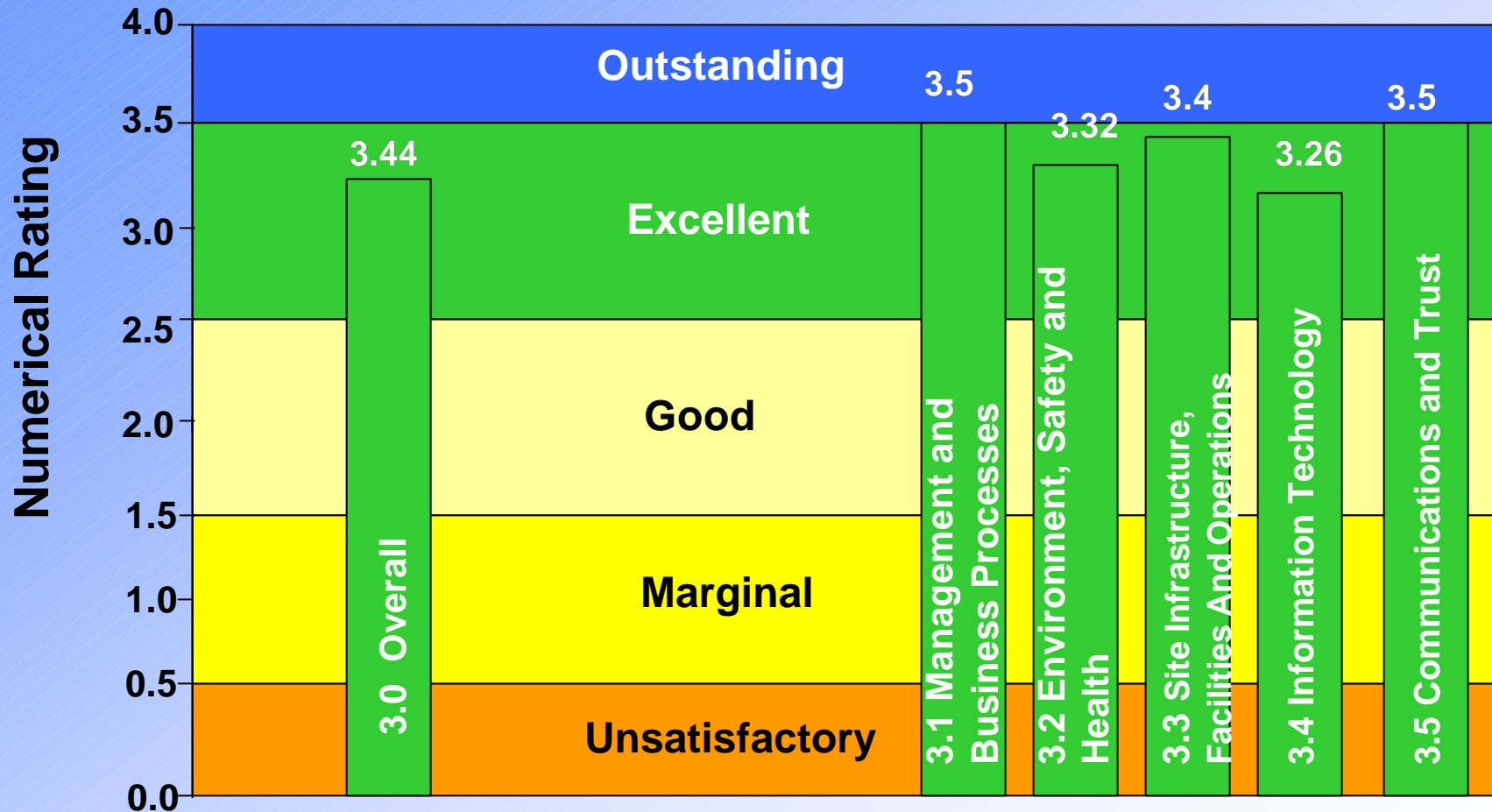
FY02 Mid-Year

# Critical Outcome 2: Environmental Restoration



FY02 Mid-Year

# Critical Outcome 3: Management and Operations



FY02 Mid-Year

# 1.0 Basic Science & Technology

## Critical Outcome

## Objectives

## Performance Measures

1.0

BNL will deliver innovative, forefront science and technology aligned with DOE strategic goals in a safe, environmentally sound, and efficient manner and will conceive, design, construct, and operate world-class user facilities.

60% of BNL Score

1.1

Quality of Research

35% of C.O. #1

1.2

Relevance to DOE mission and national needs

10% of C.O. #1

1.3

Success in Constructing and Operating Research Facilities

30% of C.O. #1

1.4

Effectiveness and efficiency of research program management

25% of C.O. #1

### 1.1.1 High Energy and Nuclear Physics

- Determine the quality of the High Energy and Nuclear Physics Research performed for FY 2000

### 1.1.2 Basic Energy Sciences

- Determine the quality of the Basic Energy Sciences Research performed for FY 2000

### 1.1.3 Life Sciences

- Determine the quality of the Life Science Research performed during FY 2000

### 1.1.4 Energy, Environment & National Security

- Determine the quality of the Energy, Environment, and National Security Research performed during FY 2000

### 1.2.1 High Energy and Nuclear Physics

- Determine if the High Energy and Nuclear Physics research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.2 Basic Energy Sciences

- Determine if the Basic Energy Science research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.3 Life Sciences

- Determine if the Life Science research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.4 Energy, Environment & National Security

- Determine if the Energy, Environment & National Security research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

# 1.0 Basic Science & Technology

## Critical Outcome

## Objectives

## Performance Measures

1.0

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10% of C.O. #1

1.3

Success in Constructing and Operating Research Facilities

30% of C.O. #1

1.4

Effectiveness and efficiency of research program management

25% of C.O. #1

### 1.3.1 High Energy and Nuclear Physics, 1.3.2 Basic Energy Sciences, 1.3.3 Life Sciences, 1.3.4 Energy, Environment & National Security

- Performance specifications and objectives
- Reliability and safety of operation achieved
- Adherence to planned schedules
- Cost effectiveness of maintenance and facility improvements
- Assess new facilities design and development
- Effectiveness of user access program

### 1.3.5 SNS-Spallation Neutron Source Project

- Reviewers will consider the extent to which BNL provides effective and efficient leadership in the development of the Spallation Neutron Source (SNS) Project. In this project the Laboratory will perform assigned tasks and produce scheduled deliverables for the Spallation Neutron Source in accordance with the Inter-lab Memorandum of Agreement (MOA) and the approved annual work plans.

### 1.4.1 High Energy and Nuclear Physics

- Determine the effectiveness and efficiency of High Energy and Nuclear Physics research program management.

### 1.41.2 Basic Energy Sciences

- Determine the effectiveness and efficiency of **Basic Energy Sciences** research program management.

### 1.4.3 Life Sciences

- Determine the effectiveness and efficiency of **Life Sciences** research program management.

### 1.4.4 Energy, Environment & National Security

- Determine the effectiveness and efficiency of Energy, Environment & National Security research program management.

# 2.0 Environmental Restoration

## Critical Outcome

2.0

BNL Will Deliver “Best-In-Class” Solutions In Conducting The Environmental Restoration Program. Focused Upon Completion, The Results Will Be Protective Of The Environment, Cost Effective, And Performed In An Open Exchange With The Community, Our Regulators, And Other Stakeholders. BNL Will Continue To Keep The Commitments Agreed To In The Memorandum Of Understanding Signed By Dr. Marburger And Mr Holland On May 4, 2001.

8% of BNL Score

## Objectives

2.1

**Operational Excellence in Environmental Restoration**

60% of C.O. #2

2.2

**Execution of Program Activities**

40% of C.O. #2

## Performance Measures

### **2.1.1 On Time Starts of Major Projects (100% of 2.1)**

BSA will be evaluated on the quality of work planning and schedule management via the achievement of schedule start dates for major projects. The identification and start dates are mutually agreed to with BAO.

### **2.2.1 Cost Performance (50% of 2.2)**

BSA will be evaluated on its cost effective performance management of the baseline for FY 2002.

Cost Performance Index = (Budgeted Cost of Work Performed)/(Actual Cost of Work Performed)

### **2.2.2 Schedule Performance (50% of 2.2)**

BSA will meet and accelerate all primary, secondary and removal action milestones scheduled under the Interagency Agreement (IAG) as agreed upon with the U.S. EPA and NYSDEC and all Level 1, 2A, and 2B Milestones. These are listed in Table 1. Additionally, BSA will accelerate out-year milestones to demonstrate superior schedule performance.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

3.1

**Management and Business Processes**

55% of C.O. #2

3.2

**Environment, Safety and Health**

15% of C.O. #2

3.3

**Site Infrastructure, Facilities and Operations**

10% of C.O. #2

3.4

**Information Technology**

10% of C.O. #2

3.5

**Communications and Trust**

10% of C.O. #2

### 3.1.1 Assessment and Improvement (70% of 3.1)

#### 3.1.1.1 Overall Evaluation of the Laboratory Self-Assessment Program

BSA will coordinate and conduct an overall evaluation of the Laboratory's Assessment Program. The evaluation team will include DOE representatives (BAO and others selected by BAO), BSA Representatives and "peer reviewers" from other Laboratories.

#### 3.1.1.2 Enhance Evaluation of Management Systems

A Management System Evaluation consists of the following:

- Establishment of an evaluation team.
- Development of an Information Package about the performance and operation of the management system
- Conducting an Evaluation Workshop to score the maturity of the MS.
- Generation of a report documenting the evaluation process and results.

### 3.1.2 Business Processes (25% of 3.1)

#### 3.1.2.1 Baseline Study of Laboratory Business Systems

This measure is focused on an effort to baseline/benchmark management processes and systems to identify the set of indicators that collectively can be used to evaluate the ongoing effectiveness and efficiency of the Laboratory business related management systems.

#### 3.1.2.2 Work-for-Others Business Systems

These measures are focused on improving the billing system and the development of a database that will be shared between the DOE/BAO and the Laboratory in accordance with the Office of Science's 2001 Report and in accordance with BNL's FY 2001 Self-Evaluation of WFO-Federal.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

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10% of C.O. #2

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**Information Technology**

10% of C.O. #2

3.5

**Communications and Trust**

10% of C.O. #2

### 3.1.3 Workforce/Diversity (2% of 3.1)

This measure serves to ensure the Workforce Diversity initiatives are effective in ensuring the availability of viable diversity candidates in the pool of individuals applying for managerial and professional positions.

### 3.1.4 Corporate Involvement (3% of 3.1)

Brookhaven Science Associates believes that active corporate involvement is a critical success factor in the management of BNL. To implement this, BSA is committed to the following types of activities at BNL:

- Providing highly skilled candidates for senior management positions at the Laboratory.
- Providing proven management systems and processes for enhancing business operations.
- Facilitating the implementation of these with long-term assignments of key leaders and short-term assignments of subject matter experts.
- Conducting management assessments in various areas of Laboratory operations.
- Providing strategic guidance to the science, technology and cleanup missions of the Laboratory.
- Facilitating the exchange of ideas and practices between other organizations affiliated with BSA corporate partners that bring benefits to DOE and/or BNL.



# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

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55% of C.O. #2

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Environment, Safety and Health

15% of C.O. #2

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Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### **3.2.1 Legacy ES&H Risk Management (30% of 3.2)**

#### **3.2.1.1 Site Hazard Footprint Management**

This measure is intended to begin establishing a "hazard footprint" for conditions that are not directly related to achieving the Laboratory mission and have not been transitioned to EM for disposition/ resolution. The focus will be on establishing the footprint for radiological hazards.

#### **3.2.1.2 Chemical Disposition Upon Employee Termination**

This measure is focused on evaluating the adequacy and effectiveness of termination processes which contain checks to ensure transfer of responsibilities for the management of chemicals when employees are terminated.

### **3.2.2 On-going ES&H Risk Management (70% of 3.2)**

#### **3.2.2.1 Pollution Prevention**

Each organizational unit must demonstrate active involvement in the BNL Pollution Prevention Program. "Demonstrating involvement" is evidenced by submitting at least two pollution prevention project proposals to the P2 Council and/or two success stories and/or lessons learned stories.

#### **3.2.2.2 Transportation Safety Implementation**

The purpose of this measure is to satisfactorily complete key milestones associated with field deployment/implementation which are scheduled for FY02, and prepare the Laboratory for a DOE independent assessment of the Transportation Safety Program required by DOE Order 460.2.

#### **3.2.2.3 OSHA Reportable Injury Management**

BNL will seek to improve the following reportable rates: Total Recordable Case Rate (OSHA Recordables) TRCR, Lost Workday Case Rate (LWCR) and Lost Work Day Rate (LWDR)

#### **3.2.2.4 Chemical Safety Performance**

This measure is intended to evaluate the effectiveness of those processes and tools in managing chemical risks

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

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Environment, Safety and Health

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3.3

Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### 3.3.1 Pursue Alternative Financing for Infrastructure Projects (30% of 3.3)

BSA will continue to evaluate whether "third-party" (non-DOE) project funding is available, feasible and should be used to meet selected infrastructure needs.

### 3.3.2 Project Management (70% of 3.3)

BSA will manage its construction and construction-like projects to ensure scope, schedule and cost objectives are readily met.

This performance measure is for all capital-funded construction projects, excluding Strategic Systems (formerly Major Projects and Major Systems Acquisitions) and EM Projects. It is measured as a composite that accounts for the percent of capital funds committed and costed per fiscal year, the percent of projects on schedule, and the number of capital construction projects with scope completed within the Total Estimated Cost (TEC). The formula for calculating the performance is:

PROJECT RATING (PM):  $(PM) = 0.2 (a^1 + a^2) + 0.2 (b^1 + b^2) + 0.2 (c)$

**3.3.2.1 Funds Committed(a1)**

**3.3.2.2 Funds Costed (a2)**

**3.3.2.3 Project Schedule Compliance (GPP and IHEM) b1**

**3.3.2.4 Project Schedule Compliance (Line Item) b2**

**3.3.2.5 Scope Completed Within Approved Baseline (Line Item, GPP and IHEM) (c)**

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

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Information Technology

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Communications and Trust

10% of C.O. #2

### 3.4.1 Cyber Security (55% of 3.4)

BNL will maintain/improve a Cyber Security program that is designed to protect the unclassified portion of the computing and networking infrastructure from attacks originating from inside or outside the Laboratory, based on: social engineering, physical destruction of network components, or electronic attacks utilizing the network and the Internet. The program must balance the need for openness and the science mission against the security required to reduce the threats to acceptable levels. Two elements of this measure are:

- Completion of the Laboratory's computer security program according to DOE guidelines and directives, and as documented in BNL's Cyber Security Program Plan (CSPP).
- Establishing mechanisms to test, review and evaluate the CSPP to ensure it's value as a "living document;" as such, it will continue to meet the rapidly evolving cyber security risks, with response to external/internal threats balanced appropriately against the needs of the Laboratory science mission.

### 3.4.2 Scientific Computing Infrastructure (45% of 3.3)

BNL will continue to develop and maintain a scientific computing infrastructure that is fully supportive of the Laboratory's scientific mission, focusing on those areas where leveraging existing expertise and local/regional collaborations can produce significant improvement over the current status. This includes:

- Strengthening and upgrading the existing Visualization Program to address the visualization and data analysis requirements for the major BNL scientific initiatives—in particular, for RHIC and ATLAS.
- Strengthening and upgrading the scientific computing resources present in the BNL Computing Facility (BCF), to provide strategic value to the major scientific programs at the Laboratory, as well as to local/regional collaborations.
- Inaugurating a program of New Technology Implementation Assessments (NTIAs). Within this program, a specific new information technology will be investigated for a given Laboratory program/application, by mutual agreement with program/application owner.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

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Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

The Laboratory will enhance the foundation of trust and confidence it has built by: strengthening existing relationships and building new relationships with key stakeholders, elected and appointed officials, civic leaders, and other important constituencies; effectively communicating the Laboratory's scientific initiatives and accomplishments; generating community enthusiasm for Laboratory research programs; and working to fulfill the education mission shared with DOE.

### 3.5.1 Building Regional and National Recognition (50% of 3.5)

The objective of this measure is to increase regional and national recognition of the Laboratory and the Department of Energy. Strategic issues include enhancing the effectiveness of Laboratory communications with internal and external publics, showcasing the results of Lab research with special emphasis on RHIC and other high profile initiatives that produce exciting and scientifically interesting new information, building relationships with the press, and developing and improving the Laboratory's use of electronic media.

### 3.5.2 Stakeholder Involvement and Understanding (50% of 3.3)

The Laboratory is committed to ensuring that internal and external stakeholders have access to information about issues of interest and concern, and to providing two-way channels of communication so that stakeholders feel there is a frank and open dialogue with Laboratory management on issues of importance. Responsibility for stakeholder involvement on specific projects rests primarily with the project line manager with strong support from the Laboratory in terms of issues identification, community involvement training programs, information materials development, communications activities such as meetings and roundtables, collection and evaluation of community input, and feedback to the community.

# 1.0 Basic Science & Technology

## Critical Outcome

## Objectives

## Performance Measures

1.0

BNL will deliver innovative, forefront science and technology aligned with DOE strategic goals in a safe, environmentally sound, and efficient manner and will conceive, design, construct, and operate world-class user facilities.

60% of BNL Score

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Quality of Research

35% of C.O. #1

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Relevance to DOE mission and national needs

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Success in Constructing and Operating Research Facilities

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### 1.1.2 Basic Energy Sciences

- Determine the quality of the Basic Energy Sciences Research performed for FY 2000

### 1.1.3 Life Sciences

- Determine the quality of the Life Science Research performed during FY 2000

### 1.1.4 Energy, Environment & National Security

- Determine the quality of the Energy, Environment, and National Security Research performed during FY 2000

### 1.2.1 High Energy and Nuclear Physics

- Determine if the High Energy and Nuclear Physics research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.2 Basic Energy Sciences

- Determine if the Basic Energy Science research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.3 Life Sciences

- Determine if the Life Science research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

### 1.2.4 Energy, Environment & National Security

- Determine if the Energy, Environment & National Security research fits within and advances the missions of DOE; contributes to U.S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science & Technology programs.

# 1.0 Basic Science & Technology

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Effectiveness and efficiency of research program management

25% of C.O. #1

### 1.3.1 High Energy and Nuclear Physics, 1.3.2 Basic Energy Sciences, 1.3.3 Life Sciences, 1.3.4 Energy, Environment & National Security

- Performance specifications and objectives
- Reliability and safety of operation achieved
- Adherence to planned schedules
- Cost effectiveness of maintenance and facility improvements
- Assess new facilities design and development
- Effectiveness of user access program

### 1.3.5 SNS-Spallation Neutron Source Project

- Reviewers will consider the extent to which BNL provides effective and efficient leadership in the development of the Spallation Neutron Source (SNS) Project. In this project the Laboratory will perform assigned tasks and produce scheduled deliverables for the Spallation Neutron Source in accordance with the Inter-lab Memorandum of Agreement (MOA) and the approved annual work plans.

### 1.4.1 High Energy and Nuclear Physics

- Determine the effectiveness and efficiency of High Energy and Nuclear Physics research program management.

### 1.41.2 Basic Energy Sciences

- Determine the effectiveness and efficiency of **Basic Energy Sciences** research program management.

### 1.4.3 Life Sciences

- Determine the effectiveness and efficiency of **Life Sciences** research program management.

### 1.4.4 Energy, Environment & National Security

- Determine the effectiveness and efficiency of Energy, Environment & National Security research program management.

# FY 2002 Mid-Year Self-Evaluation

## 1.0 Excellence in Science & Technology

*BNL WILL DELIVER INNOVATIVE, FOREFRONT SCIENCE AND TECHNOLOGY ALIGNED WITH DOE STRATEGIC GOALS IN A SAFE, ENVIRONMENTALLY SOUND, AND EFFICIENT MANNER AND WILL CONCEIVE, DESIGN, CONSTRUCT, AND OPERATE WORLD-CLASS USER FACILITIES.*

*The weight of this Outcome is 60% of total.*

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*Cognizant DOE Assistant Secretaries and Office Directors have primary responsibility for evaluating the performance of Laboratory Science and Technology programs. In carrying out this responsibility, the Assistant Secretaries and Office Directors are likely to request assistance from the Program Managers under whose jurisdiction the various individual Laboratory programs fall.*

*In performing this evaluation, the Assistant Secretaries and Office Directors have available input from the following sources:*

*DOE Program Managers who carry out periodic reviews of the programs they fund. These reviews usually include use of independent technical experts. The Program Managers may use written reviews as a basis for evaluating the quality of the science and technology performed by the Laboratory and its relevance to their programmatic goals.*

*The Science and Technology Advisory Committee of the BSA Board that oversees the internal reviews of science and technical programs at Brookhaven. Independent review committees whose membership is drawn from the external scientific and engineering communities review each major Laboratory program on an 18-month cycle. The committees evaluate Laboratory divisions and programs with respect to the quality and performance of the staff, the quality and timeliness of the work, and the relevance of the programs to the goals of the Laboratory and sponsoring agencies. Reviews include consideration of the Performance Measures described below. The Committees' written reports and the Laboratory's responses are made available to the BSA Board for Brookhaven, DOE Contracting Officers, and to relevant DOE Program Managers.*

*In addition, input from Advisory Committees reporting to the cognizant DOE Assistant Secretary or Office Director that are appointed formally through the Federal Advisory Committee Act, from reviews of relevant Laboratory activities requested for the Secretary of Energy, or from cognizant Assistant Secretaries and Office Directors may be used.*

*BNL Self-Assessments, which include Department Self-Assessments, Independent Peer Review, and Department and Lab-level Annual Self-Evaluations.*

## High Energy and Nuclear Sciences

### Significant Accomplishments in High-Energy and Nuclear Physics

#### *Nuclear Physics*

Brookhaven's Nuclear Physics Program is dominated by the operation of the RHIC Facility for a worldwide scientific community of more than one thousand researchers in relativistic heavy-ion physics. RHIC is a unique facility and, having successfully completed its first run in 2000, now is reaching its full design potential. Numerous researchers are generating a very strong flow of important scientific papers. The most recent DOE review of the RHIC scientific program declared the program to be, in a word, "spectacular". In-house research groups in experimental- and theoretical- nuclear physics support the RHIC program, offering scientific leadership for the RHIC community and facilitating the participation of scientific users from all over the world. The following are some of the achievements attained so far in FY02:

- The first full-energy, design-luminosity Au x Au colliding beams were achieved in fall 2001, realizing the design promise of the RHIC collider; progress in making the machine available and increasing its luminosity will be the goal of our continuous improvements in future years;
- The polarized proton colliding beams in RHIC were commissioned in late 2001 and all four RHIC detectors captured the first physics data. The pp2pp elastic-scattering experiment was commissioned and made its first measurements of pp elastic scattering at 100 GeV in each beam during the polarized proton run; the stability and magnitude of the beam's polarization will be improved during the next two years by replacing the present AGS polarization-preserving magnet by a RHIC-type helical dipole;
- RHIC experiments produced a steady stream of important scientific papers, many published in the premier journal, Physical Review Letters (PRL); in the first half of FY 2002, eight papers were published, of which five appeared in this journal, An additional 10 papers have been submitted, eight of them to PRL, while 16 more are in preparation for submission later in FY 2002. Dozens of RHIC-related papers were presented in national and international conferences and workshops. RHIC is making the strongest scientific impact within the entire field of nuclear physics;
- Among the many new scientific findings from RHIC, the most surprising are the HBT measurements that show a very marked constancy with energy of the 'freeze-out radius' of mesons and baryons produced in central Au x Au collisions. No current theory can explain this effect while preserving consistency with other known RHIC phenomena;
- The size and influence of the theory group in nuclear physics, members of the Laboratory's Physics Department and the Riken -BNL Research Center has grown during FY 2002. Its impact has been felt in the worldwide nuclear-physics community by our participation in many conferences and workshops, four of which were held at Brookhaven in the first half of FY 2002.



## *High-Energy Physics*

Brookhaven's High-energy Physics (HEP) Program focuses on four main areas: LHC frontier energy physics; rare kaon plus and rare precision muon processes; Tevatron discovery physics; and, particle theory. The LHC effort centers around The Laboratory's dual role as the Host Laboratory for all U.S. scientists participating in the ATLAS Detector Collaboration (~20% of the worldwide total) and our leadership of the U.S. ATLAS Detector Construction and Computing Projects. Research on rare kaon and muon processes centers on the AGS fixed-target facility. The AGS is expected to be the site of a future NSF Major Research Equipment (MRE) Project called 'Rare Symmetry Violating Processes' (RSVP), a path-breaking experimental program also based on rare kaon and muon decays. Brookhaven's work at Fermilab includes several leading roles in the D0 Experiment that currently is collecting data at the highest energies of any world accelerator. For many years, the Theory Group has been one of the leaders in the United States and it continues to provide national leadership in several of the most important areas of theory development. Brookhaven's successes in FY02 include the following:

- The LAr Cryostat for ATLAS was completed, including Laboratory -produced HV- and signal feedthrough modules that bring 100K connections from the liquid argon calorimeter to room temperature. These modules were successfully welded into place in the cryostat in FY 2002;
- The production of 'Cathode Strip Chambers' (CSCs) for ATLAS commenced at Brookhaven in FY 2002. They will give the ATLAS detector the important capability for tracking small angle particles;
- The Project Office of U.S. ATLAS at The Laboratory completed another year of successfully managing the U.S. ATLAS Detector and Computing Projects and now is organizing the U.S. role in managing the Commissioning and Integration (C&I), Maintenance and Operations (M&O) and Upgrade R&D phases of the DOE's ATLAS Research Program;
- The E787 rare kaon experiment at the AGS revealed a second decay of the important rare process,  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ ; this notable achievement was published in the January issue of Physical Review Letters and was featured on its front cover; the successor experiment, E949 now is taking data at the AGS and we hope to see a tenfold improvement on the yield of E787;
- The DOE President's Budget showed that the AGS was no longer operating for HEP in FY 2003; worldwide reaction from the HEP community may motivate Congressional action to restore its operation;
- R&D progress in the RSVP initiative continued with the NSF strongly supporting the participating universities; the MRE project for RSVP currently is anticipated to begin in FY 2003 or FY 2004;
- the effort to create software for a QCD 'Lattice Gauge Center' (LGC) located at Brookhaven started in FY 2001 and has continued into FY 2002 with funding from the DOE's SciDAQ program; the formal proposal submitted to the DOE for initiating the LGC by acquiring computing hardware using the QCDOC advanced computer-on-a-chip (being developed cooperatively by Columbia University and IBM) will transpire in FY 2002. When completed in FY 2004, the LGC will serve all members of the U.S. lattice-gauge- physics community,

and be the most powerful facility in the world for this important new enterprise in particle physics theory.

### **Initiatives**

The growing importance of neutrino physics to particle- and nuclear-physics research has stimulated Brookhaven's neutrino physicists and others in the U.S.HENP community to initiate an intensive study of the potential of the Alternating Gradient Synchrotron (AGS). The AGS holds high promise as an optimum source of very high intensity neutrinos for a program of next-generation oscillation and CP-violation physics through its ability to deliver broad- and moderate-band neutrino beams in the 1GeV energy band from production targets of up to 2 MW. Such a source of neutrinos would be competitive with any planned or contemplated neutrino venue in the world and could be established for much less than the capital amounts under consideration in other countries. The Laboratory has commissioned a full study that will capture the value of this proposed program in a document to be completed in summer 2002.

### **Prizes**

Two Brookhaven physicists won major science prizes in HENP in FY 2002. William Marciano won the prestigious J.J. Sakurai Prize of the American Physical Society, and Nicholas Samios won the international Pontecorvo Prize conferred by the Joint Institute for Nuclear Research at Dubna.

### **Other Projects**

The Collider-Accelerator Department (C-AD) at Brookhaven has contributed technically and in managing the Spallation Neutron Source (SNS) for DOE's BES Division. In particular, C-AD is responsible for the Accumulator Ring and connecting beamlines for this major DOE construction project. Our portion of the project continues its record of on-time and on-budget provision of deliverables. This project will be completed in FY 2004.

The C-AD also is managing the construction of the Booster Applications Facility (BAF) project for NASA's Radiobiology Program at The Laboratory. When it is complete in FY 2003, the BAF will join the AGS as a source of high-energy ion beams (Fe and Si) for this continuing radiobiology program. The BAF project also is on-schedule and within-budget and will deliver all the planned capability for the radiobiology work for NASA.

## **Basic Energy Sciences**

### **Significant Accomplishments in Basic Energy Sciences**

The NSLS continues to be one of the most heavily used of the DOE's synchrotron light sources; the number of users continues to expand (~2800) as does their disciplines. The Laboratory is committed to enhancing the facility's role as a national resource for materials-, chemical-, and biological-research. In the past six months, a vigorous effort was made to explore methods of supporting users by improving access to the full range of synchrotron-based experimental techniques for specific programs in materials- and chemical-sciences. The first example is a pilot

program in catalytic chemistry, to be followed by others, possibly including soft matter, high-pressure studies and high magnetic fields. A proposal to construct an upgraded, high-brightness light source is being prepared for submission in summer 2002.

Brookhaven was very active throughout the last six months in establishing a major nanoscience program. The theme for this program is “tailoring” the physical- and chemical-responses of nanoscale functional materials. Scientific work started on two new programs: Catalytic Nanomaterials, and Charge Transfer at the Nanoscale. Furthermore, three new NSET proposals recently were submitted addressing magnetic nanoassemblies, metal- and alloy-nanoparticle electrocatalysts, and nanotemplate-directed assembly of soft matter and biomaterials. Our initial proposal for a Nanocenter in March of 2001 was declined; however, a new proposal was submitted in November 2001, again focusing on functional materials, but aligning the research program more closely to nanoscience.

The Laboratory held a major workshop on March 8<sup>th</sup> and 9<sup>th</sup> for the Center for Functional Nanomaterials (the “Nanocenter”) held a major workshop on March 8<sup>th</sup> and 9<sup>th</sup> at Brookhaven. It was an unqualified success, attracting over 400 attendees, representing 80 or more U.S. institutions, from 21 states, and three international visitors. In addition to presenting our strong technical program, our goal was to bring together representatives from academia, industry, and government to discuss the role of the Nanocenter in the Northeast region and to solicit advice and comments upon instrumentation, operational principles, and science. . The initial feedback was very positive, and we were very impressed with the strong showing of interest in a Brookhaven Nanocenter. The input from the workshop participants is greatly appreciated and will be used during the conceptual design phase for the Center.

On February 13, 2002, the Brookhaven Deep Ultra-violet Free Electron Laser (DUV-FEL) facility reached an important milestone on the way to its ultimate goal, the production of 100 nm laser light by the process of High Gain Harmonic Generation (HGFG). The DUV-FEL produced laser light at 400 nm at unexpected levels by the process of Self Amplified Spontaneous Emission (SASE). The performance of the DUV-FEL gives researchers confidence that the goal of 100 nm is indeed attainable.

A theory was developed of Mott-insulator—metal transitions in a quasi-one-dimensional metal. It treats the single-chain electron Green's function non-perturbatively and the interchain tunneling in RPA, and predicts a metallic state with a small Fermi surface (PRL, in press).

Correlation profiles of several complex networks were calculated, and shown to be similar; they include the correlation profiles of interacting proteins in yeast, and of the autonomous system connectivity of the internet. The general technique derived in this work can distinguish between designed (or evolved) and random features in a given network (Science, in press).

Transport measurements of the cubic perovskite-related material calcium copper titanium oxide ( $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ ) show that it has one of the highest known values of the static dielectric constant,  $\sim 100,000$ , at room temperature. However, it drops by a factor of 1000 below 100 K without any change in the long-range crystallographic structure. Optical measurements provided the first clues both to its high value, and to the mechanism behind this sudden decrease at low temperature [Science 293, 673 (2001)].

The high conductivity of the high-temperature superconductor  $\text{La}_{2-x}\text{Sr}_x\text{CuO}$  is achieved by doping holes into an antiferromagnetic parent compound. Neutron-diffraction studies of a series of single crystals established that in the doping regime between the antiferromagnetic and superconducting phases, the magnetic moments on copper atoms become ordered within local antiferromagnetic domains with the antiphase domain walls oriented diagonally with the Cu-O planes. On doping into the superconducting phase, the domain walls rotate to become parallel with one of the directions of the Cu-O bonds [Phys. Rev. B 65, 064505 (2002)].

Ferroelectric relaxor compounds, the basis for actuators and transducers with superior piezoelectric properties, are characterized by nanoscale domains that have a randomly oriented dielectric polarization. Inelastic neutron-scattering measurements demonstrated that the polar nanodomains very strongly dampen transverse optical phonons with wavelengths longer than the characteristic size of the nanodomains [Phys. Rev. Lett. 87, 277601 (2001)].

The combined theoretical and experimental study on  $\text{MgB}_2$  has revealed nearly isotropic mechanical- and BCS-like-behavior under pressure [Phys. Rev. B 63, 220505(R) (2001)].

Inelastic x-ray scattering studies of the electronic excitation spectrum of the 2D cuprate  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  showed that the gap excitation consists of two modes, both of which are two-dimensional. In the doped,  $x=0.17$ , compound, the gap was “filled in” and the lower energy excitation washed out, indicative of the “bad” metallic state. (submitted to PRL).

We have begun to explore x-ray reflectivity of liquid wetting phenomena on nanopatterned substrates. We found that as the temperature difference between the liquid film and its vapor decreased, the film’s thickness increased from  $\sim 1$  to  $\sim 10$  nm. Interestingly, the rate of growth initially was much smaller than expected for van der Waals interactions, but then crossed over to a much faster rate. The crossover thickness was comparable to the depth of the nanopits.

The activation of gold on Titania was achieved; this nanoscience success is related to the adsorption and reaction of  $\text{SO}_2$  on  $\text{Au}/\text{TiO}_2(110)$ . Bulk metallic Au and  $\text{TiO}_2$  exhibit a low reactivity for the dissociation of  $\text{SO}_2$ . Au nanoparticles supported on  $\text{TiO}_2$  are almost 10 times more reactive towards  $\text{SO}_2$  than are commercial catalysts for  $\text{SO}_2$  oxidation. Interactions with titania electronically perturb gold, making it chemically more active. Gold, in turn, enhances Titania’s reactivity by facilitating the migration of O vacancies from the bulk of the oxide to its surface (JACS, in press).

Theoretical work on the thermal-, photo-, and radiation-induced reactions in the Condensed Media program has enabled us to model charge transport through molecular assemblies over tens of nanometers (nm) by using combined classical and semi-classical kinetic models, and all-electron quantum chemical computational techniques.

PET imaging of enzyme activity fostered the development of the first radiotracers for imaging MAO in the peripheral organs of humans, providing the methodology for assessing the effects of smoking on organs other than the brain. Monoamine oxidase (MAO) occurs in almost every organ in the body and plays a role in breaking down blood-pressure elevating substances in many

foods and drugs. MAO in the brain is inhibited by cigarette smoke, raising the question of whether it is also inhibited in peripheral organs.

MRI scientists made significant advances defining and refining the concept of the "NMR Shutter-Speed", the criterion that determines whether an equilibrium process *appears* fast or slow in a given NMR (nuclear magnetic resonance) experiment. This finding is particularly important for studying biological tissue *in vivo*, where, in general, the investigator cannot change the *kinetics* of interesting processes. Thus, varying the NMR shutter-speed is the only way to measure such kinetics.

We demonstrated that a major source of electrochemical pitting results from growth processes within pits, and not from the usually reported breakdown and repair of the passive oxides (Electrochem. And Solid\_State Letters, accepted).

A fast, stable algorithm was elaborated that solves the long-standing problem of "phase unwrapping" inherent in holography and many other interferometric techniques (Phys. Rev. Lett, submitted).

Experimental conditions were optimized and means developed to separate interfacial potential from bulk contribution to measure charge variation across grain boundaries in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$  and  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  superconductors, and p-n junctions using holography (JEOL News. 36E 2-9 2001; Phys. Rev. B).

Theory and modeling of the mechanics and statistical thermodynamics of stress, point defects, and charge distributions has led to a better understanding of grain boundaries and interfaces in cuprate superconductors (Phys. Rev. B, submitted).

## Life Sciences

### Significant Accomplishments in Life Sciences

#### *Medical Department*

Medical imaging and addiction studies remain the cornerstone of OBER (Office of Biological and Environmental Research) research at The Laboratory. This research mission creates great opportunities for collaborations and jointly funded initiatives with other agencies, principally the NIH. The following describes specific accomplishments in Radiotracer Chemistry and Neuroimaging using Positron Emissions Tomography (PET) and Magnetic Resonance Imaging (MRI):

- PET and microdialysis were used to continue the first comprehensive study of solvent abuse (the most frequent form of abuse in children) in living systems, beginning with the pharmacokinetic and pharmacodynamic effects of toluene, the solvent most widely abused.
- The experimental medication, gamma vinyl GABA (GVG), which has shown great promise in diminishing addictive behaviors in animals, was labeled with carbon-11 for the first imaging studies of its distribution and pharmacokinetics in primates.

- Drug abusers frequently relapse when they again encounter an environment where they formerly used the drug. We showed that exposure to environmental cues produces similar neurochemical changes to the drug itself, illustrating the powerful role that the environment plays on drug-related behavior.
- Aromatic amino-acids, which may accumulate in rapidly growing tumors, were labeled with carbon-11 for PET studies in primates to determine their utility as tracers for detecting cancer. D- and L-boronphenylalanine also were labeled with carbon-11 for investigations of amino-acid transport, melanoma imaging, and BNCT therapy for brain tumors.
- The PET scanner designed for rats and mice (microPET), which was commissioned in FY 2001, was used by Brookhaven's scientists and outside collaborators as a new scientific tool for pre-clinical research to measure biochemical transformations and the movement of drugs in living animals. Two specialized PET devices were developed in FY 2002 to measure radiotracers in blood. One is a beta probe implanted in a blood vessel, and the other is a coincidence detector positioned external to the wrist to measure the concentration of positron emitters. Both promise to make PET studies simpler and safer.
- A collaboration was established to use the short-lived positron-emitting isotopes to study environmental stressors on plants.
- Progress continues on functional MRI studies using the BNL 4 Tesla scanner. The increased sensitivity resulting from last year's upgrade allow us to detect the passage of contrast agents across the blood-brain-barrier (BBB) in the white matter of the normal human brain.
- Brookhaven and Psimei Pharmaceuticals Ltd. continue to work together under a CRADA to develop Brookhaven-invented boron compounds for experimental radiation therapy for cancer, as well as other cancer treatments. In March 2002, our progress was measured in experiments at MIT.

### ***Biology Department***

The new DOE initiative "Genomes To Life" (GTL) provides an exciting focus for the expertise developed over many years in the Biology Department to understand basic principles of biological interactions both at the molecular level and within ecosystems comprised of microbes and higher forms of life. In response to the initial call for GTL proposals, a group of scientists from BNL and other National Laboratories and academic institutions submitted a joint proposal to develop cutting-edge, high throughput DNA sequencing methods to identify and quantify microbes in the environment, analyze gene expression profiles in microbes and plant roots within soil communities and track changes in gene expression in response to environmental stimuli and following contamination of soils with radionuclides or heavy metals. The development of these ultra sensitive sequencing methods will allow scientists to monitor microbial species that cannot be propagated as pure cultures in the laboratory and identify coordinately regulated genes that may define novel metabolic pathways responsive to environmental stress. The work is relevant to DOE's efforts to develop renewal resources for carbon management.

Subsequent calls for GTL proposals will focus on the major goal of characterizing interactions that enable proteins to function together as cooperative "molecular machines". This goal is strongly supported by Biology Department strengths in structural biology and protein expression

and its long experience with characterizing the biochemistry of protein complexes derived from bacterial, plant and mammalian cells. The Biology Department STEM and new CryoEM microscopy facilities also are well matched to the GTL objective of developing methods for imaging protein complexes in living cells or in fixed sectioned cells. Therefore, several areas of Biology Department expertise have excellent prospects to flourish under the GTL program as noted below:

- A new Membrane Protein Crystallographer hired as a staff member for the Center for Complex Protein Structure was awarded NIH funding to elucidate the structural basis for selective permeation of water and polyols through human aquaporins and aquaglyceroporins. Methods for characterizing of membrane proteins developed during the course of this project will support the long term GTL goal to elucidate the critical roles of membrane proteins in the function of cellular molecular machines. GPP funds were used to renovate laboratory space for this project.
- The Genome Group developed an improved method to acquire sequence data from regions of DNA that are refractory to analysis by standard methods. The new method uses transposon insertion to introduce regulatory elements into cosmid or BAC clones, enabling the clones to replicate to high copy number within bacterial host cells.
- A grant was submitted to the National Institutes of Health in collaboration with SUNY Stony Brook for a Center for Molecular Toxicology. This joint venture, involving thirty-six staff from the two institutions, would attempt to clarify the molecular- and cellular-mechanisms underlying the impacts of toxic agents on human health and the environment.
- A proposal was submitted to the DOE (OBER) to develop novel ligands for imaging molecular targets in vivo. The approach will use protein structure modeling and in vitro evolution methods to engineer new binding specificities into the receptor-binding protein of adenovirus. Earlier structural analysis showed that this viral protein interacts with its receptor through a highly efficient trivalent binding mechanism, a key property which will be exploited in the proposed project.
- A method was developed for identifying and qualitatively analyzing genomic DNAs (called Genomic Signature Tags) that provides limited representation of all the DNA molecules in a given population without any prior knowledge of the DNA sequence. This method could potentially be used to detect the presence of biological warfare agents in crude environmental samples. This same method also will be used in the GTL project to characterize the composition and dynamics of natural populations of microbes in normal and contaminated soil samples.
- An NIH proposal was submitted to explore, at biochemical and structural levels, how the adenovirus proteinase activity is regulated. Information gained from these analyses will then be used to design proteinase inhibitors which potentially could be used as antiviral agents.
- The Chair of the Biology Department participated in several DOE sponsored GTL computation workshops to define and develop the GTL Roadmap.
- The Chair and the Principal Investigator of the Scanning Transmission Electron Microscopy Facility were invited to join the steering committee for the DOE's GTL Imaging workshop (<http://gtlimaging.emsl.pnl.gov/proj/gtlimaging/index.html>).

- Several beamlines that comprise the Biology Department's crystallography facilities at the National Synchrotron Light Source underwent major upgrades.
  - Beamline X12B was reconfigured to upgrade the optics for high-flux, broad spectral band-pass operation with a multi-layer monochromator (for small-angle scattering and crystallography) and narrow-band-pass operation with a channel-cut crystal monochromator (for multi-wavelength anomalous diffraction crystallography).
  - The optics of Beamline X12C were upgraded to provide narrower band-pass, greater reliability, and an increased range of energies. .
  - A new motor control system was built and installed at Beamline X26C so that the beamlines optical elements could be reliably adjusted and the diffractometer properly aligned.
- Using the crystallography facilities at the NSLS, researchers from Rockefeller University visualized the conduction of potassium ions in cell membranes. These ion channels are particularly important in neurobiology, where electric currents transmit information over large distances.
- A patent application was filed on a method to increase protein solubility during overexpression in bacterial and other host cells. The method has been shown to increase the yield of properly folded protein within host cells, probably by inhibiting the aggregation of proteins during the folding process. Data supporting this patent application were acquired in a project supported by the BNL LDRD program.

## **Energy, Environment & National Security**

### **Significant Accomplishments in Energy, Environment & National Security**

#### *Energy Sciences and Technology Department*

- The Energy Information Administration selected the MARKAL-MACRO code as the model for the next World Energy Outlook report. MARKAL-MACRO is a technology specific, data-rich optimization model that provides least-cost energy system solutions under specified constraints to support policy and planning decisions.
- Systems to significantly reduce costs for producing and storing liquefied natural gas were demonstrated. They include assessing the production of Liquid Natural Gas from landfills, developing state-of-the-art storage tanks and refueling facilities, designing novel cryogenic-fuel delivery systems, and developing strategies for market end-use.
- The Laboratory initiated a major nonproliferation project with Kazakhstan. This project, in partnership with Global Nuclear Fuels and Nukem, will create an important supply of nuclear fuel to meet America's long-term energy demands.
- The Laboratory received an ER-100 award for inventing the Flame Quality Indicator, a device that alerts the homeowner when the oil-burner needs servicing. Honeywell Corporation and Insight Technologies is spearheading the commercialization of this device.
- Brookhaven, in collaboration with Caithness Operating Company of Reno, Nevada, won a 2001 R&D 100 Award for developing a technology to recover commercial-quality silica



from geothermal brine, a byproduct of geothermal-energy production. Retrieving this valuable product from brine which generally is disposed of as waste, makes energy production cheaper. Steps are being taken to commercialize the process.

### ***Nonproliferation and National Security Department***

- Brookhaven has the lead technical role in developing the transparency arrangements for the US/Russia high-enriched uranium (HEU) purchase agreement. Under this agreement, 500 metric tons of HEU from Russian nuclear weapons are being blended down to low enriched uranium (LEU) for peaceful use in nuclear reactors.
- The Murmansk Low-Level Radioactive Waste Treatment Plant in Russia was completely upgraded. This facility treats radioactively contaminated primary- coolant waters generated when dismantling Russian ballistic-missile launching submarines.

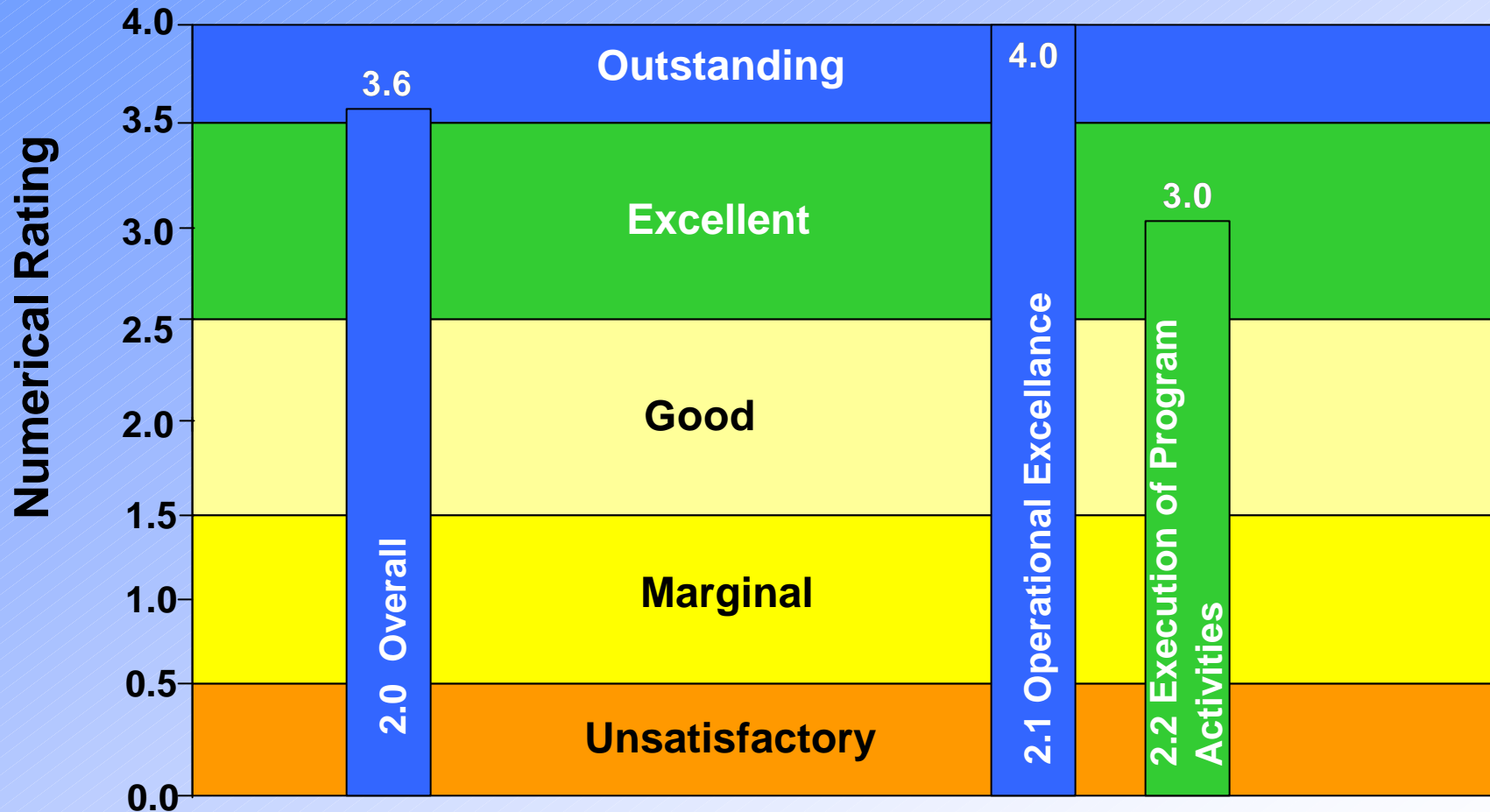
### ***Environmental Sciences***

- Scientific data were obtained on the ozone generation rate in the Houston area. They showed, for the first time, the relative contributions of industrial- and automobile-emissions.
- Satellite measurements and chemical-transport modeling were used to show the influence of anthropogenic aerosols on cloud optical depth. The results were consistent with the Twomey mechanism of indirect radiative forcing of climate by aerosols. We also developed new algorithms to retrieve aerosol properties from the moments of the particle-size distribution.
- Brookhaven's environmental researchers demonstrated that perfluorocarbon tracers are a cost-effective method to verify the integrity and to monitor the long-term performance of walls, floors, caps and cover systems.

### ***Center for Data Intensive Computing***

- CDIC developed numerical methods and new software to model the interactions of particle beams with electromagnetic (wake) fields in accelerators. CDIC also applied the magnetohydrodynamic code to understand the behavior of conducting liquid jets in magnetic fields and magnetohydrodynamic effects in the muon collider target.

# Critical Outcome 2: Environmental Restoration



FY02 Mid-Year

# 2.0 Environmental Restoration

## Critical Outcome

2.0

BNL Will Deliver “Best-In-Class” Solutions In Conducting The Environmental Restoration Program. Focused Upon Completion, The Results Will Be Protective Of The Environment, Cost Effective, And Performed In An Open Exchange With The Community, Our Regulators, And Other Stakeholders. BNL Will Continue To Keep The Commitments Agreed To In The Memorandum Of Understanding Signed By Dr. Marburger And Mr Holland On May 4, 2001.

8% of BNL Score

## Objectives

2.1

**Operational Excellence in Environmental Restoration**

60% of C.O. #2

2.2

**Execution of Program Activities**

40% of C.O. #2

## Performance Measures

### **2.1.1 On Time Starts of Major Projects (100% of 2.1)**

BSA will be evaluated on the quality of work planning and schedule management via the achievement of schedule start dates for major projects. The identification and start dates are mutually agreed to with BAO.

### **2.2.1 Cost Performance (50% of 2.2)**

BSA will be evaluated on its cost effective performance management of the baseline for FY 2002.

Cost Performance Index = (Budgeted Cost of Work Performed)/(Actual Cost of Work Performed)

### **2.2.2 Schedule Performance (50% of 2.2)**

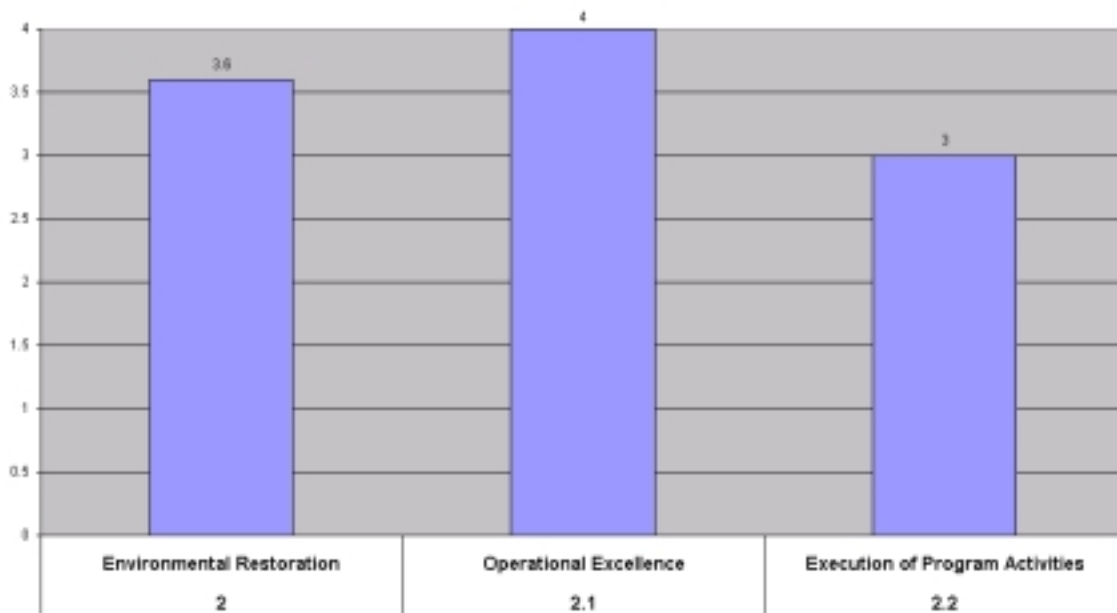
BSA will meet and accelerate all primary, secondary and removal action milestones scheduled under the Interagency Agreement (IAG) as agreed upon with the U.S. EPA and NYSDEC and all Level 1, 2A, and 2B Milestones. These are listed in Table 1. Additionally, BSA will accelerate out-year milestones to demonstrate superior schedule performance.

## 2.0 Environmental Restoration

### Critical Outcome Description

*BNL Will Deliver “Best-In-Class” Solutions In Conducting The Environmental Restoration Program. Focused Upon Completion, The Results Will Be Protective Of The Environment, Cost Effective, And Performed In An Open Exchange With The Community, Our Regulators, And Other Stakeholders. BNL Will Continue To Keep The Commitments Agreed To In The Memorandum Of Understanding Signed By Dr. Marburger And Mr Holland On May 4, 2001.*

*The weight of this Outcome is 8% of total.*



### Results

Score (0~4.0)	Rating	Schedule Status
3.6	Outstanding	n/a

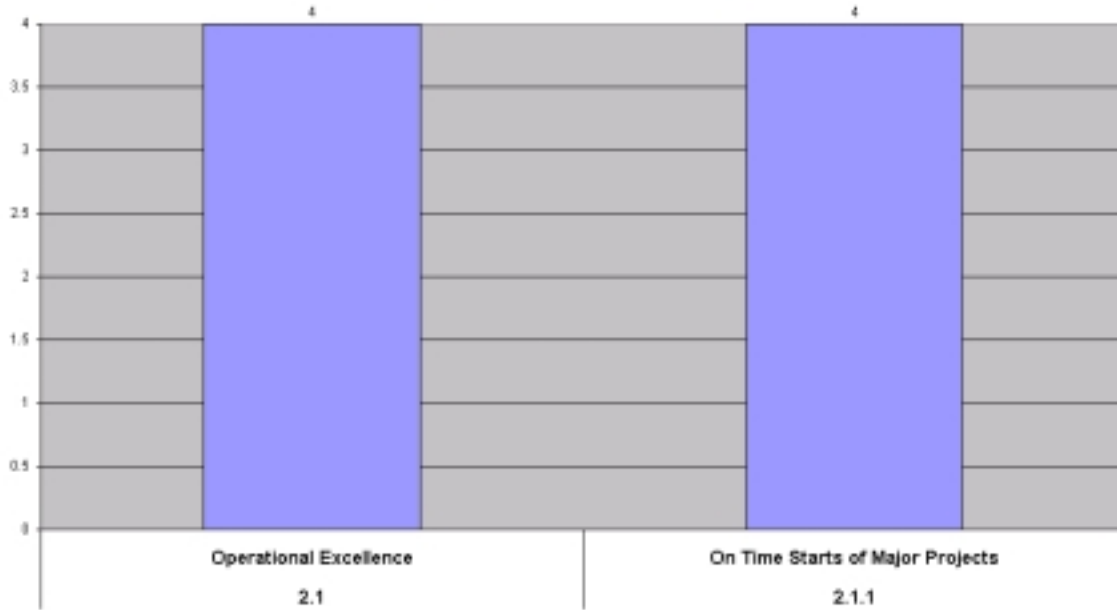
## 2.1 Operational Excellence in Environmental Restoration

### Objective Description

*The weight of this Objective is 60%.*

*BSA will incorporate operational excellence into work planning, authorization and implementation. Hazards are identified and mitigations developed during work planning. Work authorization includes levels of coordination and management review appropriate to risks and impacts. Incidents are reported promptly and timely actions are taken to resolve the problem and prevent recurrence. Trends*

are analyzed and feedback provided to improve performance. Management systems in use are effective tools in minimizing or avoiding events that could compromise safety or impact project costs and schedule.



## Results

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	n/a

### 2.1.1 On Time Starts of Major Projects

#### Accomplishments – Summary

Year to date performance for *On Time Starts of Major Projects* is summarized below:

- Bldg 811 cleanup postponed to FY 04 due to funding; Baseline Change Control Procedure (BCP) authorizing schedule change has been approved.
- Bldg 650 major project start commenced on time.
- Construct Permanent Sediment trap: commenced on time.
- Middle Road Remediation System Startup: completed on time.
- Construction of Western South Boundary System: major project start commenced on time.
- Underground Cooler Removal: major project start commenced on time.

## Results

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	n/a

## Notes

The Brookhaven Graphite Research Reactor (BGRR) major project starts will be reconciled via the Baseline Change Control Procedure (BCP) which will institutionalize BSA's path forward recommendation(s). The BCP was drafted, presented to the DOE and formally submitted April 15, 2002.

## Issues and Trends

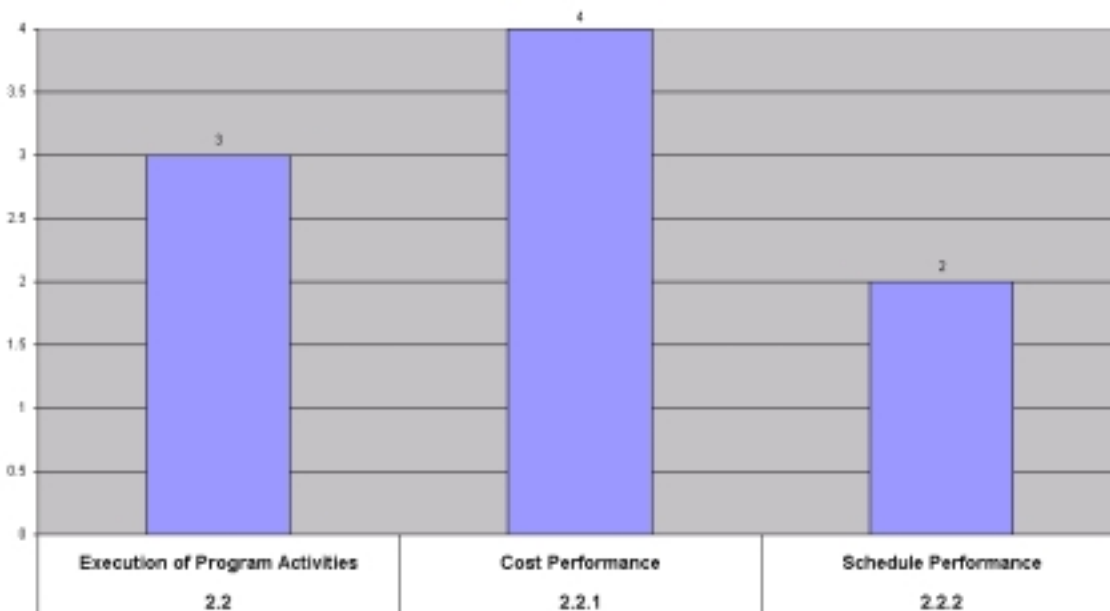
Initiating Remediation of STP Beds and Berms will need to be rescheduled due to FY02 funding constraint. BCP will be submitted to DOE during late April/early May to effectuate this change.

## 2.2 Execution of Program Activities

### Critical Outcome Description

*BNL Will Deliver "Best-In-Class" Solutions In Conducting The Environmental Restoration Program. Focused Upon Completion, The Results Will Be Protective Of The Environment, Cost Effective, And Performed In An Open Exchange With The Community, Our Regulators, And Other Stakeholders. BNL Will Continue To Keep The Commitments Agreed To In The Memorandum Of Understanding Signed By Dr. Marburger And Mr Holland On May 4, 2001.*

*The weight of this Outcome is 8% of total.*



### Results

Score (0~4.0)	Rating	Schedule Status
3	Excellent	Not Applicable

### 2.2.1 Cost Performance

### Accomplishments - Summary

The Cost Performance Index (CPI) was 1.189 through the end of February. Reported CPI excludes BGRR performance as mandated by the performance measure.

#### Results

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	n/a

Cost Performance Index	Amount
Budgeted Cost of Work Performed	9335.8
Actual Cost of Work Performed	7850.6

### Issues and Trends

The Boneyard work (Allied Technology Group bankruptcy issue) may impact the CPI later in FY02; A project team is working on a plan that will require DOE concurrence. Discussions are underway.

## 2.2.2 Schedule Performance

### Accomplishments - Summary

All milestones for the first half of FY02 have been met. At the present time, no acceleration milestones have been pulled into FY02.

#### Results

Score (0~4.0)	Rating	Schedule Status
2	Good	n/a

### Notes

Corrective Actions:

The primary plan is to execute a BCP to reschedule the BGRR milestone that is in informal dispute. BSA has verbally apprised BAO as to the justification for the schedule change; there was no disagreement. As a backup, BSA will also accelerate the following milestones in the event that final dispute can not be reached.

- 1) Submit HWMF Soil Draft RA Work Plan to EPA/DEC
- 2) Submit Magothy Summary Report to BNL/DOE
- 3) Submit Airport System RA Work Plan to EPA/DEC
- 4) Submit LIPA System RA Work Plan to EPA/DEC
- 5) Submit OU VI Remediation System RA WP to EPA/DEC
- 6) Submit Ash Pit RD/RA Work Plan to EPA/DEC
- 7) Submit Meadow Marsh Work Plans to EPA/DEC

We have recently completed EACs (Estimate at Completion) for the balance of FY02 to refine the work plan for the second half of the year. Sufficient flexibility exists and we are making

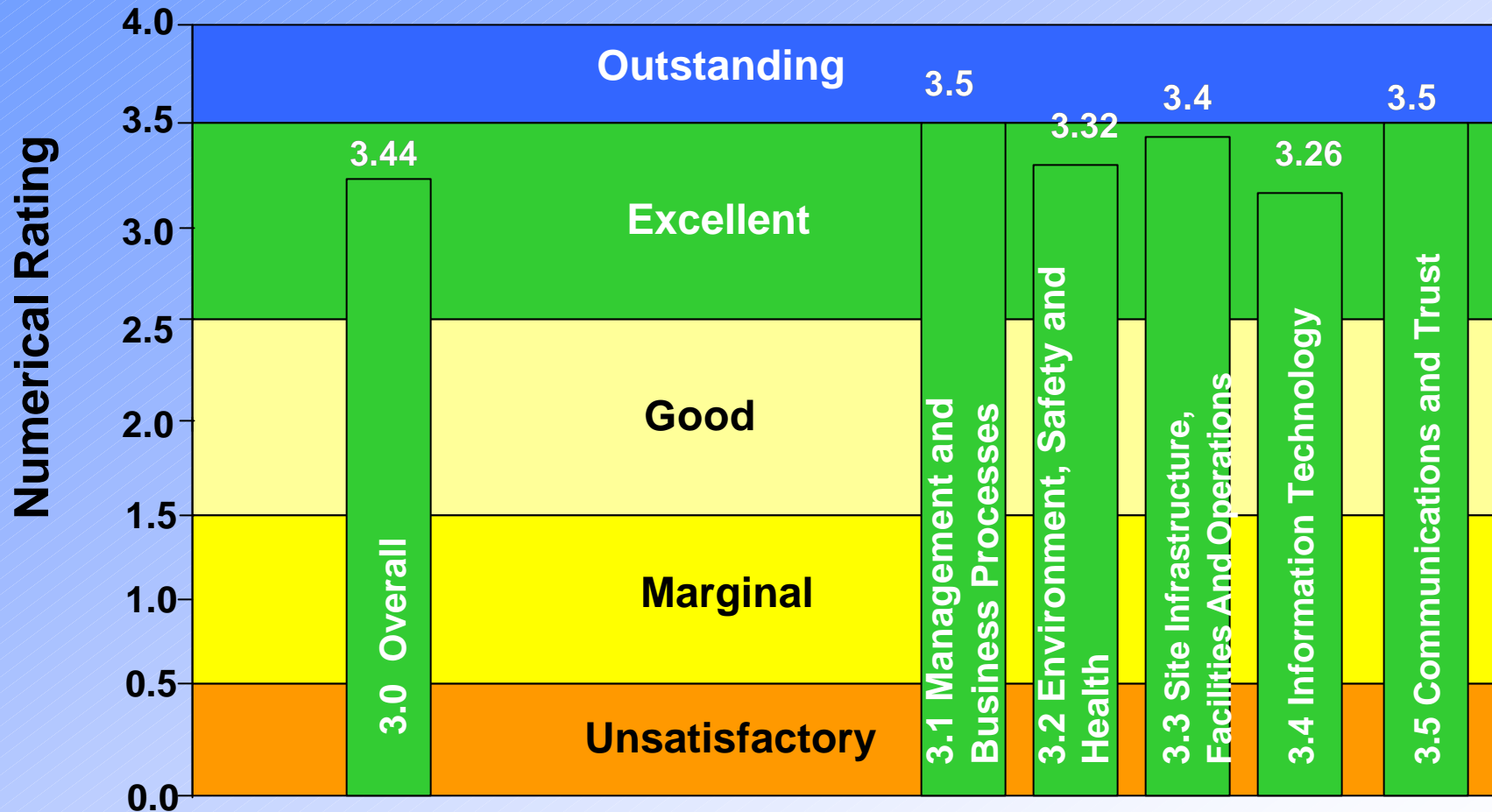
active plans to pull in acceleration milestones necessary to achieve an *Outstanding* rating by the fiscal year's end.

### **Issues and Trends**

There may be an issue with the DOE regarding the BGRR canal completion milestone. An IAG (Interagency Agreement) schedule extension request was submitted and approved. The revised April 15 completion report milestone was recently satisfied. DOE may assert that their contractual approval of the schedule change for performance assessment purposes is independent of the IAG schedule change request. We will work through this communication issue prior to the next data call.



# Critical Outcome 3: Management and Operations



FY02 Mid-Year

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

3.1

**Management and Business Processes**

55% of C.O. #2

3.2

**Environment, Safety and Health**

15% of C.O. #2

3.3

**Site Infrastructure, Facilities and Operations**

10% of C.O. #2

3.4

**Information Technology**

10% of C.O. #2

3.5

**Communications and Trust**

10% of C.O. #2

### 3.1.1 Assessment and Improvement (70% of 3.1)

#### 3.1.1.1 Overall Evaluation of the Laboratory Self-Assessment Program

BSA will coordinate and conduct an overall evaluation of the Laboratory's Assessment Program. The evaluation team will include DOE representatives (BAO and others selected by BAO), BSA Representatives and "peer reviewers" from other Laboratories.

#### 3.1.1.2 Enhance Evaluation of Management Systems

A Management System Evaluation consists of the following:

- Establishment of an evaluation team.
- Development of an Information Package about the performance and operation of the management system
- Conducting an Evaluation Workshop to score the maturity of the MS.
- Generation of a report documenting the evaluation process and results.

### 3.1.2 Business Processes (25% of 3.1)

#### 3.1.2.1 Baseline Study of Laboratory Business Systems

This measure is focused on an effort to baseline/benchmark management processes and systems to identify the set of indicators that collectively can be used to evaluate the ongoing effectiveness and efficiency of the Laboratory business related management systems.

#### 3.1.2.2 Work-for-Others Business Systems

These measures are focused on improving the billing system and the development of a database that will be shared between the DOE/BAO and the Laboratory in accordance with the Office of Science's 2001 Report and in accordance with BNL's FY 2001 Self-Evaluation of WFO-Federal.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

3.1

Management and Business Processes

55% of C.O. #2

3.2

Environment, Safety and Health

15% of C.O. #2

3.3

Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### 3.1.3 Workforce/Diversity (2% of 3.1)

This measure serves to ensure the Workforce Diversity initiatives are effective in ensuring the availability of viable diversity candidates in the pool of individuals applying for managerial and professional positions.

### 3.1.4 Corporate Involvement (3% of 3.1)

Brookhaven Science Associates believes that active corporate involvement is a critical success factor in the management of BNL. To implement this, BSA is committed to the following types of activities at BNL:

- Providing highly skilled candidates for senior management positions at the Laboratory.
- Providing proven management systems and processes for enhancing business operations.
- Facilitating the implementation of these with long-term assignments of key leaders and short-term assignments of subject matter experts.
- Conducting management assessments in various areas of Laboratory operations.
- Providing strategic guidance to the science, technology and cleanup missions of the Laboratory.
- Facilitating the exchange of ideas and practices between other organizations affiliated with BSA corporate partners that bring benefits to DOE and/or BNL.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

3.1

Management and Business Processes

55% of C.O. #2

3.2

Environment, Safety and Health

15% of C.O. #2

3.3

Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### **3.2.1 Legacy ES&H Risk Management (30% of 3.2)**

#### **3.2.1.1 Site Hazard Footprint Management**

This measure is intended to begin establishing a "hazard footprint" for conditions that are not directly related to achieving the Laboratory mission and have not been transitioned to EM for disposition/ resolution. The focus will be on establishing the footprint for radiological hazards.

#### **3.2.1.2 Chemical Disposition Upon Employee Termination**

This measure is focused on evaluating the adequacy and effectiveness of termination processes which contain checks to ensure transfer of responsibilities for the management of chemicals when employees are terminated.

### **3.2.2 On-going ES&H Risk Management (70% of 3.2)**

#### **3.2.2.1 Pollution Prevention**

Each organizational unit must demonstrate active involvement in the BNL Pollution Prevention Program. "Demonstrating involvement" is evidenced by submitting at least two pollution prevention project proposals to the P2 Council and/or two success stories and/or lessons learned stories.

#### **3.2.2.2 Transportation Safety Implementation**

The purpose of this measure is to satisfactorily complete key milestones associated with field deployment/implementation which are scheduled for FY02, and prepare the Laboratory for a DOE independent assessment of the Transportation Safety Program required by DOE Order 460.2.

#### **3.2.2.3 OSHA Reportable Injury Management**

BNL will seek to improve the following reportable rates: Total Recordable Case Rate (OSHA Recordables) TRCR, Lost Workday Case Rate (LWCR) and Lost Work Day Rate (LWDR)

#### **3.2.2.4 Chemical Safety Performance**

This measure is intended to evaluate the effectiveness of those processes and tools in managing chemical risks

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

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Environment, Safety and Health

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Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### 3.3.1 Pursue Alternative Financing for Infrastructure Projects (30% of 3.3)

BSA will continue to evaluate whether "third-party" (non-DOE) project funding is available, feasible and should be used to meet selected infrastructure needs.

### 3.3.2 Project Management (70% of 3.3)

BSA will manage its construction and construction-like projects to ensure scope, schedule and cost objectives are readily met.

This performance measure is for all capital-funded construction projects, excluding Strategic Systems (formerly Major Projects and Major Systems Acquisitions) and EM Projects. It is measured as a composite that accounts for the percent of capital funds committed and costed per fiscal year, the percent of projects on schedule, and the number of capital construction projects with scope completed within the Total Estimated Cost (TEC). The formula for calculating the performance is:

PROJECT RATING (PM):  $(PM) = 0.2 (a^1 + a^2) + 0.2 (b^1 + b^2) + 0.2 (c)$

**3.3.2.1 Funds Committed(a1)**

**3.3.2.2 Funds Costed (a2)**

**3.3.2.3 Project Schedule Compliance (GPP and IHEM) b1**

**3.3.2.4 Project Schedule Compliance (Line Item) b2**

**3.3.2.5 Scope Completed Within Approved Baseline (Line Item, GPP and IHEM) (c)**

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

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32% of BNL Score

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Management and Business Processes

55% of C.O. #2

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Environment, Safety and Health

15% of C.O. #2

3.3

Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

### 3.4.1 Cyber Security (55% of 3.4)

BNL will maintain/improve a Cyber Security program that is designed to protect the unclassified portion of the computing and networking infrastructure from attacks originating from inside or outside the Laboratory, based on: social engineering, physical destruction of network components, or electronic attacks utilizing the network and the Internet. The program must balance the need for openness and the science mission against the security required to reduce the threats to acceptable levels. Two elements of this measure are:

- Completion of the Laboratory's computer security program according to DOE guidelines and directives, and as documented in BNL's Cyber Security Program Plan (CSPP).
- Establishing mechanisms to test, review and evaluate the CSPP to ensure it's value as a "living document;" as such, it will continue to meet the rapidly evolving cyber security risks, with response to external/internal threats balanced appropriately against the needs of the Laboratory science mission.

### 3.4.2 Scientific Computing Infrastructure (45% of 3.3)

BNL will continue to develop and maintain a scientific computing infrastructure that is fully supportive of the Laboratory's scientific mission, focusing on those areas where leveraging existing expertise and local/regional collaborations can produce significant improvement over the current status. This includes:

- Strengthening and upgrading the existing Visualization Program to address the visualization and data analysis requirements for the major BNL scientific initiatives—in particular, for RHIC and ATLAS.
- Strengthening and upgrading the scientific computing resources present in the BNL Computing Facility (BCF), to provide strategic value to the major scientific programs at the Laboratory, as well as to local/regional collaborations.
- Inaugurating a program of New Technology Implementation Assessments (NTIAs). Within this program, a specific new information technology will be investigated for a given Laboratory program/application, by mutual agreement with program/application owner.

# 3.0 Laboratory Management and Operations

## Critical Outcome

## Objectives

## Performance Measures

3.0

BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.

32% of BNL Score

3.1

Management and Business Processes

55% of C.O. #2

3.2

Environment, Safety and Health

15% of C.O. #2

3.3

Site Infrastructure, Facilities and Operations

10% of C.O. #2

3.4

Information Technology

10% of C.O. #2

3.5

Communications and Trust

10% of C.O. #2

The Laboratory will enhance the foundation of trust and confidence it has built by: strengthening existing relationships and building new relationships with key stakeholders, elected and appointed officials, civic leaders, and other important constituencies; effectively communicating the Laboratory's scientific initiatives and accomplishments; generating community enthusiasm for Laboratory research programs; and working to fulfill the education mission shared with DOE.

**3.5.1 Building Regional and National Recognition (50% of 3.5)**  
The objective of this measure is to increase regional and national recognition of the Laboratory and the Department of Energy. Strategic issues include enhancing the effectiveness of Laboratory communications with internal and external publics, showcasing the results of Lab research with special emphasis on RHIC and other high profile initiatives that produce exciting and scientifically interesting new information, building relationships with the press, and developing and improving the Laboratory's use of electronic media.

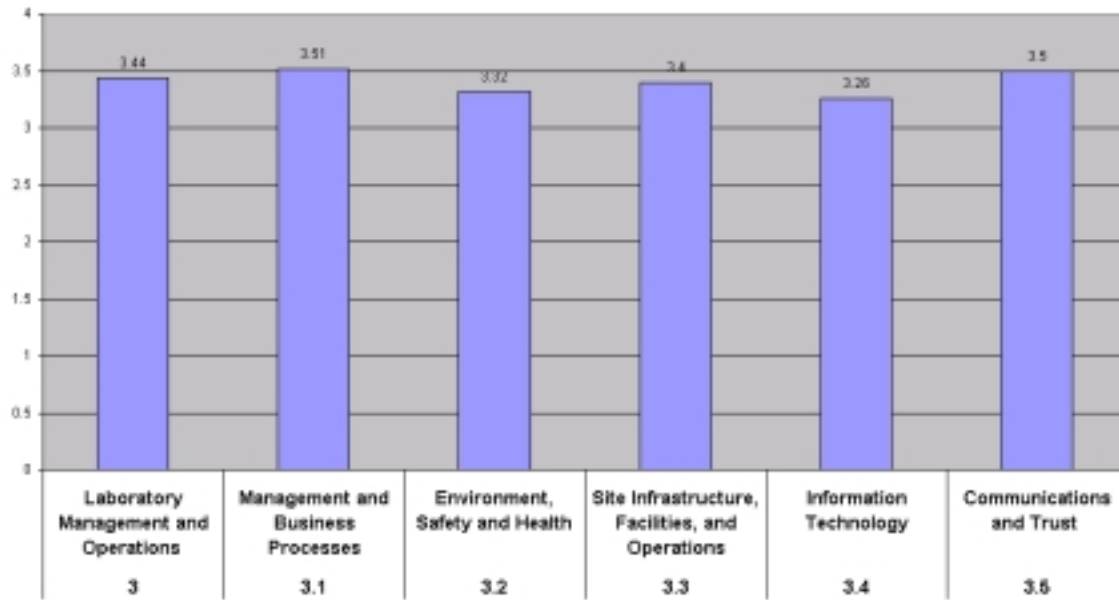
**3.5.2 Stakeholder Involvement and Understanding (50% of 3.3)**  
The Laboratory is committed to ensuring that internal and external stakeholders have access to information about issues of interest and concern, and to providing two-way channels of communication so that stakeholders feel there is a frank and open dialogue with Laboratory management on issues of importance. Responsibility for stakeholder involvement on specific projects rests primarily with the project line manager with strong support from the Laboratory in terms of issues identification, community involvement training programs, information materials development, communications activities such as meetings and roundtables, collection and evaluation of community input, and feedback to the community.

### 3.0 Laboratory Management and Operations

#### Critical Outcome Description

*BNL Will Manage And Enhance Operations And Management Processes To Provide An Effective And Efficient Work Environment That Enables The Execution Of The BNL Mission In A Manner Responsive To Customer And Stakeholder Expectations.*

*The weight of this Outcome is 32% of total.*



#### Results

Score (0~4.0)	Rating	Schedule Status
3.44	Excellent	n/a

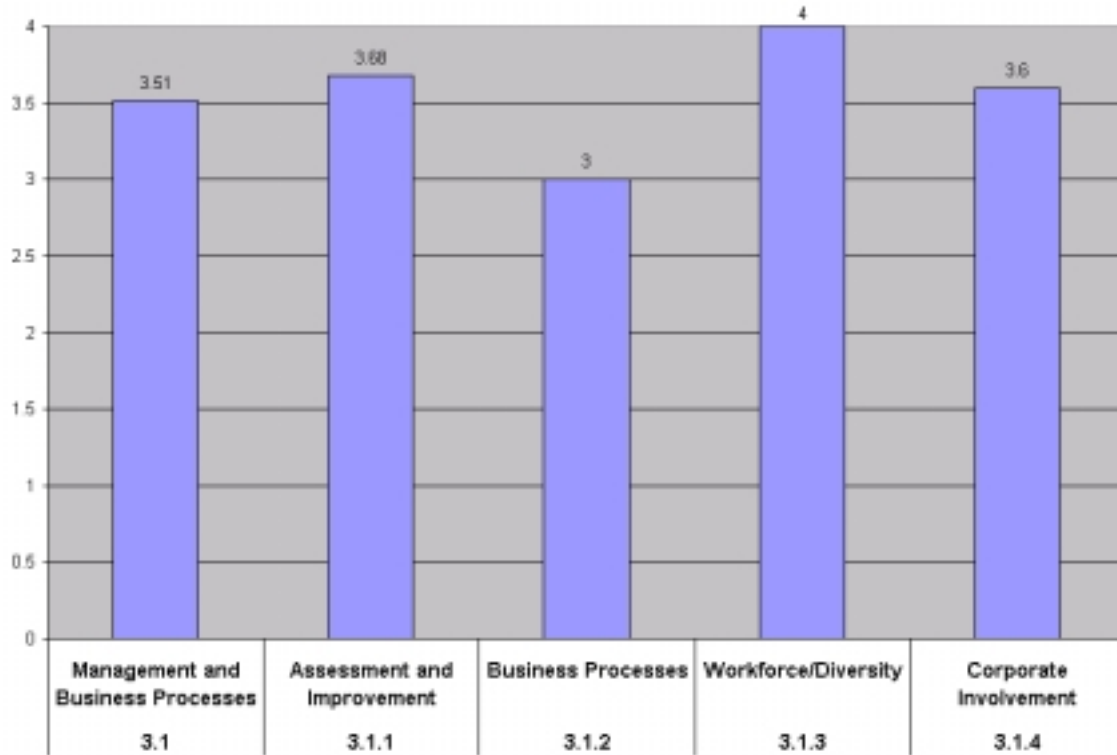
### 3.1 Management and Business Processes

#### Objective Description

*The weight of this Objective is 55% of total.*

*BSA will develop, implement, evaluate, and improve management tools and processes to attract, hire and retain a highly qualified and diverse workforce and enable the workforce to effectively and efficiently support the Laboratory scientific and cleanup missions.*





### Results

Score (0~4.0)	Rating	Schedule Status
3.51	Excellent	n/a

### 3.1.1 Assessment and Improvement

#### Results

Score (0~4.0)	Rating	Schedule Status
3.68	Outstanding	On Schedule

#### 3.1.1.1 Overall Evaluation of the Lab's Self-Assessment Program

##### Accomplishments - Summary

DOE/BAO and BSA have jointly agreed to use the contractually required Supporting Assessment Measure (SAM) as the primary information source for the overall evaluation of the Laboratory's Self-Assessment program. The objective of the evaluation process is to assess the maturity of the Laboratory's Integrated Assessment Program in terms of Approach, Deployment and Results. This information is being captured in 29 Supporting Assessment Measure Plans that have been written and will be approved by both the BNL and BAO SAM owners. The SAMs

themselves are discrete assessments of processes or activities and involve collecting and monitoring data periodically throughout the year.

An assessment program evaluation document/guide was jointly developed and approved by BNL and BAO to provide guidance in developing and evaluating the three elements of a SAM; approach, deployment and results. This document also contains scoring criteria for evaluating each element. A core team of four BAO and four BNL senior managers provide oversight, direction and evaluation for this process. As mentioned previously BAO and BNL SAM owners have been identified as well as their responsibilities. The eight core team members recognize and stress that the process is new and is maturing as it is being implemented.

For this mid-year evaluation the focus was to evaluate the process at the global level. Highlights have been:

- the development of 29 plans;
- counterparts (BAO & BNL) are communicating, interacting and are more engaged; and
- a greater understanding of the level of involvement in the self-assessment process on behalf of the laboratory's management.

There are some plans that need to be developed further but overall approximately 90% of the material is captured. There are no major problems that cannot not be resolved.

The core team has thus determined that an Outstanding rating is appropriate at this time with a score of 3.75.

**Results**

Score (0~4.0)	Rating	Schedule Status
3.75	Outstanding	On Schedule

**3.1.1.2 Enhance Evaluation of Management Systems**

**Accomplishments - Summary**

Management System Evaluations have been performed on all five of the MS (Management Systems);

- Integrated Assessment (IAP)
- Training & Qualification (T&Q)
- R2A2 Process (R2A2)
- Records Management
- Quality Management

Reports have been issued for IAP, T&Q and R2A2. The reports on Records Management and Quality Management are in draft and will be issued in the next few weeks. The initial draft of the Summary Report of the QAP Verification is currently under review.

## Results

Score (0-4.0)	Rating	Schedule Status
3	Excellent	On Schedule

## Notes

The plan is to have the Summary Report on the Quality Assurance Program (QAP) Verification submitted to DOE BAO by May 15, 2002.

### 3.1.2 Business Processes

#### Accomplishments - Summary

This is a rollup of two sub measures, 3.1.2.1 Baseline study of Laboratory Business Systems and 3.1.2.2 Work-for-Others (WFO) Business Systems.

Significant progress has been made for the second measure, WFO Business Systems. The BNL and DOE POCs have met and are in agreement with the WFO Database development outline and the WFO Billing process efforts. Progress on both items has taken place as detailed in each measure.

Measure 3.1.2.1 Baseline Study has made some progress, in that the BSA and BAO counterparts have met and BSA has suggested indicators for the study. However, there is disagreement on details of the approach related to the methodology for determining which indicators should be selected. A follow up meeting has been scheduled to resolve this issue.

## Results

Score (0-4.0)	Rating	Schedule Status
3	Excellent	On Schedule

### 3.1.2.1 Baseline Study of Laboratory Business Systems

#### Accomplishments - Summary

At our first quarterly Self Assessment meeting with DOE on February 4, 2002, BSA presented the following schedule for this measure:

- Jan/Feb - Identify study group - BNL and DOE/BAO team
- Jan/Feb - Identify Management Systems
- Jan/Feb - Compile measures from other labs
- Mar/July - Establish indicators
- Aug/Sept - Specific indicators identified for FY '03

At this point, we believe we are on track to achieve at least an "Excellent" rating for this measure. The key status indicators are:

- The progress made so far and the forecasted effort remaining on the schedule;
- A listing of the indicators and the cognizant Management Systems that can be benchmarked and the basis for that determination; and
- The indicators and Management Systems that cannot be benchmarked and the basis for that determination.

The expectations for this measure require additional discussion and mutual development between BAO and BSA. The measure calls for the identification of key measures and indicators to monitor and evaluate performance, focused primarily on Management Systems. There are two applicable uses of these indicators: Compare them by bench-marking against industry, DOE Labs or other organizations; or, alternatively, use them as internal trend indicators. There is disagreement with DOE/BAO on how to determine the applicable indicators. Based on the 2/4/02 discussion, BAO believes the preferred approach is to:

- (a) Survey industry and other Laboratories to determine what managements systems can be bench-marked (that is, determine where there is sufficient comparative definition and data);
- (b) Apply that information to determine which BSA indicators to select.

Finance and Accounting (F&A) believes that a more time and labor effective approach is to select those indicators that we find are important in the evaluation the effectiveness and efficiency of our business systems, and then to examine how those indicators might be bench-marked for comparative purposes. If particular indicator(s) cannot be bench-marked, then they will be used for internal trending.

F&A's initial step was to request our Divisions/Offices to look at their operations and propose what indicators and management systems they believe would be appropriate for their operations, including examining what comparative information might exist, what others are doing and to contact their counterparts at other Labs. Concurrent with this process, we established an ALDFA team to review the input received, consisting of Mary White, Mark Israel, Kevin Fox and Greg Ogeka. An initial compilation has been made for both indicators and management systems and these are being validated against what is being done by other Laboratories.

The first face-to-face status meeting with DOE/BAO was held on 3/25/02. BSA briefed the progress that was made in identifying the Management Systems that can be benchmarked. BSA prepared a chart that linked the SBMS Business Management Systems with the business systems listed in Article 51 and 62 of the Prime Contract. In addition we included proposed indicators for these business systems. The approach disagreement described above was the subject of a lengthy discussion that requires additional dialog. F&A and BAO agreed to review the business systems again and consider outside sources for determining systems for benchmarks. A follow up meeting has been scheduled.

A second source of information at the Hackett Group (a bench-marking firm) is being pursued to provide some indication as to the applicability of industry bench-marks that are applicable to a DOE laboratory research environment. This may lead to a hybrid approach, as discussed above.

**Results**

Score (0-4.0)	Rating	Schedule Status
3	Excellent	On Schedule

**3.1.2.2 Work for Others (WFO) Business Systems**

**Accomplishments - Summary**

This is a rollup of two sub measures, 3.1.2.2.1 Improving WFO Billing System and 3.1.2.2.2 Develop WFO Database. Both of these measures have made excellent progress toward a

successful completion. Both BNL owners have met with their DOE counterparts and clarified the requirements of the measures. In the WFO Billing System, the Fiscal Division has satisfied all of the DOE/Chicago requirements regarding system requirements and submission of data. In addition, they are working closely with the DOE-BAO to satisfy their need for data in order to reconcile the WFO Billing. The Budget Office has met with their DOE POC and verified the database structure and data fields necessary for the database and is proceeding with developing the database.

**Results**

Score (0~4.0)	Rating	Schedule Status
3	Excellent	On Schedule

**3.1.2.2.1 Improve WFO Billing System**

**Accomplishments - Summary**

This Measure (*to restructure the Work For Others/Other Federal Agencies billing and collection process and the related Financial Information System reporting restructure*) is on schedule.

Under the Fiscal Services Division’s management, the DOE/Chicago conversion timeline requirements were met ahead of schedule, and billing data is currently being transmitted electronically to the DOE’s IPAC system. DOE/Chicago is completely satisfied, and hard copy invoices are no longer required to be sent to them. We are partnering with the DOE/BAO office to re-engineer their internal process that presently manually posts hard copy invoice data into Excel spreadsheets for their tracking of WFO documents. Several group and one-on-one meetings have taken place with DOE/BAO. These ongoing meetings will be used to determine the best approach to reduce BAO’s labor-intensive effort, until the Budget Office’s WFO Database (refer to Performance Measure 3.1.2.2.2) is available to accept the electronic feed from Fiscal’s billing system.

**Results**

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	On Schedule

**3.1.2.2.2 Develop WFO Database**

**Accomplishments - Summary**

The Budget Office is currently partnering with DOE/BAO to re-engineer the Work for Others (WFO) program at BNL. The key element is a WFO database management system for maintaining and reporting on life cycle Other Federal Agency (OFA) and Non Federal Agency (NFA) projects. This system will maintain the Proposal Information Questionnaire (PIQ) and related financial data including funding, costs, and billing history. Three face-to-face meetings have taken place with DOE/BAO to layout expectations and requirements. As a result, the scope of the project has been defined, the database elements and structure designed, and database software has been ordered. The Budget Office expects to have the preliminary database framework completed by the end of April.

**Results**

Score (0~4.0)	Rating	Schedule Status
3	Excellent	On Schedule

### 3.1.3 Workforce/Diversity

#### Accomplishments - Summary

From October 1, 2001 to present, there were a total of 64 requisitions filled in the Officials & Managers and Professional EEO categories. Of those 64, 44 or 68.7% had at least one diversity candidate, i.e. female or minority. This represents a raw increase of 7.6% or a relative increase of 12.4% over the 61.1% average for the two base reference years of 1998 and 1999 for this measure. An improvement of 10% or more correlates to a performance level of *Outstanding*.

#### Results

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	On Schedule

### 3.1.4 Corporate Involvement

#### Accomplishments - Summary

Overall performance for corporate involvement is rated as *Outstanding* with a score of 3.6. Based on Laboratory need, performance for all elements is considered acceptable and therefore an “*Outstanding*” rating is warranted. Highlights of performance for each category are discussed below.

- **Providing highly skilled candidates for senior management positions at the Laboratory.**

With the exception of the Laboratory Director no new senior management positions have been identified. In 2001, the Laboratory Director and the HR Director participated in a Battelle-sponsored meeting at which time, BCO, ORNL, PNNL and BNL shared information regarding succession plans for certain key positions. Discussions took place regarding the benefit to all organizations of moving employees between facilities. There will be a similar conference this year and BNL again plans to participate.

- **Providing proven management systems and processes for enhancing business operations.**

Most key management systems have been brought to the Laboratory in previous years. The focus has been on continued deployment and improving those systems. Both PNNL and BNL have deployed management system “maturity” assessment methodologies which provide a systematic process for evaluating how well a management process is defined and implemented. PNNL has piloted an approach to present an overall status (maturity) of the collective set of management systems. BNL is evaluating the PNNL methodology for potential use.

- **Facilitating the implementation of these with long-term assignments of key leaders and short-term assignments of subject matter experts.**

In the first half of FY02 there has been no additional need for long or short term appointments of key leaders or subject matter experts.

- **Conducting management assessments in various areas of Laboratory operations.**

The third Brookhaven Science Associates (BSA) Corporate Oversight Review was conducted from October 29-November 2, 2001. The review scope involved four areas that were determined by BSA senior management to be of importance to Brookhaven National Laboratory (BNL) operations, including Leadership Changes, Management Systems Feedback and Improvement, Organizational and Institutional Self-Assessments, and Price-Anderson Amendments Act (PAAA) and Quality Program effectiveness. This last area was augmented by a review conducted in September and early October (2001) of the Laboratory's response to DOE Headquarters Office of Enforcement (EH-10) findings on the PAAA Program.

Battelle provided a Radiation Protection Manager to do one of the Triennial Assessment functional element reviews in the first quarter of FY02. Oak Ridge National Laboratory is providing support on the deer radiological screening program.

- **Providing strategic guidance to the science, technology and cleanup missions of the Laboratory.**

On March 8 and 9, the BSA Science and Technology Steering Committee met at Brookhaven National Laboratory. This Committee provides science advice and guidance to Laboratory management and reports to the BSA Board of Directors. The members of the Committee represent the corporate partners (SUNY Stony Brook and Battelle Memorial Institute) as well as the Core Universities (Columbia, Cornell, Harvard, MIT, Princeton, and Yale). Specific topics discussed included plans in High Energy Physics, upgrades in the Life Sciences imaging program, the proposed NSLS upgrade, and upcoming external reviews of Energy Science & Technology and Environmental Sciences and Physics/CAD/CAP. The Committee members also attended a portion of the Workshop for the BNL Center for Functional Nanomaterials at which Congressmen Felix Grucci and Sherwood Boehlert spoke about the Physical Sciences in the 22<sup>nd</sup> Century. The Committee provided Laboratory management with advice on developing a strategic planning model for High Energy Physics, supporting the 7 Tesla magnet upgrade for the imaging program, and providing insight on timing the upgrade of the NSLS to PERL to fit in with the DOE mission. External review panels are in the process of being formulated to conduct reviews in Energy Science & Technology and Environmental Sciences and in Physics/CAD/CAP during the 2002 fiscal year.

- **Facilitating the exchange of ideas and practices between other organizations affiliated with BSA corporate partners that bring benefits to DOE and/or BNL.**

November 5 and 6, 2001 a Battelle ESH&Q integration meeting was held at Oak Ridge National Laboratory. The meeting focused on 4 themes; Standards Based Management Systems; Performance Based Management/Integrated Assessment, Integrated Safety Management, and Environmental Management Systems/Pollution Prevention. Actions in each of these themes were identified and viewed to be beneficial for all/most of the Laboratory's involved in the integration initiative. A follow-up meeting to review the status of actions is scheduled for June.

Battelle Corporate personnel and ORNL/PNNL personnel are providing assistance to BNL for defining the scope and conditions in the next BNL contract and also on BNL's input to DOE-SC evaluation of external regulation.

**Results**

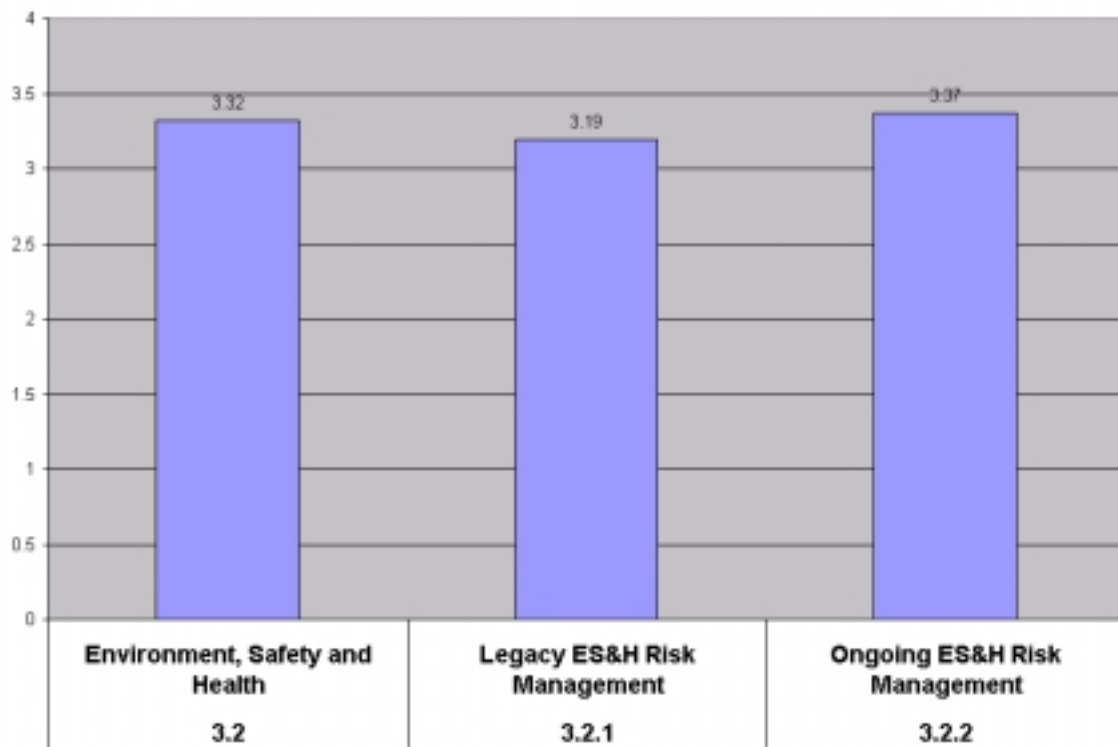
Score (0~4.0)	Rating	Schedule Status
3.6	Outstanding	n/a

**3.2 Environment, Safety and Health**

**Objective Description**

*BNL will develop, implement, and continuously improve management systems, processes, and services to effectively and efficiently manage environment, safety, and health risks associated with the legacy vulnerabilities and work associated with support of ongoing Laboratory mission activities.*

*The weight of this Objective is 15%.*



**Results**

Score (0~4.0)	Rating	Schedule Status
3.32	Excellent	On Schedule



### 3.2.1 Legacy ES&H Risk Management

#### Results

Score (0~4.0)	Rating	Schedule Status
3.19	Excellent	On Schedule

### 3.2.1.1 Site Hazard Footprint Management

#### Accomplishments - Summary

Progress is ongoing on this measure with one dedicated FTE and periodic support from the technician pool. Progress has been much slower than expected due to 1)late start and 2) significantly more archival material to review than anticipated. Additional resources will be allocated to improve the pace.

#### Results

Score (0~4.0)	Rating	Schedule Status
2.5	Good	Behind Schedule

#### Notes

Corrective Actions:

The Radiological Control Division (RCD) is currently negotiating with BAO to revise the measure i.e., reduce the number of characterized buildings, required to reach an *Excellent* rating. The revision is justified based on level of effort to accomplish the work being significantly more than originally anticipated. BAO is reviewing our request. If they approve it RCD will be able to achieve scores above 2.99 with our available resources. If they do not approve it RCD will not be able to score above 2.99 without additional resources which are beyond our current authorized budget. RCD would estimate an additional 1/2 FTE would be needed to get above a score of 2.99.

### 3.2.1.2 Chemical Disposition Upon Employee Termination

#### Accomplishments - Summary

Metric Status Summary for end of 2<sup>nd</sup> quarter of FY2002

Chemical Management System

FY 2002 Terminated Employees Report, Tuesday, March 19, 2002

Number of Employees Leaving BNL in FY 02: 158

Terminated Employees Who Were Responsible for Chemicals

Terminated Employees with Chemicals in FY 02 as of Tuesday, March 19, 2002: 31

Terminated Employees Who Did Not Reconciled Before Termination Date: 11

Terminated Employees Who Did Reconciled Before Termination Date: 20

Number of Employees Who Failed to Reconcile Within 1 Month of Termination: 1 Employees with 100% Reconciled Chemicals within 1 Month of Termination: 96.8%

#### Results

Score (0~4.0)	Rating	Schedule Status
3.88	Outstanding	n/a

### 3.2.2 On-going ES&H Risk Management

#### Results

Score (0~4.0)	Rating	Schedule Status
3.37	Excellent	On Schedule

### 3.2.2.1 Pollution Prevention

#### Accomplishments - Summary

List of Organizations along with the number of Pollution Prevention Proposals and success stories/lessons learned submitted:

- Basic Energy Sciences Directorate (0 proposals submitted)
- EENS Directorate (2 proposals submitted)
- Environmental Management Directorate (2 proposals submitted)
- Facilities and Operations Directorate (6 proposals submitted)
- Finance and Administration Directorate (3 proposals submitted)
- High Energy & Nuclear Physics Directorate (2 proposals submitted)
- Life Sciences Directorate (6 proposals submitted)

#### Results

Score (0~4.0)	Rating	Schedule Status
3.4	n/a	Ahead of Schedule

#### Issues and Trends

This is almost an *Outstanding* rating for this performance measure, assuming all other organizations have a Pollution Prevention goal in their Environmental Management System (which is standard practice and is being verified).

#### Assumptions

BES (Chemistry, NSLS, and Center for Accelerator Physics) is the only one without a submittal yet. They can meet this goal by reporting on at least 2 success stories or by submitting a couple of proposals.

### 3.2.2.2 Transportation Safety Implementation

#### Accomplishments - Summary

The objective of the Transportation Safety Re-engineering Project (TSRP) was to re-engineer the BNL Transportation Safety Program to bring it into full compliance consistent with all applicable DOE/ Federal/State Regulations, DOE contractual requirements and SBMS system format. As part of the TSRP, the following aspects of the TSP have been developed and have either been implemented or are under continual implementation:

- Established a “Management System” for Hazardous Material Transportation Safety,
- Revised the Transportation Safety Manual and included it in Standards Based Management System (SBMS) as a “Program Description”,
- Developed four Subject Areas;
  - Transportation of Hazardous Materials Offsite;

- Transportation of Radiological Materials Offsite;
- Transfer of Hazardous Materials Onsite;
- Transfer of Radiological Materials Onsite.
- Upgraded Dept/Division specific SOP's to provide detailed implementing information,
- Appointed a Transportation Safety Officer (TSO) to serve as the management system Subject Matter Expert with authority for transportation safety matters.
- Established Transportation Safety Working Group (TSWG) with representation from BAO, WMD, Safeguards & Security, PPM, NSLS and ESH that served as the developer of the SBMS documentation. The TSWG also continues to assist the TSO in implementing and maintaining the TSP portion of the SBMS as it matures and/or requires changes. In addition, BNL Senior Management has approved the charter for the operation of the TSWG.

The Transportation Safety Re-engineering Project Implementation Plan was tracked to completion using the Laboratories institutional Action Tracking System and was completed ahead of schedule.

The TSRP resulted in an implementation plan which identified milestones itemized in 3.2.2.2.1 and 3.2.2.2.2. These milestones were designed to further implement, sustain and improve the re-engineered TSP. This effort will also aid BNL considerably in the satisfactory completion of the DOE-required triennial compliance assessment (this assessment has not been scheduled but will be for FY03 and will include some members "independent" of BNL.

**Results**

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	Ahead of Schedule

Milestone	Milestone date	Actual or Projected date
Develop/implement hazardous Material training for Contractor Vendor Orientation, Gen. Employee Training and Gen. Awareness Training	11/30/01	11/9/01
Complete development of "Hazardous Material Transportation" web site	1/30/02	12/04/01
Identify personnel who need gen. Awareness training, train, modify JTA	3/30/02	3/21/02
Identify, prioritize schedule SAMs throughout depts/divs. To cover current transportation activities	3/30/02	3/20/02

**3.2.2.2.1 Complete the Following Milestones**

**Accomplishments - Summary**

1. Contractor Vendor Orientation was modified to include the necessary hazardous material transportation training. This orientation was modified on 10/25/2001. General Employee Training was modified to include the necessary hazardous material transportation training. This orientation was modified on 5/23/2001.

The General Awareness Training, called “Transportation of Hazardous Material-General Awareness (TQ-HAZMAT)” was developed and posted to the Training and Qualification Web Page on 11/9/01. The course is subdivided into two parts “TQ-Hazmat-A” is for those staff determined to be DOT Hazmat Employees and must take a test and 3 year re-qualification and “TQ-Hazmat-B” is for staff that are not DOT Hazmat Employees and are not required to test or requalify. The training may be accessed at <http://training.bnl.gov>.

2. The “Hazardous Material Transportation” Web Site was developed to communicate hazmat requirements, provide points of contact and resources for hazmat transportation compliance. The web page is available at <http://www.bnl.gov/bnlweb/hazmat.html> and was officially posted in its final form on 12/04/02.

3. All Department/Division Training Coordinators and Transportation Points of Contact were notified on 11/9/2001 that the training was available and again on 1/28/02 of the need to identify personnel who need to take the general awareness training, train them and modify their Job Training Assessments (JTA’s) as appropriate. Subsequent contact by the Transportation Safety Officer with the Training Coordinators and Points of Contact was made during the course of the process to identify and prioritize SAM’s, to assure that required personnel had taken the training and JTA links updated. All the necessary personnel have now been identified and taken the appropriate training (A or B). This training is documented on the T&Q database. A course Attendance Report can be run which shows, by Department, who has taken each course and the date taken, in addition, individual employee reports can be run which show the JTA linkage.

4. An exercise was conducted to identify, prioritize and schedule Safety Assessment Methodologies (SAM’s) needed throughout the departments/divisions to cover current transportation activities. This exercise was both methodical and detailed and included the following steps;

- a. The TSO (and select members of the Transportation Safety Working Group) met with each dept/division POC and selected line personnel to review their transportation activities and make determinations as to what needed to be documented under the SAM process, and to discuss and verify required training.
- b. Several existing resources at the laboratory were used to gather information including the etiologic agent survey, chemical management system dept/division inventory runs, MSDS database and walkdowns of selected areas flagged during the resource review.
- c. A Hazardous Material Transport questionnaire was generated for each dept/division in conjunction with the POC to document types of materials, quantities, frequencies, locations and a determination if the materials fell under a MOT exemption or would need to be SAM’ed or otherwise controlled (i.e. SOP, placards).

All milestones of 3.2.2.2.1 are complete

**Results**

Score (0~4.0)	Rating	Schedule Status
n/a	n/a	Ahead of Schedule

### 3.2.2.2.2 Develop Safety Assessment Methodologies Schedule for FY02

#### Accomplishments – Summary

An exercise was conducted and completed (see 3.2.2.2.1) to identify, prioritize and schedule Safety Assessment Methodologies (SAM’s) needed throughout the departments/divisions to cover current transportation activities. This exercise was both methodical and detailed and included the following steps;

- a. The TSO (and select members of the Transportation Safety Working Group) met with each dept/division POC and selected line personnel to review their transportation activities and make determinations as to what needed to be SAM’ed, and verified training.
- b. Several existing resources at the laboratory were used to gather information including the etiologic agent survey, chemical management system dept/division inventory runs, MSDS data base and walkdowns of selected areas flagged during the resource review.
- c. A Hazardous Material Transport questionnaire was generated for each dept/division in conjunction with the POC to document types of materials, quantities, transport frequencies, locations and a determination if the materials qualified under a MOT exemption or would need to be documented under the SAM process or otherwise controlled (i.e. SOP, placards).

To lower the level of risk for transportation activities, this exercise was beneficial in identifying areas that would improve from operational changes, SBMS subject area modifications or operating procedure changes . It also identified that in some cases a SAM may not be necessary, if for example, the commodity is placarded as per DOT, or specific SOP’s already include SAM requirement. The results from this exercise: 1) identified certain pesticides/herbicides that could be reduced in quantity or eliminated from the inventory; 2) determined that transportation of regulated medical waste would need to be covered in a SAM but will also result in some potential changes to the Regulated Medical Waste subject area to assure that all requirements are in one place; and 3) identified certain SOP’s that exist for source transfers and may be modified to assure that SAM requirements are incorporated and/or appended with SAM information.

The Schedule is as follows:

Hazardous Material	Dept/Division	Status	SAM Completion Date
Oil with flash point > 141 F	Site	Drafted	5/30/02
Compressed gas (flammable)	Site	Drafted	5/30/02
Compressed gas (non flammable)	Site	Drafted	5/30/02
Cryogenic Liquid (flammable)	Site	Drafted	5/30/02
Cryogenic non (flammable)	Site	Drafted	5/30/02

Regulated Medical Waste	BO, CO, NSLS, MO		8/30/02
Botulinum Toxin	Biology	Complete	2/27/01
Pesticides/Herbicides	Biology		7/30/02
Chromyl Fluoride	Chemistry	Complete	10/8/01
Vacinnia	Instrumentation	Complete	2/28/02
Activated Carbon Filters	Environmental Restoration		7/30/02
Blip Targets	Medical	SOP	8/30/02
Seimans Oil (tank)	CAD		6/30/02
AC 500	CAD	Complete	2/5/02
H-3 tankers	CAD		6/30/02
Beam Separator	CAD	Complete	2/20/02
Fuel Delivery Fuel Oil & gas	Plant Engineering	Placarded	6/30/02
Water Treatment Chemicals	Plant Engineering	Riggers delivery	6/30/02
Sodium Hypochloride (Tanker)	Plant Engineering	Placarded	7/30/02
Waste Oil (Tank)	Plant Engineering		7/30/02
#2 Fuel Oil (Tank)	Plant Engineering		7/30/02
Nitrogen Tube Trailers	Plant Engineering		7/30/02
Radium/Berrilium Sources (sigma pile)	Reactor	Complete	9/24/01

### 3.2.2.3 OSHA Reportable Injury Management

#### Accomplishments - Summary

From the CAIRS Table S3, the most recent complete BNL calendar year data (January to December 2001) are as follows:

TRCR = 2.6, LWDR = 24.9, LWCR = 1.2.

The DOE 5-Year Averages (1996 through 2000) for the measures are as follows:

TRCR = 3.2, LWDR = 43.5, LWCR = 1.4.

Based upon the rating criteria that "Good" is equal to +/- 15% of the DOE 5-Year Average, "Excellent" is equal to <15% - 30% the DOE 5-Year Average, and "Outstanding" is equal to <30% the DOE 5-Year Average, BNL Scores are:

- TRCR = 3 for "Excellent",
- LWDR = 4 for "Outstanding", and
- LWCR = 2 for "Good".

The Composite Score is  $(TRCR) 3 \times .33 + (LWDR) 4 \times .33 + (LWCR) 2 \times .33 = 2.97$ .

BNL Composite Rating is "Excellent".

### Results

Score (0~4.0)	Rating	Schedule Status
2.97	Excellent	Ahead of Schedule

Reportable Rate	Rating	Actual or Projected Score
TRCR (Total Recordable Case Rate)=2.6	Excellent	n/a
LWDR (Lost Workday Day Rate)= 24.9	Outstanding	n/a
LWCR Lost Work Case Rate)= 1.2	Good	n/a

### Notes

Corrective Actions:

Performance Measure 3.2.2.3 is complete for FY02 and has an *Excellent* Rating based upon a score of 2.97. However, BNL's performance for FY03, which will be determined using calendar year 2002 data, is slipping. Although Safety and Health Services cannot control the outcome of these matrixes, we are the point of contact and owner of the data. Several initiatives are planned to increase awareness and control by BNL managers and employees regarding our safety statistics. The first initiative is Safety Awareness Day which has been scheduled for July 8, 2002. In addition, other initiatives will be discussed at the upcoming Policy Council Meeting on June 18th.

Analysis of the impact of the new OSHA Reporting requirements indicates that they will have a significant affect on these metrics.

There are three performance measures against which BSA is measured under the current contract:

1. Recordable Case Rate (TRCR)
2. Lost Work Case Rate (LWCR), and
3. Lost Workday Rate (LWDR).

Over the past few years, BSA has achieved significant improvement to these measures. However, the changes agreed to between the Department of Labor, Occupational Safety and Health Administration (OSHA) and the Department of Energy in their Memorandum of Understanding (MOU) will pose a significant burden on BNL and worsen BNL's position. BNL's RATES WILL BE NEGATIVELY IMPACTED. An increase of thirty percent for TRCR and LWDR would not be a surprise

Any positive changes in 29 CFR 1904 are negated by these facts:

1. Expansion of the standard also includes additional requirements and clarifies definitions which will result in an increase in the number of recordable cases, such as the inclusion of all muscular skeletal disorders and non-working parking lot injuries such as falls on ice going to or from work.
2. The Lost Work Cases will increase because of the expansion of types of cases that fall into the work-relationship category.
3. Lost workdays are capped at any combination of days away from work (DAW) and restricted days (RWD) up to 180. The problem is that the count kept is no longer workdays, but calendar days. This will be the most drastic increase.
4. Rates are still determined by actual hours worked.
5. DOE has ordered that all cases occurring up to 12/31/01 be estimated and capped.

If we use the latest three Calendar Year information, here are some examples of what to expect:

CY1999	TRC	LWC	DAW	RWD	NFC
A.	89	50	733	655	39
B.	98	51	1025	935	47

CY2000	TRC	LWC	DAW	RWD	NFC
A.	62	38	598	288	24
B.	88	42	872	461	46

CY2001	TRC	LWC	DAW	RWD	NFC
A.	85	40	985	596	45
B.	111	42	1393	834	69

Key:

- A. Current Records for each Calendar Year (2000 and 2001)
- B. All Work-related cases for each calendar year adjusted by new requirements

It is recommended that BNL negotiates the applicable portions of the FY03 contract differently because the DOE 5-year average capturing CY2002 data will be a mixture of data from the old OSHA reporting criteria and the new OSHA reporting criteria.

### 3.2.2.4 Chemical Safety Performance

#### Accomplishments - Summary

This measure includes 3.2.2.4.1, Chemical Inventories and Accountabilities and 3.2.2.4.2, Peroxide Forming compounds. There was no data collected for this measure during the first two quarters of FY02. All assessments against this measure will be obtained during the last two quarters of the calendar year. SHSD is projecting an “*Excellent*” or “*Outstanding*” rating in this measure due to the following improvements in CMS:

1. Addition of user friendly on-line forms to assist in deletions and transfers.
2. Improvement communication with the PPM staff.



3. Modification of the ERE process to include chemical inventories reconciling activities during changes to work locations.
4. Improved processes to provide feedback to chemical users.
5. Re-enforcement communication for CMS Performance at ESH Coordinators Meetings.
6. The completion and implementation of the “Working with Chemicals” Subject Area.

**Results**

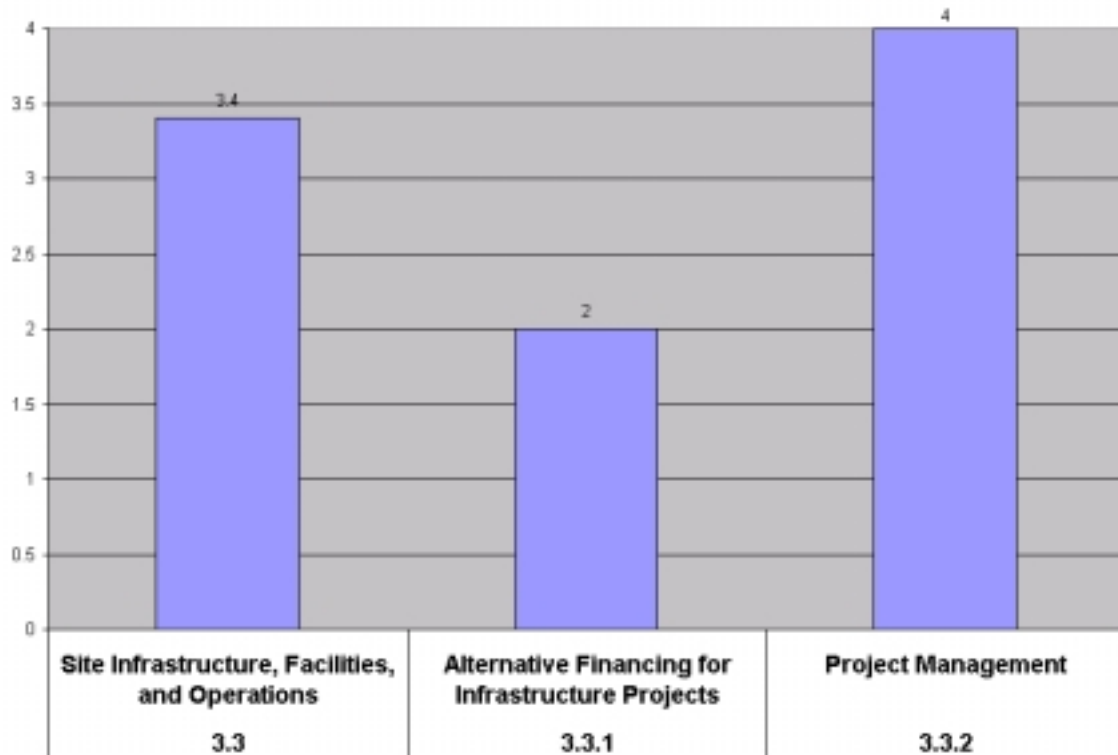
Score (0~4.0)	Rating	Schedule Status
3	Excellent	n/a

### 3.3 Site Infrastructure, Facilities, and Operations

**Objective Description**

*The weight of this Objective is 10%.*

*BNL will maintain and improve the efficiency and reliability of the site infrastructure and manage projects to upgrade site facilities to meet the objectives of the Strategic Facility Plan and Master Site Plan. Site operations will be managed to ensure effective protection of personnel, property, the general public, national security interests, proprietary information, classified matter, and sensitive unclassified information.*



## Results

Score (0~4.0)	Rating	Schedule Status
3.4	Excellent	n/a

### 3.3.1 Pursue Alternative Financing for Infrastructure Projects

#### Accomplishments - Summary

- 12/04/02 - Met with Cliff Rudolph of Frendolph Construction and had formal discussions on third party opportunities. Toured apartment facilities that his organization have developed and are leasing agents.
- 02/15/02 - Met with Bob Coughlan of TRITEC (developer) and Lou Giacalone of Ehazs Giacalone (A/E) to discuss third party opportunities at BNL.
- 03/06/02 - Met with Bob Schimmenti and had discussions on third party opportunities at BNL. Bob Schimmenti represents a New York City real estate developer that is interested in building apartments at BNL.

## Results

Score (0~4.0)	Rating	Schedule Status
2	Good	On Schedule

#### Notes

##### Corrective Actions:

Numerous solicitations, targeted letter-writing and meetings have taken place during May 2002, culminating in a meeting at BNL on 5/31, attended by over 50 individuals, representing 30 organizations, interested in responding in BNL's RFP for Third Party Funding. This activity will result in a score of 4.0, *Outstanding*, for this performance measure.

### 3.3.2 Project Management

#### Accomplishments - Summary

The Project Management summary measure is 94.9% which corresponds to an "*Outstanding*" rating. This is based on the following factors: a1 = 100%, a2= 87%, b1=87.5%, b2 = 100% and c=100%.

## Results

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	On Schedule

#### Issues and Trends

The Project Management measure is on track for an "*Outstanding*" rating.

### 3.3.2.1 Funds Committed a1

#### Accomplishments - Summary

Commitment of funds is ahead of schedule for all line item projects and for the GPP program.

Planned commitments for the end of the second quarter were \$5,152K and actual commitments are \$5,770K.

**Results**

Score (0~4.0)	Rating	Schedule Status
4	Outstanding	Ahead of Schedule

Report Date	a1 Value
2002 Mid-Year	1.0
2002 Year-End	n/a

**Issues and Trends**

It is anticipated that commitments will remain slightly ahead of schedule for the balance of the year.

**Assumptions**

The permit to construct the Rad Storage Building as part of the Groundwater Protection Line Item is received by June 1st.

**3.3.2.2 Funds Costed a2**

**Accomplishments - Summary**

Funds costing is ahead of schedule for the GPP program and on schedule for the Electrical Mods Phase II Line Item and the Groundwater Protection Line Item. Costing appears slightly behind schedule for the Sanitary Phase III Line Item but this is due to delayed invoicing by the contractor. This project is complete and all costing will be reflected in the next quarter's data.

**Results**

Score (0~4.0)	Rating	Schedule Status
3.7	Excellent	On Schedule

Report Date	a2 Value
2002 Mid-Year	.87
2002 Year-end	n/a

**Issues and Trends**

The trend is for actual cost vs. plan to improve as FY2002 moves ahead. We expect to be > 90% or *Outstanding* at the end of FY02.

**3.3.2.3 Project Schedule Compliance (GPP and IHEM) b1**

**Accomplishments - Summary**

As of 3/31/02 only three projects were scheduled for completion. Of these, two were completed on time and one was completed two weeks late. Thus the percent completed on time is 2/3 or 67% which corresponds to a 1.7 score. Since there are eight projects scheduled for completion in

the second half of FY02 and these projects are on schedule, this score is expected to improve to a 3.75 or *Excellent*. As the balance of FY02 progresses, each of these projects will be closely monitored to assure they are finished on-time.

**Results**

Score (0~4.0)		Rating	Schedule Status
3.75		Outstanding	Behind Schedule
Report Date	b1 Value		
2002 Mid-year	.875		
2002 Year-end	n/a		

**Issues and Trends**

There are 11 projects scheduled for completion this year. The remaining 8 that have not been completed thus far are progressing well and are expected to be completed on time which should result in an *Excellent - Outstanding* rating.

**3.3.2.4 Project Schedule Compliance (Line Item) b2**

**Accomplishments - Summary**

All Line Item milestones scheduled for FY02 to date have been completed on time. These include Design Complete and Construction Started for both the Electrical Mods Phase II and Groundwater Protection projects.

**Results**

Score (0~4.0)		Rating	Schedule Status
4		Outstanding	On Schedule
Report Date	b2 Value		
2002 Mid-year	1.0		
2002 Year-end	n/a		

**Issues and Trends**

Both FY01 Line items are proceeding on or ahead of schedule. FY99 Line Item Sanitary Phase III is on schedule for completion in April.

**3.3.2.5 Scope Completed Within Approved Baseline**

**Accomplishments - Summary**

Thus far in FY02, three projects have been completed and each of these projects accomplished all the intended scope.

**Results**

Score (0~4.0)		Rating	Schedule Status
4		Outstanding	On Schedule

Report Date	c Value
2002 Mid-year	1.0
2002 Year-end	n/a

### Issues and Trends

Eight projects remain to be completed during FY02. It is currently anticipated that each of these projects will accomplish the intended scope.

## 3.4 Information Technology

### Objective Description

*BNL will provide a cost effective, reliable, and secure computing/communications infrastructure for administrative computing, and support to scientific programs for unique computing problems.*

*The weight of this Objective is 10% of total.*

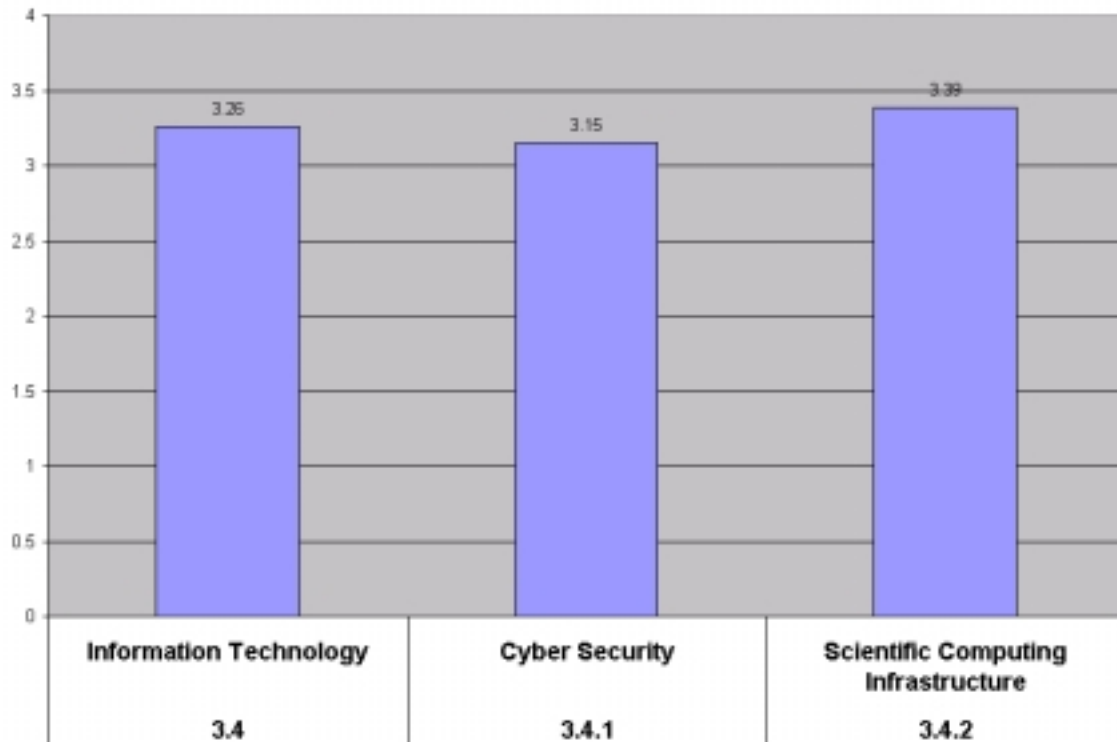
#### *Performance Level Metrics*

*Note: All the measures within this objective are date driven milestones. The following metrics apply:*

*Metric: Each milestone will be awarded points as follows based on accomplishment of that milestone:*

<i>Outstanding</i>	<i>Bettering a milestone date by &gt;30 days</i>	<i>4 Points</i>
<i>Excellent</i>	<i>Meeting a milestone date</i>	<i>3 Points</i>
<i>Good</i>	<i>Missing a milestone date by &lt;45 days</i>	<i>2 Points</i>
<i>Marginal</i>	<i>Missing a milestone date by &gt;45 days</i>	<i>1 Point</i>
<i>Unsatisfactory</i>	<i>Missing a milestone date by &gt;90 days</i>	<i>0 Points</i>

*The evaluation of the Performance Measure will be the numerical average of the scores of the supporting milestones.*



### Accomplishments - Summary

BNL has continued to improve its Information Technology infrastructure by continued emphasis on Cyber Security and by strengthening the Scientific Computing infrastructure. Achievements in each of these major areas are indicated under the respective performance measures, 3.4.1 and 3.4.2.

The beginning of FY02 saw a major shift in approach, as the Information Technology Division (ITD) is now focused on developing and establishing those initiatives and services that add strategic value to the Laboratory. One key example is the use of the Visualization Program as a model for developing new Centers of Excellence, which will provide support for the Laboratory's scientific mission. This new focus represents a distinct departure from the past and is being funded/resourced through a major internal restructuring of ITD. This result is only possible due to the Division's extensive internal improvement program that was implemented over the last several years.

### Results

Score (0-4.0)	Rating	Schedule Status
3.25	Excellent	On Schedule

### Issues and Trends

The major challenge remains that of developing a secure computing/communications infrastructure that enables, rather than negatively impacts, BNL's science mission. This includes

the appropriate design, implementation and maintenance of BNL’s Cyber Security Program Plan as well as the design, growth and maintenance of computing services that support and attract scientific programs to the Laboratory. The issue of acquiring appropriate resources to initiate programs in both of these major areas as well as maintain a high-level of ongoing support has been an ongoing problem which has not yet been completely solved.

### 3.4.1 Cyber Security

#### Accomplishments - Summary

The implementation of the original BNL Cyber Security Program Plan (CSPP) is nearing completion with the progress of pilot programs in the areas of strong authentication and application strategy. The results of these pilot programs have indicated unexpected complexities within the Laboratory infrastructure, necessitating changes in strategy in both areas. In spite of the challenges, in both cases the associated performance measure milestones are being met, as detailed in 3.4.1.1.

At the same time as we are completing the initial CSPP, the Laboratory is making preparations for developing the next version of the plan. The processes needed to make the CSPP responsive to various drivers (e.g. DOE directives, technology, changes in threats) are being put in place, as described in the milestones noted in 3.4.1.2. The update/review of the current CSPP is actually underway, and is the first implementation of the recently established CSPP review process. Processes are also being established for other initiatives that will drive changes to the CSPP, such as scientific program/network requirements, MITTENS data, threat analysis, and the predicted Cyber Security Paradigm shift. Information on progress in each specific area is found in 3.4.1.2.

As these initiatives have moved forward, emphasis has been placed on including BNL management in the processes that affect changes to the CSPP. The overarching guideline is to ensure that the BNL science mission is protected, yet not negatively impacted by cyber security measures.

Management focus for the next quarter will be on passing the next major Cyber Security audit scheduled for the first quarter of FY03. A satisfactory grade would be interpreted as evidence that the basic elements of the BNL CSPP have been effectively implemented.

#### Results

Score (0~4.0)	Rating	Schedule Status
3.15	Excellent	On Schedule

#### Notes

See the notes for 3.4.1.1 and 3.4.1.2

#### Issues and Trends

Preparing for the Cyber Security Paradigm shift remains a priority and significant challenge. Success in understanding the impacts that the paradigm shift will have on the BNL plan will be limited without Cyber Security having an expert in this area, which includes threat/risk analysis. Cyber Security has defined a new position to provide expertise in this area, and it is critical that BNL attracts the person with the right skills and talents.

Another major issue is the funding cuts by the DOE Office of Science, which will affect BNL's ability to address the Counterintelligence (CI) finding regarding the access of foreign nationals to systems and applications. Through pilot programs and their evaluations, BNL has determined that a comprehensive approach to the CI finding is unaffordable and even if resources were available could not be accomplished within a practical timeframe. A more restrictive project scope, focused on BNL critical systems, would be achievable. However, FY03 funding (approximately \$500K) for the restricted scope strategy was not approved by DOE. Consequently, it will not be possible for BNL to properly address this area, which is the last remaining layer in the BNL CSPP architecture and the only layer that differentiates one host from another.

Until DOE funds this initiative, BNL must remain in its current state of:

- 1) having an incomplete architecture
- 2) failing to address the CI finding

During the recent Cyber Security review for FY04 funding, BNL reminded the DOE reviewer of the failure to fund this initiative in FY03. To date there has been no response indicating that funding will be restored. The unanswered question is how BNL can be held accountable for meeting this Cyber Security requirement while, at the same time, not being granted the necessary funding.

### 3.4.1.1 Cyber Security Program Plan Implementation

#### Accomplishments - Summary

The completion of the Laboratory's Cyber Security Program Plan (CSPP) is on schedule. Focus for the beginning of FY02 has been on the areas of strong authentication, host-based security and application strategy. Kerberos pilot results have changed the approach originally planned for developing a strong authentication system. The original pilot, indicated a conflict with the BNL infrastructure. A new strategy was proposed and implementation begun, using LDAP (Lightweight Directory Access Protocol) as the common API. Good progress has been made in this area during the second quarter of FY02, via internal/external pilot programs. In addition, deployment of HP Openview agents (Radia) has continued, with emphasis on the scientific desktop. This initiative is considered complete, with the understanding that we are in "maintenance mode", i.e. that Radia agents will continue to be installed as desktops are replaced/added, on both the Scientific and Operations areas of the Laboratory. The implementation of the Cyber Security Application strategy was begun as scheduled, via a pilot program (Melillo) which validated the technology. Discussion with the vendor about the results of the pilot revealed that BNL infrastructure issues would make full deployment an impossibility, i.e. very costly and time-consuming. Subsequent discussions have focused on limiting the scope to critical systems in order to most effectively balance requirements against cost.

#### Results

Score (0~4.0)	Rating	Schedule Status
3	Excellent	n/a



Milestone	Milestone Date	Actual or Projected Date	Points
Complete the deployment of Kerberos	3/31/02	12/31/01	4
Complete the deployment of HP Openview	12/31/01	12/31/01	3
Implementation of the Cyber Security Application strategy developed in FY01	1/31/02	3/11/02	2

## Notes

1. The original Kerberos pilot was completed ahead of the scheduled milestone date, with the conclusion being that the original Kerberos implementation conflicted with NIS (Network Information System) functionality. Migration to NIS+ was considered but also determined to be an unreasonable approach in the BNL environment (e.g. platform support issues). A new approach, using LDAP as the common API Kerberos was proposed. A request to add a new performance measure milestone for the implementation of a Kerberos/LDAP pilot was generated and has received approval from DOE. This will result in an additional milestone being added to 3.4.1. The proposed completion date for the new LDAP/Kerberos pilot is 09/30/01.
2. The Radia agents have been installed on approximately 75% of the administrative and scientific desktops. This was accomplished by the target date of 12/31/01. Over 2200 scientific desktops now have the Radia client.
3. The application strategy defined a pilot program for establishing a mechanism for determining access to systems and applications across the site. The pilot was accomplished on schedule. The results indicated that the technology was useful and relevant, but many questions were raised regarding infrastructure requirements. Further discussions with the vendor (Melillo) were held, leading to the growing conclusion that the deployment strategy be focused only on critical systems.

## Issues and Trends

See Issues/Trends under Performance Measure 3.4.1

### 3.4.1.2 CSPP Test, Review, and Evaluation Mechanisms

#### Accomplishments - Summary

A number of initiatives are underway in order to ensure that the BNL CSPP remains responsive to the rapidly evolving cyber security risks, but yet does not negatively impact the Laboratory mission. During the first quarter of the fiscal year, a Cyber Security Program Plan (CSPP) update/review process was developed and presented to the Cyber Security Advisory Council (CSAC). In response to a DOE request, this review process now includes BNL Line Management in addition to CSAC, Cyber Security Operations, etc. During the second quarter, deployment of this new review process has been deployed, as the most recent changes in the CSPP have been presented to, and discussed with BNL managers. Plans are also underway for utilizing the results of the MITTENS tool. The strategy as to what information is most useful for

BNL system administrators has been determined, and the ownership of plan development has been assigned. Formulation of bridging plans in the areas of networking and scientific computing are in progress, and will be key elements of the formal process for ensuring that additional cyber security investments are not overlooked. Elements of a formal threat analysis program have been implemented and a high level strategy for dealing with the predicted Cyber Security “paradigm shift” have been defined. See the Notes Section for additional information.

**Results**

Score (0~4.0)	Rating	Schedule Status		
3.2	Excellent	On Schedule		
Milestone	Milestone Date	Actual or Projected Date	Points	
Establish a formal review process for the CSPP	12/31/01	10/31/01	4	
Establish a plan for utilizing the results produced by the MITTENS	4/30/02	4/30/02	3	
Establish a process for the review of scientific IT requirements	4/30/02	4/30/02	3	
Introduce a formal threat analysis program as described in the BNL CSPP	9/30/02	9/30/02	3	
Develop a plan for responding to the Cyber Security “paradigm shift”	9/30/02	9/30/02	3	

**Notes**

1. A process for reviewing and updating the CSPP was defined and presented to the Cyber Security Advisory Council (CSAC) for discussion during October, 2001. The process, which emphasized the inclusion of BNL line management in the CSPP review/update process, is now being implemented.
2. Mechanisms for using the results of the MITTENS tool, and distributing the information site-wide have been discussed within Cyber Security Operations. A formal plan is under development. The CSPP update/review process described in item 1 includes mechanisms for incorporating new threats into the plan.
3. A process is being developed for capturing the cross-dependencies between scientific IT requirements and their impact on the BNL Cyber Security program; specifically as to how these would drive additional IT investments. Key to this process are the bridging plans that define Scientific/networking requirements. Budget impacts and cross-dependencies are captured during Staff meetings and Section Budget meetings, specifically: 1) Capital program budget review 2) New program budget review meetings.
4. The elements found in a formal threat analysis program have been defined, and many have been implemented. These include, e.g.: the ERA Information Security assessment, vulnerability/penetration studies, ongoing monitoring, and the PDN risk analyses.
5. The high-level strategy for attacking the coming Cyber Security “paradigm shift” has

been developed and was a key part of the Cyber Security Budget presentation for DOE/Chicago in March, 2002. This included an outline of the expected changes (new attack scenario), planning assumptions and expected costs.

### 3.4.2 Scientific Computing Infrastructure

#### Accomplishments - Summary

All major elements of the performance measure for Scientific Computing have either been accomplished as projected or are on schedule (see 3.4.2.1, 3.4.2.2, 3.4.2.3). The goal is to improve the rate of growth in providing Scientific Computing services, and to continue to enhance the recently established Scientific computing centers of excellence: Visualization, Grid Technology, and the Code Center. In parallel, the challenge continues to improve those common Scientific Computing resources used by all Laboratory science programs and develop new programs/services that are vital to the Scientific mission of BNL. The hiring of two post-doctoral candidates in the Visualization and Parallel Computing areas will definitely foster more rapid growth within the Visualization program, but additional resources are required to expand support in other equally vital areas. Actions are being taken to address the infrastructure of the BNL Computing Facility and those scientific computing services provided within it. In the coming quarter, management will continue to view the computing needs of BNL’s scientific programs as a priority, and focus on determining how Information Technology services can be improved to better support the scientists. In addition to ensuring that its established services will continue to provide value-added services to the Scientific and Technical departments/divisions, ITD will give a high priority to initiating a dialogue with BNL’s major User Groups. This includes the development of processes for formal, direct, and continuing involvement with these organizations. The Division will also undertake a review of all IT services with the primary guideline being to understand the value that the services have (or may not have) for the BNL User Groups.

#### Results

Score (0-4.0)	Rating	Schedule Status
3.39	Excellent	n/a

#### Notes

See the notes for 3.4.2.1, 3.4.2.2, and 3.4.2.3

#### Issues and Trends

The challenge is to ensure that ITD’s Scientific Computing services remain strongly connected to the BNL scientific programs. This includes, as a minimum, improving communication techniques in order to 1) make sure that the Scientific Computing services under development are those needed by Laboratory programs, i.e. they add value, and 2) ensure that the user community is aware of the availability of the Division’s Scientific Computing services.

An ongoing issue is the need for increased resources to expand and sustain these new Scientific Computing service initiatives. Recognizing that BNL funding will be limited, ITD has been investigating how its’ internal resources can most effectively be redeployed in order to more effectively support the needs of BNL’s Scientific community.

### 3.4.2.1 Visualization Program

#### Accomplishments - Summary

The implementation of a high-speed visualization system nears completion, with the recent arrival of the necessary hardware. Installation is expected to be fully completed in mid-April. In the last quarter, parallel processing techniques have been developed for use on a Linux Cluster. The Visualization Program was further strengthened by the recent addition of two post-doctoral candidates. Methods of supporting visualization to the desktop are being developed and hardware evaluated. See the Notes Section for details.

#### Results

Score (0~4.0)	Rating	Schedule Status		
3.0	Excellent	Ahead of Schedule		
Milestone		Milestone Date	Actual or Projected Date	Points
Implement and support a high-speed visualization system		2/28/02	4/15/02	2
Develop and deploy remote visualization methods		6/30/02	6/30/02	3

#### Notes

The resultant End-of-Year rating for the Performance Measure Metric 3.4.2.1 for the Visualization Program will be raised to a 3.0 (Excellent).

1. Visualization software was developed using parallel processing techniques. Cluster hardware was ordered during 12/01 and received on 3/29/02 (later than expected due to vendor delays). Implementation of the high-speed visualization system is projected to be completed by 4/15/02.
2. Several remote visualization methods were established and are being tested. Via the NSF project, high quality visualization over long distances was explored. An IBM high-resolution display was evaluated, focusing on improving quality to the desktop. Work was done with Argonne National Lab in the development of parallel processing techniques and on the reconstruction of tomography datasets. Two post-docs have been hired with expertise in the fields of parallel processing and visualization.

### 3.4.2.2 Computing Resources

#### Accomplishments - Summary

The upgrade of ITD's high-performance computing resources are on, or ahead-of schedule. All of the required hardware is on site and will be installed by mid-April. The preliminary work, including infrastructure support, for the Riken prototype configuration (QCDOC machine) is in progress. This includes plans to augment the current Uninterruptible Power System (UPS) in the BNL Computing Facility (BCF). This will result in the ability to provide both the new Riken machine as well as the production machine (which previously was not on the UPS) with uninterruptible power. In addition, the production Riken machine (QCDSF) is being

reconfigured to provide a test-bed for the QCDOC machine. See the Notes Section for other details on this quarter's achievements.

**Results**

Score (0~4.0)	Rating	Schedule Status		
3.5	Excellent	n/a		
Milestone		Milestone Date	Actual or Projected Date	Points
Upgrade the high-performance computing resources required for support of Laboratory scientific initiatives		9/30/02	4/15/02	4
Commence installation and testing of a prototype configuration for the BNL Riken QCDOC machine		9/30/02	9/30/02	3

**Notes**

1. The high-performance computing resources have been enhanced by the installation of a Storage Area Network for Linux and SUN, deployed in the quarter of FY02. Cluster hardware has been received and will be installed by 4/15/02.
2. Preparatory work for BNL Riken QCDOC machine is underway. This includes a substantial expansion of the BNL Computing Facility's UPS to one megawatt, which will enable support for the Riken machines. In addition the current Riken machine, QCDSF, is being reconfigured to allow it to function as a test-bed for codes that will eventually run on QCDOC. ITD has also provided Columbia University with the hardware/software that is allowing them to run simulations of the new chip that is central to the design of the QCDOC machine.

**3.4.2.3 New Technology Implementation Assessments**

**Accomplishments - Summary**

Several New Technology Implementation Assessments (NTIAs) have been established, in support of specific Laboratory scientific initiatives. In all areas, milestone targets are on, or ahead of schedule. Achievements include: The integration of the Java language into the AGS Controls Group; conversion of the Climate model code to take advantage of parallel processing; and the initiation of a working group to support Grid technology. The latter will impact a number of multi-site collaborations, such as US Atlas. Additional details can be found in the Notes Section.

**Results**

Score (0~4.0)	Rating	Schedule Status		
3.67	Outstanding	n/a		

Milestone	Milestone Date	Actual or Projected Date	Points
Perform a prototype New Technology Implementation Assessment	7/31/02	7/31/02	3
Establish a service for Parallel Processing Conversion of legacy computer codes	2/28/02	1/15/02	4
Computational Grid technology program	9/01/02	3/30/02	4

### Notes

1. The Java language is being integrated into the AGS controls group by D.Stampf (a member of ITD's Scientific Computing Services Section). The code is being completed and is in testing.
2. A service for parallel processing conversion of legacy codes was established. One example is L.Slatest's (ITD Scientific Computing Services Section) work on the parallel processing conversion of the Climate model code.
3. An ITD Computational Grid Working group has been established. The group members have educated themselves on the grid technology and have been attending the Globus meetings. A 7-node test cluster has been established within the Division. A proposal for an Access Grid node (required by ATLAS/CDIC) was developed. Most of the hardware components have arrived, including the video capture boards and the required computers. The Linux operating system will be installed on the computers by the end of March, 2002.

## 3.5 Communications and Trust

### Objective Description

*The Laboratory will enhance the foundation of trust and confidence it has built by: strengthening existing relationships and building new relationships with key stakeholders, elected and appointed officials, civic leaders, and other important constituencies; effectively communicating the Laboratory's scientific initiatives and accomplishments; generating community enthusiasm for Laboratory research programs; and working to fulfill the education mission shared with DOE.*

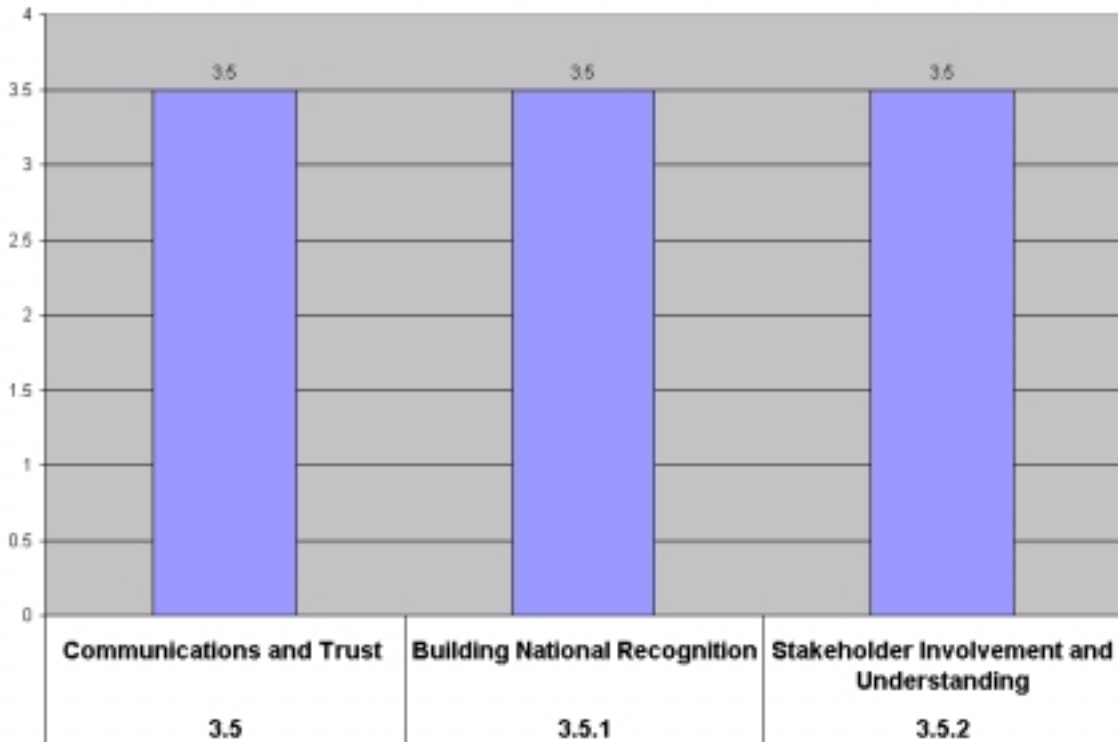
*The weight of this Objective is 10%.*

#### *Purpose and Supporting Information*

*The Laboratory's Communications, Community Involvement, and Education Program plans serve as a guide to the many activities and initiatives that will be pursued in FY02 to fulfill this objective and to help meet the expectations and performance measures of science and operational departments and divisions across the Laboratory.*

*Each element of the plan will include associated self-assessment activities for the appropriate organization (e.g. CIGPA, Departments, and Divisions). Stakeholder feedback will be collected and research and self-assessments will be conducted throughout the year to determine program effectiveness, to evaluate program utility, and to make mid-course corrections as necessary.*

*Performance towards this objective will be based on accomplishment of the goals set forth in the Communications, Community Involvement and Education plans. BNL and BAO will conduct an independent peer review process or other selected process that both parties agree is necessary and appropriate to evaluate the Laboratory's communications, community involvement, and education programs. The peer review or other process selected will focus primarily on the measures below.*



### Accomplishments – Summary

- Laboratory developed and implemented strategic plans to promote priority science initiatives with special focus on issues such as nanoscience and antiterrorism.
- Communications efforts provided national recognition of scientific discoveries in physics, chemistry, biology, energy sciences, and medicine.
- Continued on-going programs designed to foster open and frank exchanges of ideas with key community groups and important stakeholders.
- Engaged in a systematic effort to contact local elected and appointed officials and selected individuals who are opinion leaders in neighboring communities to help identify issues and areas of concern.
- Provided training for Level 1 and 2 managers to develop and/or enhance community involvement skills.
- Currently developing an issues anticipation process and improving the Laboratory's ability to track news articles via a mechanized database.
- Expanded and enhanced the content, readability, and attractiveness of the BNL website.
- Reorganized OEP (Office of Educational Programs) and began development of a strategic plan to guide accomplishment of BNL and DOE's shared educational goals.

## Results

Score (0~4.0)	Rating	Schedule Status
3.5	Excellent	Ahead of Schedule

### Notes

It is difficult to describe with any rigor the effect that the transition of Dr. John Marburger from Laboratory Director to a member of the Bush Administration will have on Communications and Trust. Dr. Peter Paul, the Laboratory's Interim Director, participates in many community/BNL activities, e.g. CAC (Community Advisory Council) meetings, and enjoys recognition and credibility with many community stakeholders. When a new Director is appointed, the challenge will be to help the new Laboratory head establish recognition and credibility in timely fashion.

### Issues and Trends

Issues for the balance of FY02 are centered on continued Communications and Trust between the Laboratory and the community include: Cesium 137 contamination in deer, Building 801 rainwater occurrence, Building 850 sump outfall, placement of Operable Unit 3 remediation facilities and access issues, contents of offsite plumes, Operable Unit 5 remediation techniques as well as risk assessment and cleanup goals, and BGRR cleanup.

### Assumptions

A timely appointment of a new Lab Director.

## 3.5.1 Building Regional and National Recognition

### Accomplishments - Summary

Contrary to expectations at the beginning of FY02, RHIC was not the Laboratory's leading science story for the first half of the year. BNL scientific proposals aimed at countering terroristic threats captured press attention with stories appearing in The New York Times, Newsday, Discover Magazine, and a number of Long Island weeklies, as well as broadcast on News 12. There were several NYC radio interviews with BNL researchers. Press kits outlining the Lab's scientific proposals and activities were prepared and distributed in support of the Lab's antiterror team.

A Nanoscience Workshop also garnered significant national recognition for the Laboratory. Congressmen Sherwood Boehlert and Felix Grucci participated as speakers along with Dr. Pat Dehmer of DOE, Russell Bissette of NYSTAR, and more than a score of notable scientists from around the world. More than 400 scientists attended the workshop. Press interest was relatively keen for such esoteric subject matter with The New York Times, Newsday, UPI and science writers from special interest publications attending. Communications support included preparation of special printed materials, a dedicated web site address, printed and electronic advertisements to generate attendance and recognition, communications with elected officials, a targeted press outreach, and counsel and support to the scientific sponsors.

New brochures and fact sheets designed to foster public understanding of BNL science were produced in FY02. Subjects included: nanoscience, addiction research, technology transfer, CIRC, RSVP, AGS, LEAF, NSLS and the RHIC detectors.



The Laboratory is developing a new science magazine, the first issue of which is currently being revised in anticipation of printing in April.

In addition to designing a special Nanoscience page on the web, the Laboratory has completed a broad upgrade of all the website general information pages, along with an upgrade of the RHIC pages. Special attention will continue to be paid to checking links, timely revisions of temporal information, and assisting departments and directorates that wish to redesign their websites to match the Lab's general pages. Enriched web content added during FY02 includes new material on SNS, ATLAS, and polarized protons. A strong effort is made to revise the main page on a daily basis to maintain freshness. Similar efforts have been exerted in revising the Lab's Office of Educational Programs (OEP) web pages. Webmasters of science education web sites were also contacted and asked to include links to BNL's OEP web site. This resulted in more visitors being referred to the BNL web site. Additional areas will be added to the web site in the second half of this year. These areas will provide resources for teachers and students related to the scientific research being carried out at BNL.

The OEP has developed a new vision statement and is developing a strategic plan to guide its activities beyond FY02. A major effort that could help bring about regional and national recognition is the Online Classroom Project. This project will use technology to showcase the scientific research being done at BNL in the form of learning activities for students and resources for teachers.

**Results**

Score (0-4.0)	Rating	Schedule Status
3.5	Excellent	n/a

**Notes**

The G-2 investigation, polarized proton collisions at RHIC, and a soon to be published paper on abuse of inhalants could be the next areas to generate press interest in BNL science.

**3.5.2 Stakeholder Involvement and Understanding**

**Accomplishments - Summary**

To help promote frank and open dialogue with the community, the Laboratory has provided meeting accommodations, facilitation services, and administrative support (typing, minutes, correspondence) for six monthly meetings of the Brookhaven Laboratory Community Advisory Council (CAC). These meetings included 18 presentations by BNL personnel to the CAC on issues of importance to the community such as the Peconic River; BGRR; anthrax, anti-terrorism, security, science, G-2 contamination issue, cesium contamination in deer, groundwater and budget. Each presentation was preceded by one or more dry runs with presenters, other subject matter experts, and community involvement staff participating.

Lab personnel also supported a CAC sub committee investigating appropriate pilot cleanup studies for the Peconic River, including an electrochemical remediation pilot project, a proposed

revegetation plan and cleanup goals, sediment removal, wetland restoration, and vacuum guzzling pilots, and phytoextraction. The sub committee's goal is to develop sufficiently detailed information so that the CAC can provide meaningful community input and advice to the Lab regarding community views on remediation activities.

The Laboratory also supports two independent working groups interested in the Peconic River and BGRR D&D.

In cooperation with the Boy Scouts, the Lab's Atomic Energy Merit Badge program was conducted in December. Seventy-nine scouts and 34 adults, including scout masters and parents, attended. The program continues to be in high demand due to its reputation.

Six hundred eighty five college and professional participants along with 445 five high school students toured the Lab in the first two quarters of FY02. Visitors included Sheriff of Suffolk County; elected and appointed government officials and staff, Suffolk County Department of Health Services High School Youth Empowerment Conference, and the CEO of Battelle. Nine unsolicited letters citing program excellence were received.

Longwood High School Teacher Conference Day and Sachem Mentoring Day were hosted by the Lab. High evaluation marks were received with an indication that the programs will be repeated next year.

The Lab, through its participation in the Pine Barrens Commission, has prepared the first fire protection assessment on Long Island, which will be used as a model for other organizations; the Lab participates in training local firefighters and meets quarterly with three mutual aid fire departments.

BNL's Safeguards and Security group has met with ten school superintendents to discuss security matters at the Laboratory following the September 11 World Trade Center tragedy.

Laboratory personnel have systematically contacted 28 selected, key stakeholders during first and second quarters of FY02. These include six elected officials, six appointed officials, a police chief and members of the health care, business, education, and not-for-profit sectors. The purpose of these contacts is to maintain or establish professional relationships and to identify concerns and issues and gather input from these key stakeholders.

Sixty percent of Level 1 and 2 BNL managers have attended community involvement (CI) training along with 17 BAO managers. The Laboratory hosted a two-day meeting with representatives of the U.S. Department of Defense (DOD) to discuss best practices in CI and DOD is considering modeling a program based on BNL CI guidelines.

The Lab's Issues Anticipation Process has been developed and is currently under review It is expected to be deployed in late FY02 following any required revision. It will be linked to the Article Tracking Database as appropriate.

The BNL Office of Educational Programs (OEP) has developed a new vision statement and is developing a strategic plan to guide its activities beyond FY02. OEP has provided on-site educational experiences for 29 undergraduate students via its Energy Research Undergraduate Laboratory Fellowship and College Mini-Semester programs. Since the beginning of FY02,

these programs have hosted 96 students and eight teachers for Career Day activities in cooperation with Brookhaven Women in Science, and welcomed more than 200 students per week at the Laboratory's Science Museum. Twenty-six high schools sent 303 students to the Lab's annual Bridge building contest and 31 students competed in the Science and Society Essay Contest.

**Results**

Score (0~4.0)	Rating	Schedule Status
3.5	Excellent	n/a

**Notes**

The Lab's Issues Management Process identifies and analyzes issues through press reports, contacts with key stakeholders, and input from the community via meetings, roundtables, on-site visits and similar contacts. Appropriate feedback to the community is a standard element of BNL community involvement activities.

**Issues and Trends**

Due to modified priorities, partly as a result of 9/11, Partnership BNL activities will be initiated in the second half of FY02. A decision has also been made to push circulation and implementation of an enhanced employee communication plan into the second half in order to benefit from the anticipated selection of a new Lab Director.