Part I

Summary of Performance Toward the Critical Outcomes

DISCLAIMER

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1.0 Scientific & Technological Excellence

The Laboratory intends to be the most relevant and productive supplier of science and technology, focused around our environmental science and technology mission, and with significant contributions in our energy, national security, and health work.

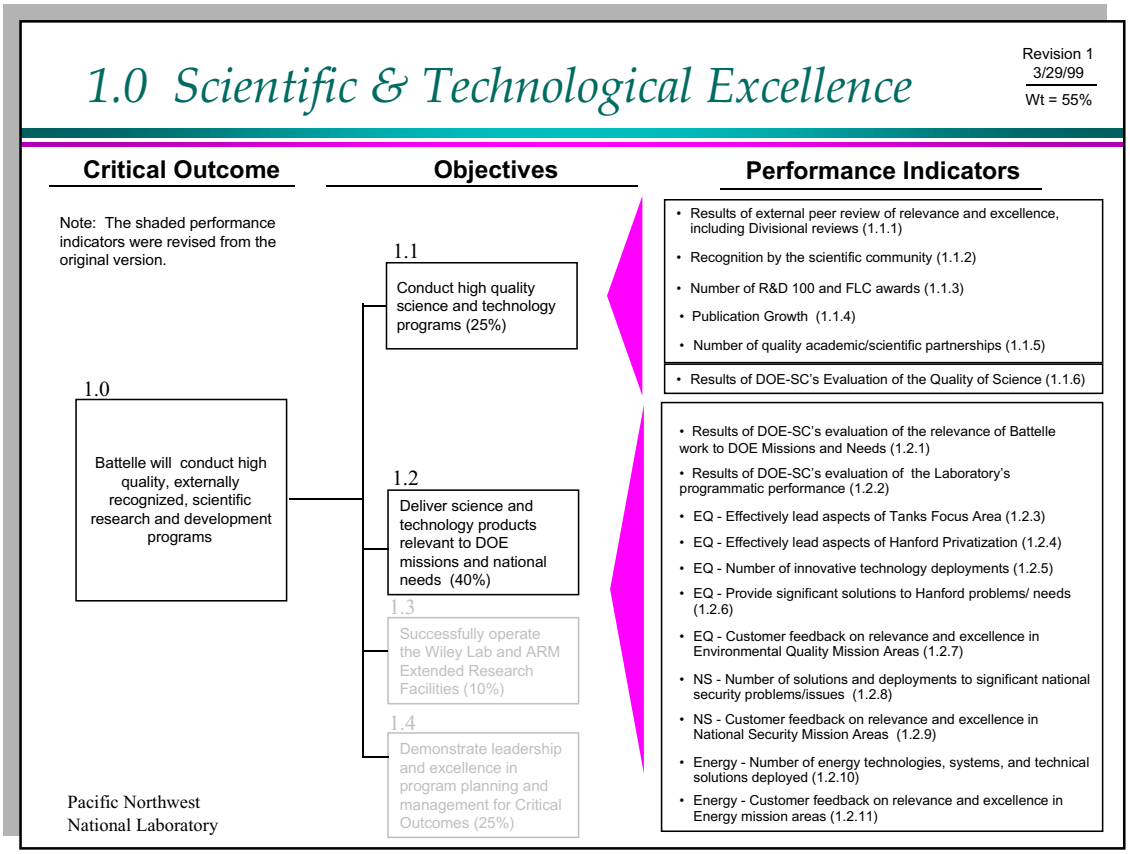
We intend to continue to strengthen the scientific core of our Laboratory, improving both the quality and scientific impact of our basic research programs and strengthening their tie to outcomes important to DOE, Congress, and the public.

We seek to operate our research and user facilities, as well as our programs, with distinction.

Finally, we are continuing our emphasis on partnerships for scientific research and education. We continue to increase the fraction of our research that is carried out in partnership with the university community as well as providing research participation opportunities to visiting students.

For these reasons, and in partnership with DOE, the Laboratory has established the following Critical Outcomes, objectives and performance indicators to guide our efforts and to monitor our progress.

Page 1 of the Scientific & Technological Excellence Critical Outcome Tree, detailing the Critical Outcome and its' supporting Objectives and Performance Indicators, is presented below. Page 2 of this Critical Outcome Tree is presented in the discussion of Objective 1.3.



Summary

The Laboratory is clearly conducting high-quality, scientific research and development programs that are providing new insights and solutions to key technical issues facing the nation and the world. External peer reviews of major programs recognized our programs as achieving national and international recognition for excellence in experimental research, for the breadth of our research programs, and as having staff and facilities of the highest caliber. The relevance of our work is further indicated by our outstanding success rate in capturing critical proposals for new work.

The Laboratory received significant external recognition in FY1999 including an impressive six R&D 100 and two FLC awards. In addition, the quality of our scientific efforts are reflected by the breadth of staff that were recognized for their scientific and engineering excellence in terms of awards, invited talks, and participation on scientific committees.

Over the past four years the Laboratory has experienced a declining trend in the number of publications in peer reviewed journals. This was corrected during FY1999 however, when we published 606 publications, reflecting 19% growth over the past three years and for exceeding the FY1998 total.

The laboratory continues to deliver S&T products that are relevant to DOE missions and national needs. Eleven technologies were successfully demonstrated for a variety of customers at numerous government and commercial sites across the country and overseas. However an overall decline in EM-50 budgets has begun to affect our abilities to maintain this pace. The Laboratory is however, meeting expectations with respect to addressing Hanford-related problems.

Specific feedback provided by DOE on our leadership and support of the national Tanks Focus area and the Hanford Tanks Privatization effort is characterized as "exceeding expectations". Future efforts should focus on strengthening the integration of the basic sciences and bringing more strategic balance back into the investment portfolio.

Evidence of our contributions in the national security area is demonstrated by the development and deployment of solutions and technologies designed to address global and national security issues. The specifically identified efforts by PNNL's National Security Division staff have provided solutions across the set of Office of Nonproliferation and National Security's (DOE-NN's) identified priorities to reduce the international proliferation threat. Our projects' customers acknowledge the high performance level of our delivery of our desired products and services - the **average** rating for project performance for projects within the National Security Mission Area is over 4.6 on a 1-5 scale. High level customers are also pleased with our ability to provide leadership both nationally and to programs entrusted to PNNL - interviews with NN-1, IN-1, and CN-1 yielded an **average** rating of 4.67 on a 1-5 scale.

In the energy mission area we deployed technology through systems and software solutions that support building energy efficiency while increasing reliability and safety of these systems at the same time.

Our annual survey of Laboratory critical projects provided feedback that customers have "high regard for our staff" and that staff exhibit personal attributes that are valued by the customer such as commitment and trust while also providing very high quality technical expertise to meet customers' needs. Opportunities for improvement continue to revolve around the high cost of products and services.

The EMSL and ARM extended Research Facilities represent two national assets as evidenced by user satisfaction, publication productivity, and the growth and diversity of our users.

Finally, the Laboratory validated its quality, technical and managerial capabilities leadership by conducting interviews with key DOE programmatic personnel. The outcome of these interviews reflects extreme confidence by the customer on the aforementioned leadership capabilities.

Based on the evidence provided in this self-evaluation, our overall performance rating on this critical outcome is **Outstanding**.

Objective 1.1: Conduct high quality science and technology programs.

Results

Peer reviews represent one of the most profound indications of the caliber of our scientific and technological performance. Results from our peer review endeavors indicate that we have staff and facilities of the highest caliber, that our work is recognized nationally and internationally, and that we are contributing to issues important to the nation.This fact is further supported by the diverse recognition that we sustain at the state, regional, national and international levels. Furthermore, our strong performance in R&D100 and FLC competitions indicate that we are effective in the development and transfer of relevant technology. Our publications, which are an important mechanism for sharing new knowledge with the national and international community, have increased far beyond our aspirations. Finally, we continue to increase our academic partnerships, which enables the flow of new ideas, as well as high quality science and engineering staff into the laboratory, thus contributing to our continued success.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Outstanding.**

Analysis

Results of Peer Reviews: The following are the primary components of the Laboratory's peer review process:

- The Laboratory Review Committee (LRC) is composed of chairs of the Division Review Committees (DRCs). This committee reports to the Laboratory Director.
- The Division Review Committees (DRCs) ensure proper peer review of major programs/projects, product lines, core technical capabilities, and technologies. The reviews cover Division activities on a three-year rotating basis so that all work is reviewed at least once every three years.
- External Reviews are performed on specific PNNL research programs.

LRC Review:

The LRC requirements were met. The panel was convened and actions were identified for attention in FY2000.

DRC Reviews:

- Energy Division - Rated "Excellent". Example comments: "The Carbon Management initiative is a remarkable effort that can provide a frame of reference for energy work". The Division conveyed a "strong sense that the individual projects are part of a cohesive, well-planned enterprise."

- National Security Division - Rated "Excellent-Outstanding". Example comments: Safeguards and Security Product Line projects reviewed demonstrated "sound technology and rational applications". Special Programs work is being "expertly and competently addressed". With respect to intelligence projects... "PNNL is to be commended on the caliber and quality of the work and staff".

- Environmental and Health Sciences Division - Rated "Excellent-Outstanding". Example comments: The Computational Chemistry Program "caliber of the staff and the facilities are first rate". The Mass Spectrometry Program is "clearly internationally recognized". The Atmospheric Chemistry Program "constitutes a vital national resource with strong synergy with the US Global Change Research Program". EMSL is "a state-of-the-art facility, extremely well constructed and equipped".

- Environmental Technology Division - Rated "Excellent". "The ETD strategic intent is quite clear." Chemical Separations and Slurry Processing are "doing a good job in tying fundamental science to specific problems". The Radiochemical Processing Laboratory is the "model for a radiochemical facility".

All four Divisions were commended for actions taken in response to the FY1998 peer reviews.

External Peer Reviews:

- *OBES* - reviews of the Chemical Physics and Chemical Energy Programs were extremely positive in describing the projects and their principal investigators. Comments such as "Chemical Physics at PNNL has achieved national recognition for excellence in experimental research", and "The program bristles with remarkable chemical accomplishments, intriguing and useful developments in techniques, and the promise of greater things to come" (for Chemical Energy) provide indication of the quality, relevance, and impact of our science. Review results from the Materials Science Program have not yet been communicated to the Laboratory.

- *Global Change Program review.* In response to FY1998 DRC recommendations EHSD added a new DRC member with global change expertise, and he was commissioned to conduct a "Global Change Program Review" that was held June 10-11, 1999 in Washington, DC. The review panel was generally impressed with the quality and quantity of research performed under PNNL's Global Change Program. The panel noted that what is most remarkable is PNNL's approach to ensure breadth in the program, spanning a continuum, which seeks to address important challenges spanning fundamental science issues through applied research into human and physical systems to activities directed towards policy-relevant opportunities. The panel went on to identify ARM and the Technology Strategy Project as "two crown jewels" in our Global Change Program.

- *Peer Review of New Proposal Submissions.* Results from the EMSP, OBER Low Dose, and OBER Carbon Sequestration Center, and NABIR competitions were outstanding as evidenced by our success rate.
  - The results of PNNL competition for EMSP awards were outstanding. The Laboratory won 7 EMSP awards and was a partner in 9 proposals from other institutions. Of the approximately $12M available for national laboratories, PNNL staff were awarded $7.5M (62% of the total) for new EMSP research.
  - OBER Low Dose Competition: The Laboratory used a proposal selection process much like the EMSP process. The results of the competition were outstanding. Success in this competition was extremely important for the Laboratory's future in the biological sciences. Not only

were new projects obtained to replace those lost a few years ago with the redirection of OBER radiation biology programs, the proposed projects were based on cell signaling science and technology being developed under the auspices of the Laboratory's Environmental Health Initiative (EHI). The wins gave the Laboratory a credibility that was acknowledged by input on the EHI given by Martha Krebs and Ari Patrinos at the Office of Science Onsite Review held September 1, 1999. Of the five proposals submitted by PNNL, four were selected for funding, a success rate of 80%.

– Office of Science Carbon Sequestration Center Program Solicitation: Again, the results were outstanding. PNNL led an effort to form a distributed Center. The Center consortium has three national laboratories (PNNL, ORNL, and ANL), five university partners, one private research organization (Rodale Institute), one Austrian collaborator, and four USDA collaborators. Of the $3M available, the consortium Center described above won $2M. The only other Center funded was an LLNL/LBNL consortium.
– Natural and Accelerated Bioremediation (NABIR): This year only five new proposals were funded nationally, and PNNL had two of the five.

Table 1.1. Summary of Scientific Recognition

	FY97	FY98	FY99
Awards	24	24	28
Invited Talks	24	40	80
Committee Service	27	28	88
Total	**75**	**92**	**196**

Recognition by the scientific community: Staff recognition in the state, regional, national and international communities is evaluated across the three key dimensions of awards, invited talks, and committee service. In comparison to FY1997 and FY1998 levels, recognition increased significantly. Achievements across each dimension of recognition are presented below and reflect the broad context of our impact. The significantly higher results may, in part, be the result of improved data collection as well as improved technical teaming in the review of results. Table 1.1 provides a breakdown of the categories of recognition by fiscal year.

Highlights of our performance are presented below:

Awards: 22 PNNL staff members received individual international, national, state, or regional awards, five awards were shared, and the Laboratory received one award.

- Bill Chandler received the 1999 CTI World Climate Technology Leadership Award for founding a global network of energy efficiency centers in Bulgaria, the Czech Republic, the People's Republic of China, the Russian Federation, and the Ukraine.
- Mari Lou Balmer received the DOE-SC Young Independent Scientist Award.
- Mari Lou Balmer received the Presidential Early Career Award for Scientists and Engineers.
- Gary Petersen was elected chairman of the WSU Edward R. Murrow School of Communications Advisory Board.
- Joe McDonald served as Chief U.S. Delegate to the International Organization for Standardization (ISO) TC85/SC2, Nuclear Energy meeting in Berlin on September 16, 1999.

Invited Talks: 80 invited talks qualified under this indicator.

- Alan Joly presented "Ultrafast and Nanosecond Laser Induced Desorption of Positive Ions from Lithium Fluoride Single Crystals" at the 5th International Conference on Laser Ablation in Goettingen, Denmark on July 27, 1999.

- Ned Wogman. "Wide Area Environmental Monitoring Under a Fissile Material Cutoff Treaty: Technical Issues and Considerations" presented at the Workshop Concerning FMCT Verification, Detection of Clandestine Activities, Stockholm, Sweden, June 21-22, 1999.

- Joe Roop presented "Restructuring, ESCOs, and Technologies" at the 1999 Climate Technology Initiative Energy Efficiency Workshop in Yokkaichi, Japan on Sept. 20, 1999.

Committee Service: 66 staff members are currently serving on 88 science related committees. Particularly noteworthy positions include the following:

- David Senor. Chair of the Materials Science and Technology Division of the American Nuclear Society and Vice-Chair of the Nuclear Materials Committee of the Minerals, Metals and Materials Society. (July 1, 1999 to June 30, 2000)

- Gregg Lumetta organized a symposium on Calixarene Molecules for Separations held at the 217th ACS American Chemical Society National Meeting, held in Anaheim, CA on March 23-25, 1999. He is also editing a book based on the proceedings of this symposium.

- Larry Morgan was appointed (July 1999) a member of DOE's Nonproliferation and National Security Advisory Committee by the Secretary of Energy, William B. Richardson.

Number of R&D 100 and FLC Awards: The Laboratory won a total of 8 R&D 100 and FLC awards. We won 6 out of 10 entries submitted to R&D Magazine's Awards for the Top 100 Technologically Significant Processes and Products for 1999. In addition, PNNL staff won two 1999 FLC Awards for Excellence in Technology Transfer. This indicator helps us understand our strength in developing and transferring relevant technologies that are valued by the technical community.

R&D 100 Awards

- Centrate Ammonia Recovery Process (ETD)
- Compact Microchannel Fuel Vaporizer (ETD/EHSD)
- Electrodynamic Ion Funnel (EHSD)
- MicroHeater (Energy/ETD/EHSD)
- Molecular Sciences Software Suite (EHSD/Energy)
- PUMA Fiber Optic Neutron and Gamma Ray Sensor (NSD)

Federal Laboratory Consortium (FLC) Awards

- Fiber-Optic Neutron and Gamma Ray Sensor to Tennelec/Nucleus Inc. (formerly Oxford Instruments). (NSD)

- Reverse micelle technology to MICELL Technologies, Inc. (ETD/EHSD)

PNNL continues to demonstrate its science and technological excellence in these competitions as evidenced from the results in Table 1.2, following.

Table 1.2. Summary of Scientific Recognition.

National Laboratory	R&D 100 Awards (1964-99) (ranking in parentheses)	FLC Awards (1984-99) (ranking in parentheses)
Multiprogram Laboratories		
Argonne	72 (3)	19 (4)
Brookhaven	22 (10)	10 (8)
Idaho	24 (8)	6 (10)
Lawrence Berkeley	23 (9)	14 (6)
Lawrence Livermore	81 (2)	23 (3)
Los Alamos	67 (4)	13 (7)
Oak Ridge	104 (1)	24 (2)
Pacific Northwest	**51 (6)**	**41 (1)**
Sandia	56 (5)	10 (8)
Single-Program Laboratories		
Ames	14 (11)	16 (5)
Fermi	13 (12)	1 (11)
National Energy Tech Center	1 (14)	9 (9)
NREL	25 (7)	9 (9)
PPPL	2 (13)	0 (12)
Other Laboratories and Facilities		
Hanford Site	3 (11)	0 (12)

Publication Growth: Publication in the open literature is an indicator of scientific productivity and quality, as well as external recognition. Publications represent a significant mechanism by which our science and technology reaches the national and international community. In order to assess our performance we utilize the research services provided by ISI (Institute for Scientific Information). In FY1999 606 publications qualified for inclusion under this indicator. This represents a significant improvement over FY1998 results, which were disappointingly low. FY1999 results reflect a 19% increase over the average of the previous 3 years and surpassed our expectation of >5% growth, see Figure 1.1.

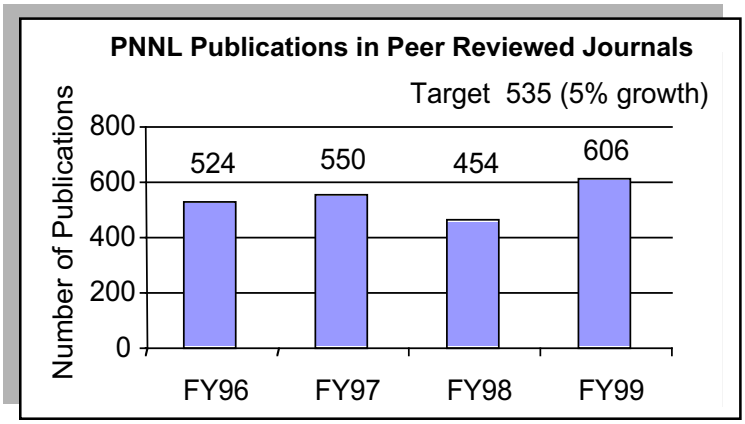


Figure 1.1

An example of the diversity of our contributions in the open literature can be seen in Table 1.3. This table presents those publications where PNNL published 5 or more articles in FY1999. A comparison to FY1996-FY1998 results is also provided.

Table 1.3. Comparison of Selected Peer-Reviewed Publications in which PNNL Staff Publish.

Publication Titles with More Than 5 PNNL Authored Papers, sorted by FY99				
Journal Title	**FY1996**	**FY1997**	**FY1998**	**FY1999**
Journal of Nuclear Materials	3	32	13	41
Journal of Chemical Physics	20	21	22	29
Surface Science	10	8	11	20
Journal of Physical Chemistry A (title change 1/97 from J. Phys. Chem.)		10	17	17
Journal of Radioanalytical and Nuclear Chemistry		3		12
Journal of the American Chemical Society	17	10	12	12
Analytical Chemistry	9	6	12	11
Water Resources Research	8	3	1	9
Journal of Physical Chemistry B (title change 1/97 from J. Phys. Chem.)		9	13	8
Chemical Physics Letters	6	3	7	7
Effects of Radiation on Materials: 18th International Symposium				7
Environmental Issues and Waste Management Technologies in the Ceramic and Nuclear Industries				7
Journal of Vacuum Science and Technology A—Vacuum Surfaces and Films	5	2	4	7
Physical Review Letters	7	6	3	7
Separation Science and Technology		1		7
Microstructural Processes in Irradiated Materials				6
Journal of Non-crystalline Solids			3	5
Journal of the Electrochemical Society	3	3	2	5
Rapid Communications in Mass Spectrometry	5	1	2	5

A large article count was observed for the Journal of Nuclear Materials. The level is high because there were 30 articles from one special issue. Special issues can cause large fluctuations in publication rates from year to year.

Evidence of the impact and relevancy of our publications can be best illustrated by the anecdotal information we receive, as opposed to simple numbers. For example, the Separations and Mass Spectrometry Group at EMSL have had three papers published as Accelerated Articles in Analytical Chemistry, the most widely cited journal in the field. Only about 50 of the 800 papers that appear annually in this journal are designated for rapid publication, within a month of acceptance.

Number of Quality Academic /Scientific Partnerships: Ninety-four (94) colleges/universities met College and University Relations criteria for institutional partnerships (e.g. informal and formal agreements, appointments, and significant interactions and collaborations) at the end of the fourth quarter. Northwest colleges/universities that represent the thirty-nine in the more substantial (that is, "robust" and "developing") categories of partnership are:

Washington State University
Oregon State University
University of Washington
State University of New York
Texas A&M
University of Idaho
University of Michigan
Montana State
University of Colorado
University of Arizona
University of Florida
Colorado State University
Iowa State University
North Carolina State
UC San Diego

University of Oregon	Eastern Washington University	University of Oklahoma
University of Utah	Georgia Institute of Technology	Whitman College
Northwestern	Ohio State University	Indiana University
Pennsylvania State University	University of Minnesota	Massachusetts Inst. of Tech.
University of Montana	University of Texas	Princeton University
Alfred University	Heritage College	University of Illinois
Oregon Graduate Institute	Stanford	University of Tennessee
UC Berkeley	UC Davis	University of South Carolina

There are also continuing interactions with 55 other academic institutions that constitute "emerging" partnerships.

In addition to these academic partnerships are ongoing interactions with 180 other colleges and universities, representing relationships that could develop into partnerships in the next fiscal year. With cumulative partnerships at 94, the best possible target of 80 was considerably exceeded. This outstanding performance can be ascribed to EMSL and to communications and marketing.

Through FY1999, EMSL continued on a growth curve in attracting new users, which increased the extent and quality of our research- and education-related interactions. Communications and marketing of PNNL-based education and research opportunities were also contributing factors in achieving this level of partnership. Among the related steps taken were: maintaining regular correspondence with the Vice Presidents or Vice Provosts for Research of more than 200 colleges and universities; printing and mailing brochures on education and research at the Laboratory; selecting campuses for site visits to meet students/faculty and attend career fairs; redesigning the College and University Relations homepage for quicker, more direct access; standardizing on-line applications for AWU and ERULF appointments; disseminating through electronic transmissions the draft Master Agreements; and promoting the on-line University Capabilities Database. Collectively, these steps differentiated the Laboratory and led to favorable recognition, which led in turn to more expressions of interest and applications, more interactions and collaborations and, thus, more partnerships. We are tapping into a very rich and diverse talent base as evidenced by the fact that approximately 50% of our entry level technical hires result from this pool.

Results of DOE-SC Evaluation of the Quality of Science: The results from the annual DOE-SC evaluation will not be available until December 1999 and hence, no definitive performance level can be provided. However, Battelle's position on the expected performance level of this indicator is that a continuation of previous year's performance levels will be sustained. The performance level offered to the Laboratory from the Office of Science has consistently been at the Outstanding level and Battelle's view is that there is no evidence to expect other than that same rating for FY1999. Figure 1.1.6 provides the historical perspective for this assertion.

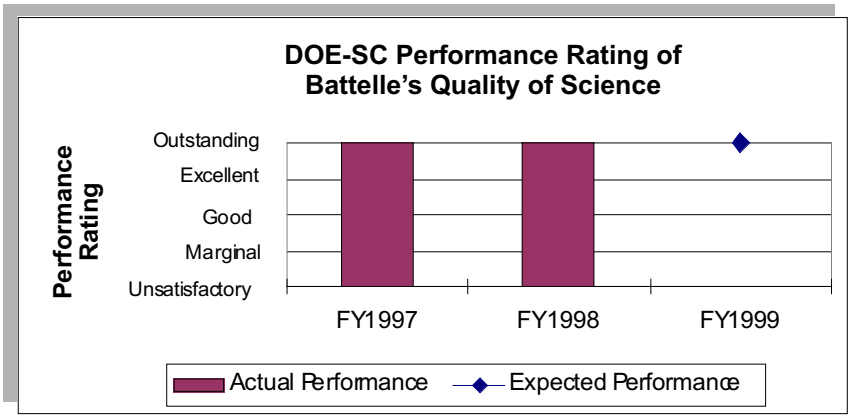


Figure 1.1.6

Objective 1.2: Deliver Science and Technology Products Relevant to DOE Missions and National Needs

Results

Overall, the results indicate that Battelle is providing significant contributions to each of the four DOE mission areas. Evidence of these contributions in the national security area is demonstrated by, for example global technology deployments aimed at preventing and detecting the proliferation of weapons of mass destruction, nuclear terrorism and smuggling, and reducing the threat posed by the operation of unsafe nuclear facilities worldwide, and supporting the implementation of a Comprehensive Test Ban Treaty. In the energy area we deployed technology through systems and software solutions that support building energy efficiency while increasing reliability and safety of these systems at the same time. In the environmental management area we deployed technology to remediate groundwater and worked to solve Hanford's most pressing problems. Finally, in the basic sciences area we are conducting high quality scientific work that is providing new insights and solutions to key technical issues facing the nation and the world.

To maintain this focus on meeting DOE missions and national needs, the Laboratory seeks feedback from customers on the strategic value and project performance of our critical projects. The results of this feedback are used to identify areas of strength and opportunities for improvement. Specific feedback provided by DOE on our leadership and support of the national Tanks Focus area and the Hanford Tanks Privatization effort is characterized as "exceeding expectations". Our annual survey of Laboratory critical projects provided feedback that customers have "high regard for our staff" and that staff exhibit personal attributes that are pleasing to the customer such as commitment and trust while also providing very high quality technical expertise to meet customers' needs. Opportunities for improvement continue to revolve around the high cost of products and services.

Based upon our progress toward the performance indicators that provide the evidence of achieving this objective, our rating for FY1999 is **Outstanding**.

Analysis

Results of DOE-SC evaluation of the relevance of Battelle's work to DOE Missions and Needs: The results from the annual DOE-SC evaluation will not be available until December 1999 and hence, no definitive performance level can be provided. However, Battelle's position on the expected performance level of this indicator is that a continuation of previous year's performance levels will be sustained. The performance level offered to the Laboratory from the Office of Science has consistently been at the Outstanding level and Battelle's view is that there is no evidence to expect other than that same rating for FY 1999. Figure 1.2.1 provides the historical perspective for this assertion.

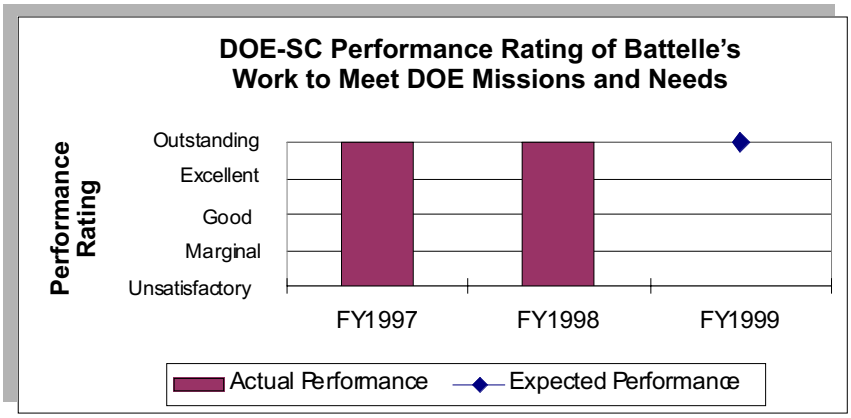


Figure 1.2.1

Results of DOE-SC evaluation of the Laboratory's Programmatic Performance: The results from the annual DOE-SC evaluation will not be available until December 1999 and hence, no definitive performance level can be provided. However, Battelle's position on the expected performance level of this indicator is that a continuation of previous year's performance levels will be sustained, if not improved upon. The performance level offered to the Laboratory from the Office of Science has consistently been at the Excellent level and Battelle's view is that there is no evidence to expect other than that same rating in FY1999. Figure 1.2.2 provides the historical perspective for this assertion.

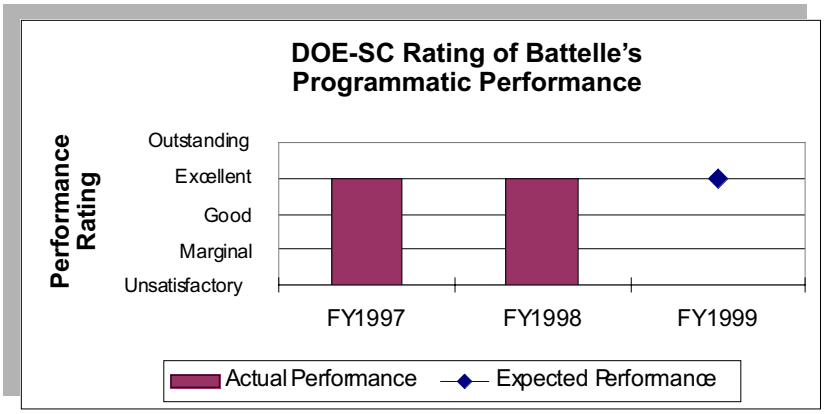


Figure 1.2.2

Effectively lead the technical aspects of the national Tanks Focus Area: Three performance indicators provide an overall evaluation of the Laboratory's effectiveness in supporting the national Tanks Focus Area. These indicators evaluate this effectiveness via:

1. Effective definition of technical solutions across the DOE complex. The TFA management team surveyed representative users from five DOE sites (Hanford, ORNL, INEEL, SRS, and West Valley), as well as DOE-HQ and DOE-RL. The Laboratory received a rating of 8.7 out of 10 possible points, slightly below our expected level of performance. As of the print date of this report, analysis has not been performed to determine the reason for this level of rating compared to the FY1998 rating of 9.3.

2. Adequate technology delivery to solve complex-wide problems. Twenty key deliverables were scheduled for FY1999, 18 were completed and 2 were dropped via approved change control. Two deliverables will be completed in early FY2000 due to circumstances outside TFA's control with both accepted as complete by DOE-RL. Completion of 100% of planned deliverables on time exceeded the Laboratory's performance expectations.

3. Adequate tracking of technical progress to baseline. The current FY1999 carryover projection is approximately 5% to 7%, compared to the target of 3%. The actual FY1999 carryover percent will not be available until November 1999.

Effectively support the Hanford Tanks Privatization Effort:

Three performance indicators provide an overall evaluation of the Laboratory's effectiveness in supporting the Hanford Tanks Privatization effort. These indicators evaluate this effectiveness via:

1. The results of a DOE-RL questionnaire that assesses the Laboratory's contribution in providing timely and high quality review and evaluation of BNFL Inc.

2. The results of a DOE-RL questionnaire that assesses the Laboratory's ability to establish an appropriate decision process for DOE-RL, providing thorough analysis of the decision, and ensuring the availability of the information needed for DOE-RL to make the decisions on TWRS Privatization issues.

3. The results of a DOE-RL questionnaire that assesses the Laboratory's ability to respond to unanticipated issues and informational requests on the TWRS Privatization Program.

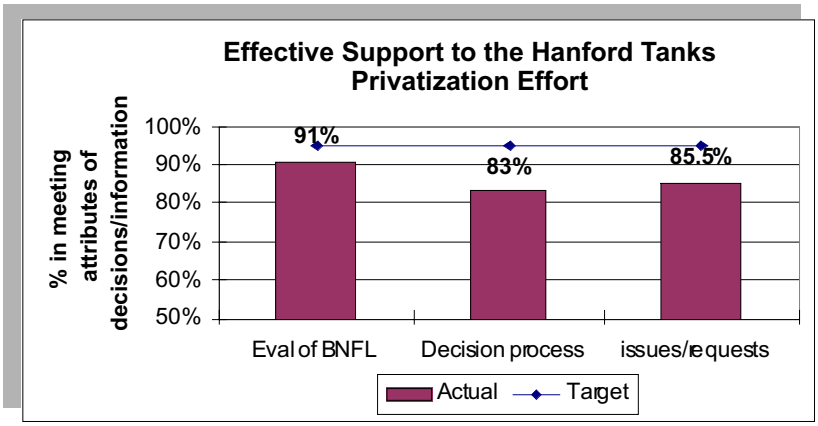


Figure 1.2.3

The results of the Laboratory's effectiveness in supporting the Hanford Tanks Privitization efforts are shown in Figure 1.2.3. Performance was below the target level in each of the indicators, however, performance exceeded the 81% exceptional performance level.

Number of innovative technologies and approaches successfully deployed in commercial practice: The number of technology deployments is not so important in comparison to *where* or the *impact* of the technology application. For this reason, a point scheme was established where:

- 2 points are awarded for technologies deployed at a Hanford or other DOE site
- 1 point is awarded for technologies deployed at other Government sites or Commercial applications
- 2 additional points are awarded if the deployed technology changes a baseline at Hanford or another DOE Site

For FY1999, Battelle continued to exhibit strong performance on the impact of environmental technologies deployed (see figure 1.2.4a) via technology deployment points as noted in Figure1.2.4b. The decline in gross points earned reflects a change in the points scale for comparison FY1999 deployment using the FY1998 scale would have resulted in 29 deployment points in FY1999. Of special note is the number of environmental technologies deployed at the Hanford site. This effort

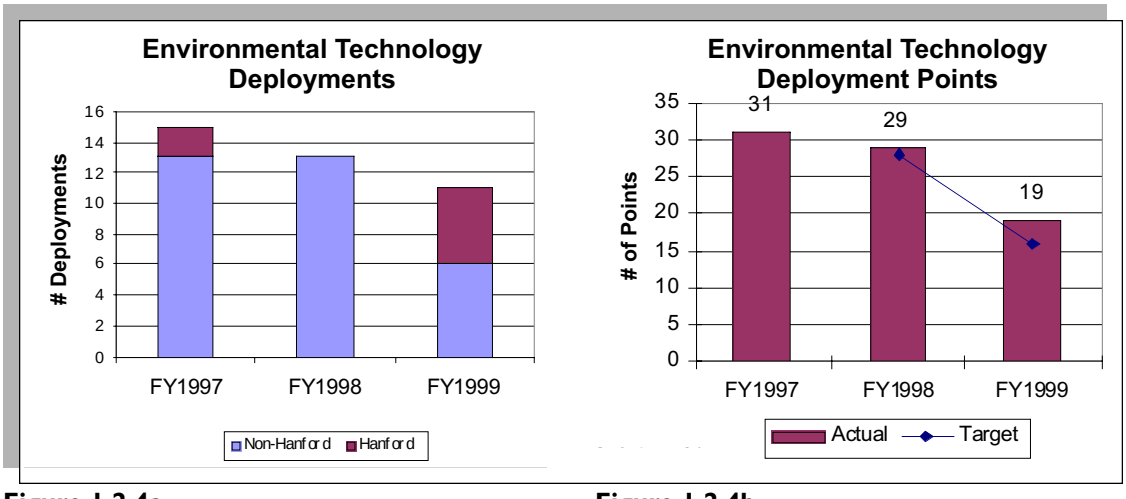


Figure 1.2.4a

Figure 1.2.4b

is the result of partnerships developed in the Hanford mission areas and reflective of the positive impact of those technologies deployed, particularly the In Situ Redox Manipulation technology which changed a cost and schedule baseline. The list of environmental technologies deployed and associated impact points is as follows:

- Six Phase Soil Heating (Commercial Chicago Site) — 1 pt
- Reverse Micelles (Commercial North Carolina Site) — 1 pt
- MEPAS Software (Commercial Ukraine Site) — 1 pt
- Six Phase Soil Heating (Commercial Seattle Site) — 1 pt
- Cs-137 Breakthrough Monitor (ORNL) — 2 pts
- Full-Scale Caustic Recovery System (DoD Watervliet Site) — 1pt
- Permanganate Treatment of Complex HLW (**Hanford Site**) — 2 pts
- Superlig 644 Cesium Ion Exchange Resin (**Hanford Site**) — 2 pts
- Remote Characterization System (**Hanford Site**) — 2 pts
- In-Line Densimeter (**Hanford Site**) — 2 pts
- In Situ Redox Manipulation (**Hanford Site**) (also a baseline change) — 4 pts

Provide significant solutions to Hanford Problems/needs: This performance indicator identifies the extent the Laboratory addresses Hanford science needs and technical gaps. A point scheme is utilized (1 to 5 points) for each project completed for Hanford clients that produce a technical product such as a report or other technical deliverable. Each proposal, including continuing Environmental Management Science Programs (EMSP) proposals, that address one or more Hanford and environmental technology needs will also be awarded one half point.

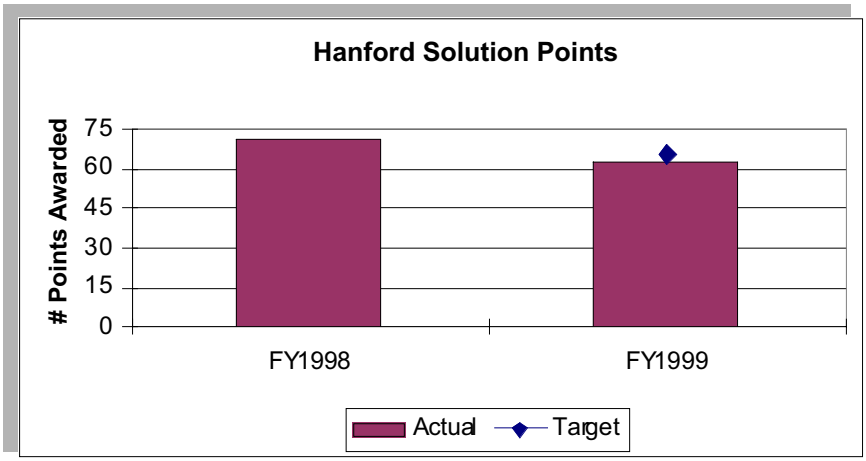


Figure 1.2.5

Figure 1.2.5 shows the number of Hanford Solutions points that PNNL earned in FY1999, totaling 62.5 points. The decline in solution points from FY1998 to FY1999 is an artifact of changes made in the point scoring system caused by the development of separate performance indicators for Waste Disposal Integration Team (*Effectively support the Hanford Tanks Privatization Effort*) and groundwater/vadose zone (*Effectively lead the technical aspects of the Groundwater and Vadose Zone Integration Project*). This change would amount to a 10 point reduction to FY 1998 total for comparison purposes. The results of this performance indicator show that Battelle continues to provide high quality support in addressing Hanford science needs and technical gaps.

Customer Feedback on Relevance and Excellence in Environmental Quality Mission Areas: This performance indicator seeks customer feedback on relevance and excellence of products and services delivered in the Environmental Quality mission areas. The customer feedback was obtained through the use of a survey. The objective of this year's survey was two-fold:

1) **Maintain a high level of performance.** The survey asks the customer's perception in two areas (strategic value and project performance). This is the third year of surveying customers where the DOE-RL deemed the performance level over the previous two years as at or near "outstanding". This indicator also intends to influence behavior related to achieving higher levels of customer satisfaction.

2) **Demonstrate continuous improvement in the project performance area.** The expectation is– if the variability of the survey responses between projects is reduced, while maintaining a high level of performance, it would represent an improvement in the ratio of customers who were satisfied versus those who are dissatisfied.

A survey response rate of 50% was achieved which is down slightly from the overall response rate of 58% last year. Figure 1.2.6 provides the average (mean) of all project results compared to targeted performance levels.

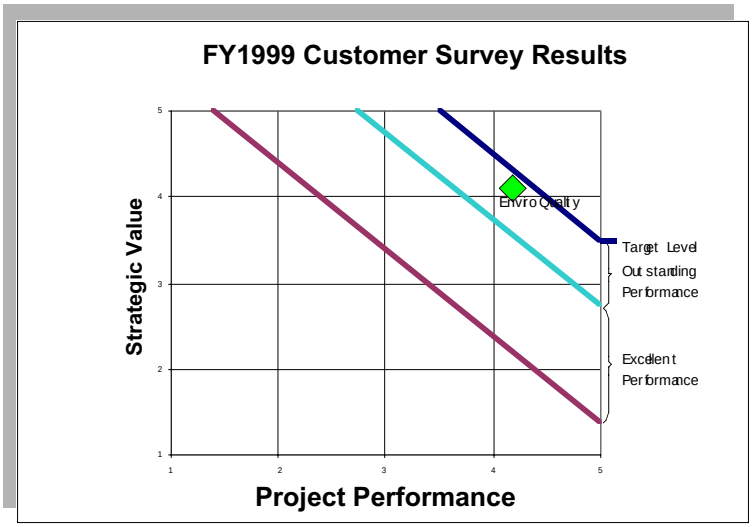


Figure 1.2.6

To demonstrate continuous improvement in meeting customers needs in the project performance area (cost, schedule, quality, etc.), the variability of the surveyed responses are compared to the FY1998 results using a standard deviation calculation, see Table 1.2.1.

Comparisons between FY1998 and FY1999 show a decline in the variability of the project performance scores indicating the customers' overall perception of project performance does not have as wide a range as last year. (i.e. Customers' responses indicate there is less disparity between customers satisfied with project performance and customers less satisfied with project performance.) Overall, Figure 1.2.6 and Table 1.2.7 suggests that customer perception of Laboratory performance for critical projects remains strong in FY 1999 and the cluster of projects at that high level are closer to the mean performance.

Table 1.2.7. Standard Deviation of Annual Environmental Quality Survey Results.

	Standard Deviation	
Mission Area	FY 1998	FY 1999
Environmental Quality	.62	.57

Number of Solutions and Deployments to significant National Security Problems/Issues: This performance indicator identifies the extent that the Laboratory addresses global and local national security needs through technology deployments or solutions to problems. A point scheme is utilized to evaluate performance against this indicator where:

- one point will be awarded for each time a proposed solution meets a client need or requirement
- three points will be awarded for a local deployment
- seven points will be awarded for a global deployment

Documentation on a total of 34 points through 12 different deployments and solutions has been submitted to DOE-RL against a target of 38. The specific deployments and solutions are as follows:

1. Wide Area Environmental Monitoring (1 point)
2. Fiber Optic Neutron Detector FLC Award (3 points)
3. Chornobyl Unit 4 Shelter Stabilization (1point)
4. Wide Area Environmental Sampling (1 point)
5. OPSEC Internet Presence Assessment Guide (3 points)
6. RASA Control Software (3 points)
7. International Border Security Training (7 points)
8. Core Conversion Activity targeted at stopping production of weapons-grade plutonium (1point)
9. Soviet-designed Reactors Safety Program (3 points)
10. Nuclear Fuel Technology (1 point)
11. Enhanced Observational Skills Training (7 points)
12. Analysis of bulk environmental samples for IAEA (3 points)

The results from this performance indicator represent a compelling argument that the Laboratory is making significant contributions to resolving National Security problems.

Customer Feedback on Relevance and Excellence in National Security Mission Areas: This performance indicator seeks customer feedback on relevance and excellence of products and services delivered in the National Security mission areas. The results were outstanding for projects within this mission area - the average of **all** project performance questions was over 4.6 on a 1-5 scale, and for those criteria slected by customers as important to them, the average project performance rating was 4.75.

The customer feedback was obtained through the use of a survey. The objective of this year's survey was two-fold:

1) **Maintain a high level of performance.** The survey asks the customer's perception in two areas (strategic value and project performance). This is the third year of surveying customers where the DOE-RL deemed the performance level over the previous two years as at or near "outstanding". This indicator also intends to influence behavior related to achieving higher levels of customer satisfaction.

2) **Demonstrate continuous improvement in the project performance area.** The expectation is– if the variability of the survey responses between projects is reduced, while maintaining a high level of performance, it would represent an improvement in the ratio of customers who were satisfied versus those who are dissatisfied.

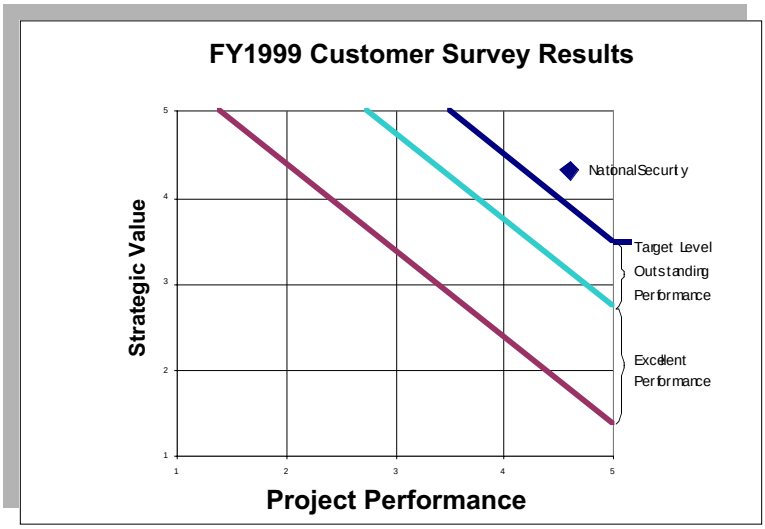


Figure 1.2.7

A survey response rate of 50% was achieved which is down slightly from the overall response rate of 58% last year. Figure 1.2.7 provides the average (mean) of all project results compared to targeted performance levels.

To demonstrate continuous improvement in meeting customers needs in the project performance area (cost, schedule, quality, etc.), the variability of the surveyed responses are compared to the FY1998 results using a standard deviation calculation. Table 1.2.9 provides this comparison:

Table 1.2.9. Standard Deviation of Annual National Security Survey Results.

	Standard Deviation	
Mission Area	FY 1998	FY 1999
National Security	.71	.43

Comparisons between FY1998 and FY1999 show a decline in the variability of the project performance scores indicating the customers' overall perception of project performance does not have as wide a range as last year. (i.e. Customers' responses indicate there is less disparity between customers satisfied with project performance and customers less satisfied with project performance.) Overall, Figure 1.2.7 and Table 1.2.9 suggest that customer perceptions of Laboratory performance for critical projects remains strong in FY1999 and the cluster of projects at that high level are closer to the mean performance.

Number of energy technologies, systems, and technical solutions deployed: This performance indicator focuses on moving energy-related technology to practice and will count the number of energy-related technologies, systems, and technical solutions (software, analytic tools, and methodologies) ultimately deployed.

A critical part of furthering the programmatic and strategic objectives of DOE (ST2-2) is moving technology, systems, and technical solutions from the laboratory to ultimate deployment. The Energy Division successfully made its target of three technology deployments in the area of building energy efficiency while increasing reliability and safety in these areas at the same time. Since these deployments were in Federal and State areas, the public will receive maximum benefit from their utilization. The three deployments are:

1) **Decision Support Operations and Maintenance System (DSOM)** deployed to Fort Campbell, KY. This system is designed to improve the efficiency, reliability, and safety of the buildings and processes. At Fort Campbell DSOM was applied to on-line condition monitoring and automated diagnostics of system performance.

2) **MECcheck Software Toolkit** deployed to public and state programs through International Conference of Building Officials and Building Officials and Code Administrators. This toolkit helps designers, builders, and code officials comply with building code requirements.

3) **COMcheck-EZ Software Toolkit** deployed to public and state programs through International Conference of Building Officials and Building Officials and Code Administrators. More than 200 requests for these materials are received each month. PNNL also maintains a daily hotline that provides support to code users.

Customer Feedback on Relevance and Excellence in Energy Mission Areas*:* This performance indicator seeks customer feedback on relevance and excellence of products and services delivered in the Energy mission areas. The customer feedback was obtained through the use of a survey. The objective of this year's survey was two-fold:

1) **Maintain a high level of performance.** The survey asks the customer's perception in two areas (strategic value and project performance). This is the third year of surveying customers where the DOE-RL deemed the performance level over the previous two years as at or near "outstanding". This indicator also intends to influence behavior related to achieving higher levels of customer satisfaction.

2) **Demonstrate continuous improvement in the project performance area.** The expectation is that if the variability of the survey responses between projects is reduced, while maintaining a high level of performance, it would represent an improvement in the ratio of customers who were satisfied versus those who are dissatisfied.

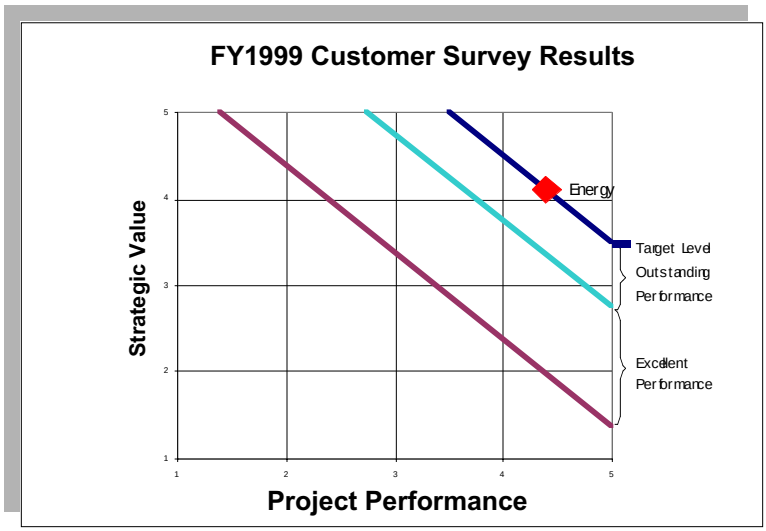
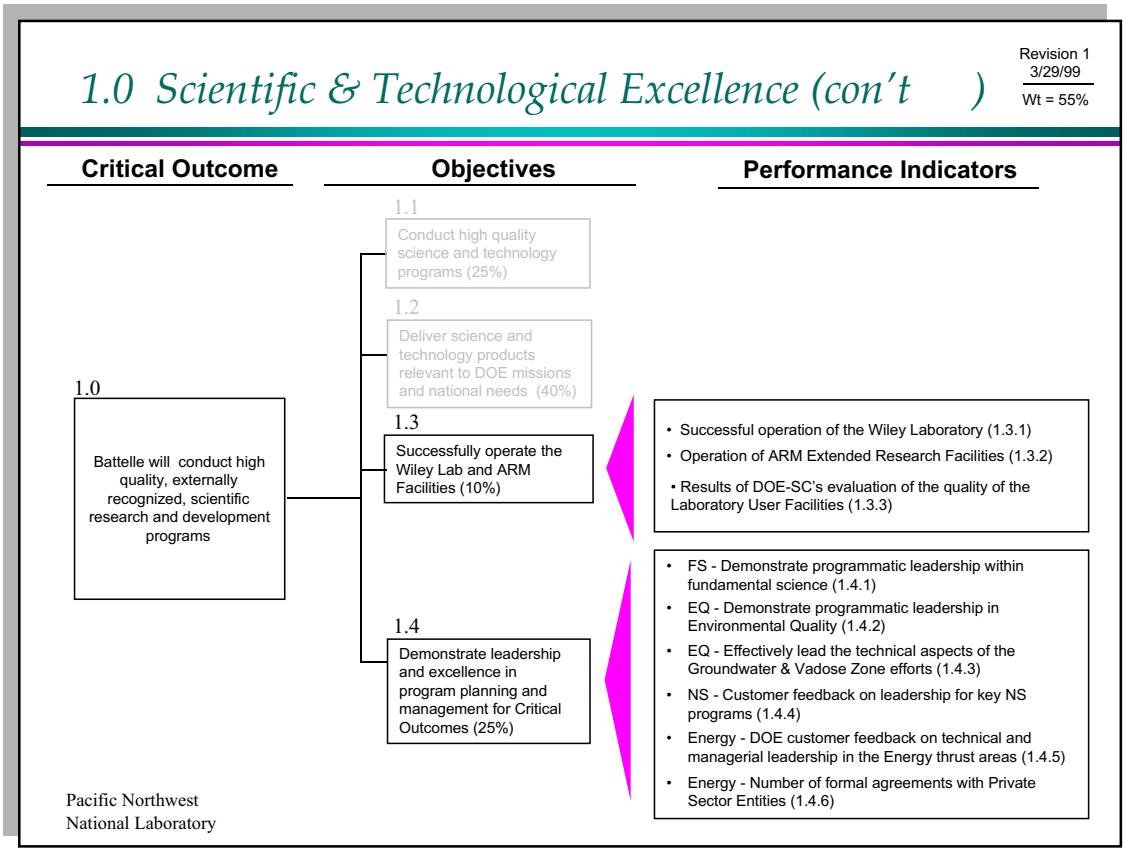


Figure 1.2.11

A survey response rate of 50% was achieved which is down slightly from the overall response rate of 58% last year. Figure 1.2.11 provides the average (mean) of all project results compared to targeted performance levels.

Overall, Figure 1.2.11 suggests that customer perceptions of Laboratory performance on critical projects and the strategic value provided to the client is at a superior performance level for FY 1999.

Objective 1.3: Successfully operate the Wiley Lab and ARM Extended Research Facilities.



Results

Productivity, in terms of publications, and user satisfaction provide highly relevant data to enable our understanding of the contributions made by those user, or extended research, facilities entrusted to us. In the specific case of EMSL, the growth in the number and breadth of users is also of paramount concern. Results indicate that we are providing a facility that is of service to mankind. EMSL continues to grow its user base, both in number and type of User. Additionally, EMSL's users value the resources and capabilities provided. EMSL's productivity, at least that which is within our control to capture, indicates that scientists are impacting the nation at increasing levels. We expect those levels to continue to increase over the long-term.

The effectiveness of ARM is also manifest in its productivity and user satisfaction results. ARM is sustaining increasing publication rates that continue to exceed our expectations. Additionally, the Science Team ranks the services and products provided highly.

As ascertained from peer review comments, these two facilities are well managed and can have strong and enduring impacts on the nation's scientific agenda. In many respects, our results speak to how we are already performing. We clearly have two national assets that we must continue to nurture and grow.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Outstanding.**

Analysis

Successfully operate the Wiley Lab and ARM Facilties: This Objective is supported by three performance indicators; Operation of the EMSL and ARM Research Facilities, and the DOE-SC Evaluation of the Quality of our User Facilities. The EMSL and ARM performance indictors are further supported by several sub-indicators, as follows.

Number of Users of the Wiley Lab (Environmental Molecular Sciences Laboratory (EMSL): For EMSL to be successful it must attract users that reflect the broad and diverse user base necessary to contribute to the Nation's Science Agenda. EMSL must demonstrate that it is relevant and impactful to the nation's most pressing problems and that it is valued by the scientific community in that context. An increase in the breadth and depth of our users truly speaks to our sustainability. FY1999 results indicate that we are in fact providing a relevant and impactful facility to the nation. The number of EMSL users has grown to 820 in FY1999 compared to our target of 823. Figure 1.3.1 shows that this number represents a broad spectrum of participants, with the academic community at its forefront.

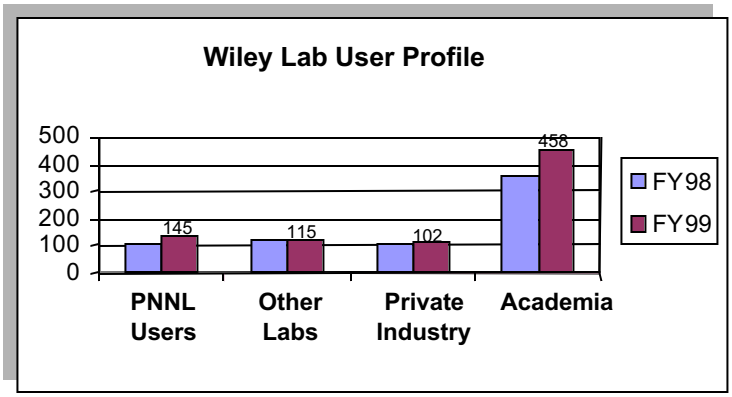


Figure 1.3.1

The number of peer-reviewed publications from use of the Wiley Lab (EMSL) by non-EMSL staff: Another indicator of relevance and impact of the EMSL is the number of publications that are produced using the EMSL, by non-EMSL staff . Capturing this data has proven to be a significant challenge since much of the user community's productivity resulting from use of EMSL is beyond our control. We believe, however, that we have made a valiant effort in pursuing these results. The results obtained to date indicate that we have exceeded our target for EMSL publication productivity. Non-EMSL staff published 38 publications in FY1999, see Figure 1.3.2. All of these publications included co-authors within EMSL.

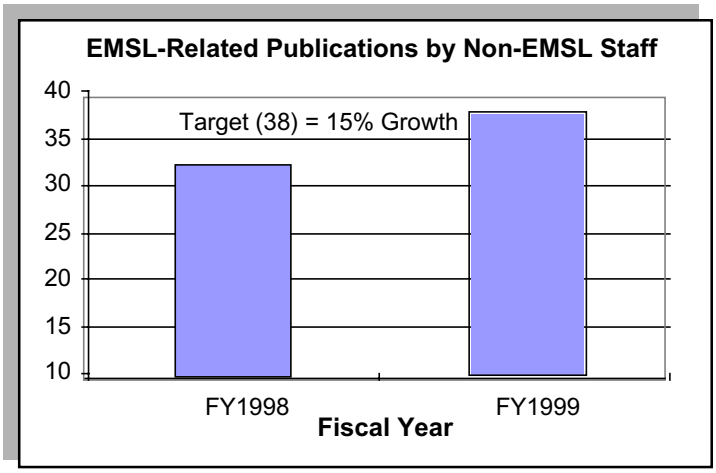


Figure 1.3.2

ESML User Satisfaction: One of the key measures of EMSL's contribution and relevancy to the scientific community is ascertained through the use of a user satisfaction survey. This survey helps us to understand our effectiveness at meeting the needs of researchers, and it helps us understand our impact. Finally, this survey helps us identify areas where we can improve. Results collected to date indicate that we are performing at the outstanding level. This is evidenced by the strong and highly positive responses we have

received to our survey. In fact, the feedback we receive indicates that greater support by EMSL staff, as well as enhanced instrumentation would be most relevant. On the one hand, this tells us that we are doing everything right, on the other hand, it indicates that the broader user community requires more. The challenge will be to maintain budgets commensurate with the needs of the broader research community in the future. Responses across several key questions are presented below:

- Survey results indicate a response rate of 24.5%.
- Results are very positive:
  - 83% of users are satisfied or very satisfied with the way the EMSL environment facilitated scientific accomplishment.

    Very Satisfied: 51%

    Satisfied: 32%
  - 76% of users were satisfied or very satisfied with the availability of the existing facilities and equipment.

    Very Satisfied: 44%

    Satisfied: 32%
  - 73% of users were satisfied or very satisfied with performance (e.g., were facilities and equipment maintained to appropriate specifications for your intended use)?

    Very Satisfied: 47%

    Satisfied: 26%
  - 86% of users were satisfied or very satisfied with the support provided by the EMSL staff?

    Very Satisfied: 54%

    Satisfied: 32%

Number of peer-reviewed publications based on ARM data: Like EMSL, one of the ARM Program's ultimate measures of productivity is through the publications of its science team. Here again we witness our impact through our contributions to the greater body of knowledge, in global climatic change, through our publication productivity. In FY1999 we achieved a publication rate of 123 which surpassed our expectation of 119 or 10% growth. Figure 1.3.3 provides a comparison of the growth of ARM-related publications.

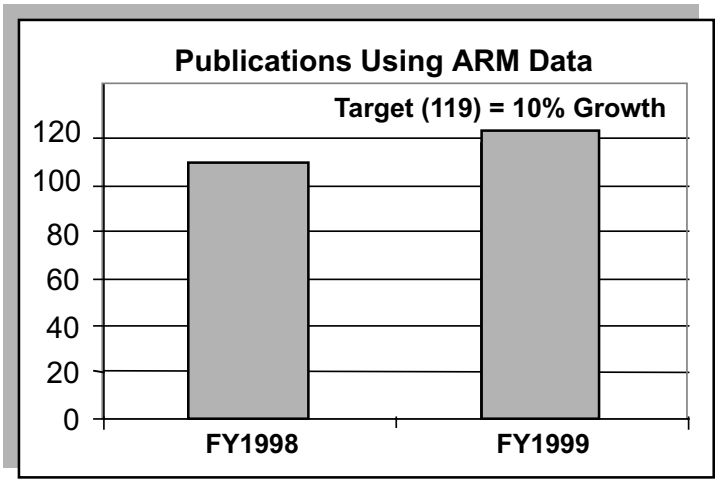


Figure 1.3.3

User Satisfaction: As with EMSL, user satisfaction is designed to measure our impact and relevancy to our user community; that of the ARM Science Team. Our ability to provide new knowledge to the user community is a cornerstone of who we are and reflects upon our ability to impact meaningful change that spans the international scientific community. Our results indicate that we are performing at the outstanding

level. We are clearly providing valuable information to the scientific community in ways that support the development of global climate change policy. This is evidenced by:

- Forty surveys were issued, seventeen were returned (42% return rate)
- Responses were very positive:
  - 100% of the respondents were either satisfied or very satisfied with the support they received from the ARM Experiment Center.

    71% very satisfied

    29% satisfied
  - 94% of the respondents were either satisfied or very satisfied with the data and data products provided by the Center.

    53% very satisfied

    41% satisfied

Results of DOE-SC evaluation of the quality of Laboratory User Facilities: The results from the annual DOE-SC evaluation will not be available until December 1999 and hence, no definitive performance level can be provided. However, Battelle's position on the expected performance level of this indicator is that a continuation of previous year's performance levels will be sustained. The performance level offered to the Laboratory from the Office of Science has consistently been at the Outstanding level and Battelle's view is that there is no evidence to expect other than that same rating for FY 1999. Figure 1.3.4 provides the historical perspective for this assertion.

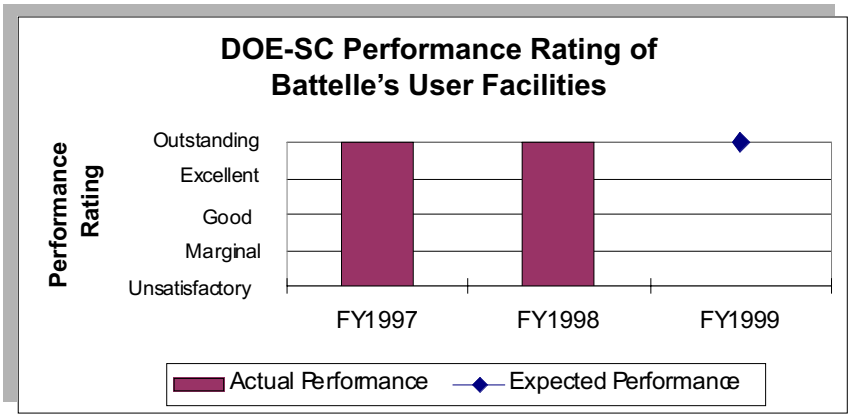


Figure 1.3.4

Objective 1.4: Demonstrate leadership and excellence in program planning and management for Critical Outcomes.

Results

To be recognized as demonstrating true, effective, and high quality leadership is one of the hallmarks of an organization's strength and depth of character. Leadership relies heavily on the ability to look outward. To listen carefully, dissect intently, and develop strategies that can respond to the most pressing needs of the customer is fundamental.

Personal interviews with key programmatic customers formed the basis for Battelle's assessment of our progress toward meeting this Objective. These interviews provided DOE and Battelle an opportunity to rate the quality, technical and managerial leadership in each of the four DOE mission areas. The outcome of these interviews reflects extreme confidence by the customer upon the quality of our leadership, our ability to team with others, and the technical contributions provided to

programmatic areas. In effect, our customers asked us to keep doing well what we have been doing. Concerns were expressed regarding leadership changes and the ability of Battelle to prepare new leaders.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Outstanding.**

Analysis

Demonstrate programmatic leadership within Fundamental Science: Our ability to provide leadership in fundamental science was judged via feedback provided by the Director of the Office of Science (SC), Ari Patrinos of the Office of Biological and Environmental Research (OBER).

A joint interview conducted by Gerry Stokes and Debbie Trader, in conjunction with the Director of OBER was conducted and focused around four key dimensions of leadership:

- The quality of our leadership,
- Our ability to effectively team with other laboratories and universities,
- The degree of Laboratory Institutional support provided, and
- Overall program quality.

Our interview with the Director of OBER focused around our leadership over four important programs:

- Atmospheric Radiation Measurement (ARM),
- Accelerated Climate Prediction (ACPI),
- Environmental Molecular Sciences Laboratory (EMSL), and
- Natural and Accelerated Bioremediation Research.

Table 1.4.1.

Leadership Dimension	Weighting	Rating				Weighted Score
		ARM	ACPI	EMSL	NABIR	
How would you rate the quality of leadership provided by PNNL?	40%	5	5	5	5	2
How would you rate PNNL's ability to effectively team with other laboratories and universities?	20%	4	4	4	4	0.8
How would you rate the degree of Laboratory institutional support to leadership of these programs?	20%	5	5	5	5	1
How would you rate the overall program quality?	20%	5	5	5	5	1
Final Rating						**4.8**

Overall, our rating was outstanding with 3 out of 4 dimensions of leadership being rated out the outstanding level, resulting in a final score of 4.8. Our rating reflects a deep understanding and responsiveness to the needs of our primary customer. We were rated at the "4" (or excellent) level for our teaming abilities however, our sponsor stated that we are "possibly the best at it". We need to keep doing what we have been doing as our leadership is valued by our customer. We also need to ensure that Institutional support is maintained as the new Laboratory Director is brought on.

Demonstrate programmatic leadership in Environmental Quality: This performance indicator is designed to provide a feedback mechanism regarding Battelle's ability to demonstrate strong and effective leadership to the initiatives we manage. A program composite was developed based upon interviews with those responsible for program oversight and direction. The interviews were conducted jointly by representatives from the research division and DOE-RL. Leadership is assessed along four dimensions:

1. Rating of the *quality* of leadership provided by Battelle.
2. Rating of Battelle's ability to *effectively team with other laboratories and universities*.
3. Rating of the degree of *Laboratory institutional support* to the leadership of these programs.
4. Rating of the *overall program quality*.

A final rating along each dimension was evaluated on a 1 to 5 scale with 5 representing outstanding performance.

Battelle's leadership of four programs and their associated rating is as follows:

- **Tanks Focus Area**: Excellent to outstanding performance in all areas.
  - Future should focus on strengthening the integration of the basic sciences and bringing more strategic balance back in the investment portfolio.
- **National Stewardship Agenda**: Program still in formative stages. No major players with PNNL as good as any and best in some areas.
  - Concerned that PNNL is not strongly enough committed to cleanup mission.
- **Center for Risk Excellence**: Key member of core team with ORNL, ANL, BNL and Sandia. PNNL's outstanding performance on key products (both timeliness and quality) has defined the standard that other labs struggled to replicate.
  - Client concerned they may only be tapping a relatively small subset of PNNL.
- **Support to Hanford Cleanup**: Project performance, partnering and relationship with RL is excellent.
  - Needed a much bolder response to emerging opportunities at Hanford.
  - Senior management support and commitment to Hanford cleanup opportunities was noticeably weaker.
  - Concerned about apparent shortage of next generation leadership

The overall composite rating for programmatic leadership in environmental quality is a 4.0 verses a target level of 5.0. This composite rating represents excellent performance as acknowledged by our key customers and validated by DOE-RL. The primary opportunity for improvement identified through the interviews was to strengthen the Laboratory institutional support.

Effectively lead the technical aspects of the Groundwater and Vadose Zone Integration Project: There are two technical areas that support this performance indicator. The DOE Integration Project team will use a point system to evaluate the Laboratory's overall performance. Point values will be given for meeting quality, schedule and cost requirements in the following areas:

- Battelle's leadership in the Integration Project for bringing science and technology to bear on key issues and gaps in knowledge, understanding, scientific data, and tools. The management structure for identifying and implementing science and technology will be the S&T Roadmap.

- Battelle's technical leadership in the development and implementation of a System Assessment Capability.

While a final rating from DOE has not been determined as of the print date of this document, all S&T Roadmap and System Assessment Capability activities were completed satisfactorily, earning full point values. Battelle believes that the final rating will be excellent-to-outstanding.

Customer feedback on leadership for key National Security programs: This performance indicator is designed to provide a feedback mechanism regarding Battelle's ability to provide leadership and key technical contributions to the DOE national security strategic goals. A composite score was developed based upon equal waiting of the interviews with key DOE customers in three programmatic areas. The interviews were by the Associate Laboratory Director for the Natinal Security Division and the DOE-RL Director of Science and Technology Programs Division.

A final rating was determined at the conclusion of each interview and scored on a 1 to 5 scale with 5 representing outstanding performance. The final averaged score for the three interviews is 4.7.

Battelle's leadership of three programs and their associated rating is as follows:

- Non-Proliferation/Arms Control:
  – "PNNL is the best Lab."
  – "Their leadership is the best. If I could give all my money to PNNL, I would."
- Office of Counter-Intelligence:
  – "I've entrusted PNNL with my two largest programs."
- Office of Intelligence:
  – "PNNL provides the best people to work with the Secretarial leadership on Intelligence matters."

The overall composite rating for programmatic leadership in national security is a 4.7 verses a target level of 5.0. This composite rating represents superior performance as acknowledged by our key customers and validated by DOE-RL.

DOE customer feedback on technical and managerial leadership in the Energy thrust areas: This performance indicator is designed to provide a feedback mechanism regarding Battelle's ability to provide technical and managerial leadership in four Energy thrust areas. A composite score will be developed based upon interviews with key DOE customers in programmatic areas. The interviews will be conducted jointly by representatives from the research division and DOE-RL.

A final rating was determined at the conclusion of each interview and scored on a 1 to 5 scale with 5 representing outstanding performance.

Battelle's leadership of four thrust areas and their associated rating is as follows:

- Energy Efficiency and Renewable Energy: **Excellent**
  – Outstanding international efforts.
  – Improve PNNL recognition for distinctive capabilities in support of EERE mission areas.

- Light Weight Materials and Advanced Simulation OTT: **Excellent – Outstanding**

  Outstanding accomplishment through NATT in lightweight materials resulting in innovative heavy truck manufacturing.
  - Expand NATT to include emission controls.
  - Develop Engineering Simulation Initiative.

- Intelligent Buildings and Building Standards: **Excellent – Outstanding**
  - Maintain building standards technical expertise.
  - Develop with industry, respond to emerging roadmap for Intelligent Buildings Program.

- Advanced Fuel Cell Systems: **Outstanding**
  - Build public-private support for new generation fuel cells

The overall composite rating for programmatic leadership in the Energy thrust areas is a 4.5 verses a target level of 5.0. This composite rating represents superior performance as acknowledged by our key customers and validated by DOE-RL. The primary opportunity for improvement identified through the interviews was for Battelle to not only maintain the current level of technical leadership but help the programmatic areas become successful.

Number of formal agreements (e.g., CRADAs, MOUs, non-government contracts, and other formal agreements and expressions of interest) established during FY1999 with private sector entities: This performance indicator focused on gaining formal agreements with non-government contracts in at least one of the four DOE thrust areas of: Efficient Vehicles and Automotive Structures, Intelligent Building Systems, Engineering Simulation and Modeling-Virtual Prototyping, and Fuel Systems Technology. The Energy Division successfully formed eight of the nine target agreements affecting all four of the desired thrust areas.

Eight (8) formal agreements (CRADAs, MOUs or 1831 Agreements) were achieved in FY99 vs. our target of nine (9). The following represent the type and number of agreements meeting the criteria for this indicator:

CRADAs Completed:

1) Plasma Assisted Catalysis for Heavy-Duty Diesel Engines – Caterpillar
2) Quantifying the Environmental Effects on the Mechanical Properties of Advanced Silicon Nitride Materials for Diesel Engine Applications — Caterpillar
3) Advanced Computational Modeling for Deformation of Aluminum Alloys – ALCOA & MARC
4) Direct Casting of Titanium Alloy Wire for Low-Cost Aerospace and Automotive Fasteners – Dynamet Incorporated
5) Ultrasonic Backscatter Sensor R&D for Characterization of Induction Hardened Steel Parts – Sonix, Inc.

MOUs Completed:

1) Program on Solid Oxide Fuel Cells – Federal Energy Technology Center (FETC)

1831 Agreements:

1) Fuel Cell Reformer – Proprietary Company
2) Non-Thermal Plasma Exhaust After-treatment – Proprietary Company

Results indicate that we are performing at an outstanding level with regard to our leadership and management of programs critical to our key customers.

Scientific and Technological Excellence Performance Evaluation

The overall performance rating for this Critical Outcome is determined by comparing the total value in the following tables to the rating scale at the bottom.

Table 1.1. Objective 1.1 Performance Rating Development

Element	Performance Level	Effective Score	Value Points	Weight	Weighted Points
1.1 Conduct high quality S&T programs					
1.1.1 Results of external peer review of relevance and excellence, including Divisional reviews	Outstanding	40			
1.1.2 Recognition by the external scientific and technical community	194 (>10% growth)	20			
1.1.3 Number of R&D 100 and FLC awards	Rolling Ave. is 8.3	10			
1.1.4 Publication Growth	19% growth	20			
1.1.5 Number of quality academic /scientific partnerships	94	10			
	Total from Curves	100	5	50%	2.5
1.1.6 Results of DOE-SC Evaluation of the quality of science	Outstanding	NA	5	50%	2.5
	Obj 1.1 Total				5.0

Table 1.2. Objective 1.2 Performance Rating Development

Element	Performance Level	Effective Score	Value Points	Weight	Weighted Points
1.2 Deliver S&T products relevant to DOE missions and national needs					
1.2.1 Results of DOE-SC evaluation of the relevance of Battelle work to DOE Missions and Needs			5.0	10%	0.5
1.2.2 The results of DOE-SC evaluation of the Laboratory's programmatic performance			4.0	10%	0.4
1.2.3 Effectively lead the technical aspects of the national Tanks Focus Area	200	61			
1.2.4 Effectively support the Hanford Tanks Privatization Effort	222	67			
1.2.5 Number of innovative technologies and approaches successfully deployed in commercial practice	19	60			
1.2.6 Provide significant solutions to Hanford problems/needs	62.5	55			
1.2.7 Customer Feedback on relevance and excellence in Environmental Quality Mission Areas	8.3	28			
1.2.8 Number of solutions and deployments to significant national security problems/issues	34	94			
1.2.9 Customer Feedback on relevance and excellence in National Security Mission Areas	8.9	50			
1.2.10 Number of energy technologies, systems and technical solutions deployed	3	100			
1.2.11 Customer Feedback on relevance and excellence in Energy Mission Areas	8.5	50			
	Total from Curves	574	4.8	80%	3.8
				Obj 1.2 Total	4.7

Table 1.3. Objective 1.3, Indicators 1.3.1 and 1.3.2 Performance Rating Development

Element	Performance Level	Effectiveness Score
1.3.1 Successful Operation of Wiley Laboratory		
1.3.1.1 Number of users of the Wiley Laboratory	820	100
1.3.1.2 Number of peer-reviewed publications from use of the Wiley Lab by non-PNNL staff.	38	100
1.3.1.3 User satisfaction	83%	100
	1.0 Total to 1.3.1	300
1.3.2 Operation of Atmospheric Radiation Measurement Extended Research Facilities		
1.3.2.1 Number of peer-reviewed publications based on ARM data.	123	100
1.3.2.2 User satisfaction	100%	100
	2.0 Total to 1.3.2	200

Table 1.4. Objective 1.3 Performance Rating Development

Element	Performance Level	Effective Score	Value Points	Weight	Weighted Points
1.3 Successfully operate the Wiley Lab and ARM Facilities					
1.3.1 Successful operation of the Wiley Laboratory	300	60			
1.3.2 Operation of ARM Extended Research Facilities	200	40			
	Total from Curves	100	5.0	50%	2.5
1.3.3 Results of DOE-SC evaluation of the quality of the Laboratory's User Facilities			5.0	50%	2.5
	Obj 1.3 Total				5.0

Table 1.5. Scientific and Technological Excellence Critical Outcome Performance Rating Development

Element	Performance Level	Effective Score	Value Points	Weight	Weighted Points
1. Scientific and Technological Excellence					
1.1 Conduct high quality S&T programs	Obj 1.1 Total		5.0	25%	1.3
1.2 Deliver S&T products relevant to DOE missions and national needs	Obj 1.2 Total		4.7	40%	1.9
1.3 Successfully operate the Wiley Lab and ARM Facilities	Obj 1.3 Total		5.0	10%	0.5
1.4 Demonstrate leadership & excellence in program planning & management …					
1.4.1 Demonstrate programmatic leadership within Fundamental Science	4.8	95			
1.4.2 Demonstrate programmatic leadership in Environmental Quality	4.0	50			
1.4.3 Effectively lead the technical aspects of the Groundwater and Vadose Zone efforts	Excellent - Outstanding	35			
1.4.4 Customer Feedback on Leadership for key National Security Programs	4.7	62			
1.4.5 DOE customer feedback on technical and managerial leadership in the Energy thrust areas	4.5	19			
1.4.6 Number of formal agreements… with private sector entities	8	35			
	Obj 1.4 Total	296	4.5	25%	1.1
				Total	4.8

Table 1.6. Scientific and Technological Excellence Critical Outcome Final Rating

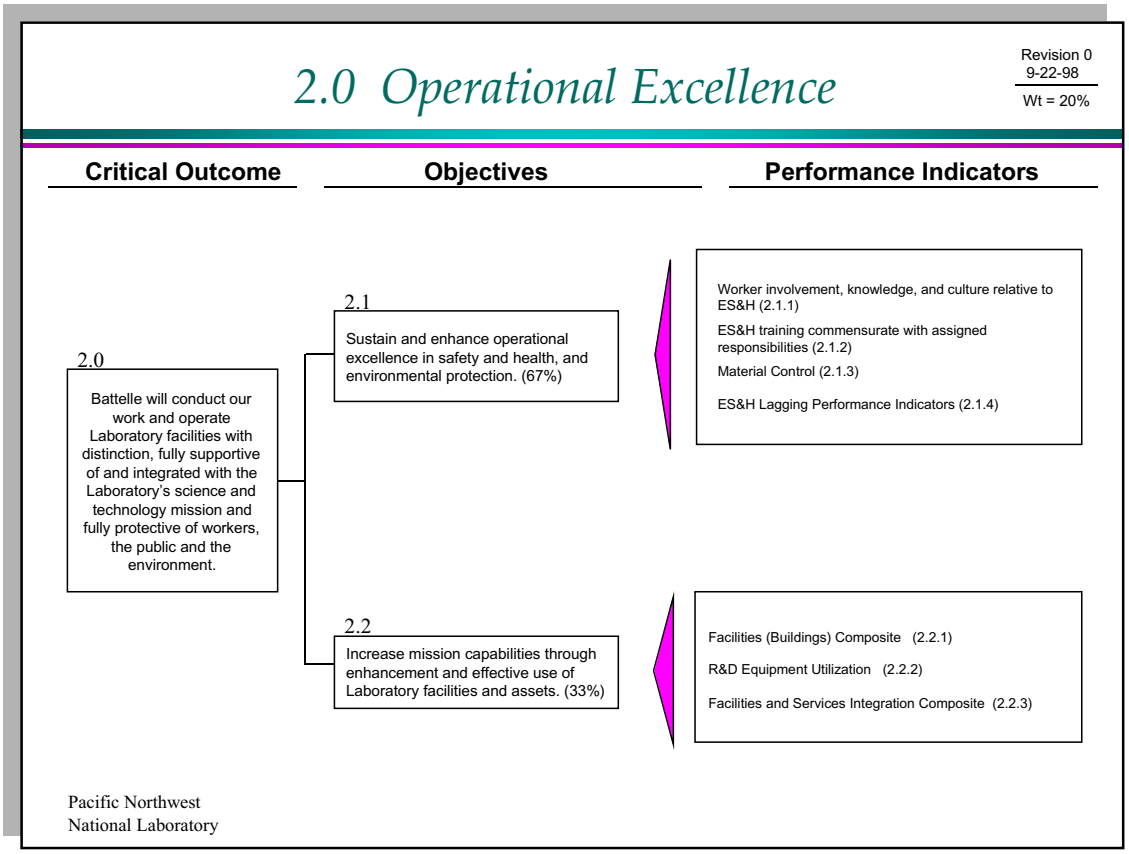
Total Score	5.0 - 4.5	4.4 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 1.0
Final Rating	**Outstanding**	Excellent	Good	Marginal	Unsatisfactory

2.0 Operational Excellence

The Department of Energy's Strategic Plan communicates a strong and very unambiguous commitment to operations to ensure the health and safety of our work force and the public, and the protection of the environment.

The Laboratory recognizes that strong scientific and technical performance can not be accomplished at the expense of ES&H or operational performance. In fact, strong ES&H and operational performance is seen as an enabler of the execution of the Laboratory's mission related work. For these reasons, and in partnership with the DOE, the Laboratory has established the Operational Excellence Critical Outcomes and its supporting Objectives to guide our improvement efforts and performance indicators to monitor our progress toward our goals.

The Operational Excellence Critical Outcome Tree, detailing the Critical Outcome and its' supporting Objectives and Performance Indicators, is presented below.



Summary

The Laboratory continues to conduct work and operate facilities with distinction and in a manner that is supportive of the Laboratory's science and technology mission. We have made significant investments over the past six years to integrate sound safety and environmental management practices into daily operations. Staff and managers are taking responsibility for their ES&H related performance: more staff are involved in the planning and safe execution of work than ever before; more than 99% of staff are current on their training, and staff are conscious of the work controls that affect their work. In addition, improvements in awareness and attention to ES&H issues have also been reported as a result of increased staff involvement in work planning activities.

The Laboratory's performance with respect to occupational safety and health, radiological control, waste management, and environmental protection are strong. We have made quantitative improvements in most of the nine lagging indicators we monitor monthly although a couple, most notably in the area of radiation contaminations, have presented us with opportunities to improve. A comparative analysis of OSHA statistics indicated that PNNL's performance is better than the average for other R&D organizations and is improving at a faster rate. Staff continue to perform very well with respect to the OSHA indicators for lost work case rate, recordable case rate, and lost work days. In addition, no events were recorded related to the transportation of hazardous materials or the loss of radioactive sources. Additional attention will be needed to reduce the number of skin and personal clothing contamination events however.

The Laboratory's waste management and environmental protection performance is meeting or exceeding expectations. Chemical "slop jars" achieved a 98% acceptance rate at waste operations, meeting our FY1999 target. Material control assessments however, while surpassing the FY1998 score of 84.3% with a new high of 90.4%, indicate that our systematic approach to managing these hazards requires improvement. This will be an area of focus in FY2000.

The Laboratory has demonstrated strong performance relative to the management and use of facilities and assets. Processes used for acquiring, modifying, and utilizing facility assets are effective. Office space allocations are on par with national benchmarks, finishing at 134 square feet per staff member, while our "churn rate," a measure of the frequency of internal movement of staff, at 20.9%, is significantly below national and R&D standards of nearly 50%. We believe this is due, however, in large part to the lack of offices for staff movement.

We have also pursued benchmarking opportunities aggressively in FY1999, using data as the basis to make improvements. Of specific note is the reduction of more than $1.5M in space cost savings due to the lessons learned as a result of our benchmarking activities. Finally, increased attention and interaction with the Hanford Site Integration Group is beginning to yield positive results as PNNL staff provide significant input to the Group in order to reduce disconnects between site contractors. As part of the Site Integration Group, we submitted a cost reduction proposal for a Waste Identification System that reduced PNNL costs by approximately $1M in FY1999. Other Hanford Contractors have since adopted the process and could save significantly more than $1M each in FY2000. In addition, the increased sensitivity we have created to the integration of site services among the Hanford Contractors resulted in the development of an integrated working group to review eleven site services in FY200 for possible cost reallocation or privatization.

Based on the evidence provided in this self-evaluation, our overall performance rating on this critical outcome is **Outstanding**.

Objective 2.1: Sustain and enhance operational excellence in safety, health and environmental protection.

Results

In FY1999, the Laboratory focused on, three key aspects of ensuring operational excellence in ES&H; worker involvement, training commensurate with responsibilities, and material control. Additionally a set of "Lagging Indicators" were utilized to ensure that previously attained high levels of overall performance were maintained.

In addition to verifying overall operational excellence, the assessments related to this objective indicated that improvement needs to be made in the areas of protecting staff on foreign travel and involving staff in developing the work procedures. Also, although our ability to manage chemicals and chemical wastes are showing significant improvement, these will continue to be areas of focus for the Laboratory in FY2000.

Of specific note is the continual general decline in the Lost Workday Case Rate over the past five years with dramatic improvement over the past year. In FY1999, we reduced the Lost Workday Case Rate to 0.6 cases per 100 staff members. This represents a level less than half our FY1999 target of less than 1.2 cases per 100 staff and is significantly below the DOE 1998 Research Contractor Average Lost Workday Case Rate.

Our performance toward this Objective demonstrates the Laboratory's continuing ability to drive improvement in targeted areas while sustaining and even enhancing performance as a whole.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Outstanding.**

Analysis

Worker involvement, knowledge, and culture relative to ES&H*:* To ensure worker involvement in work planning, and an appropriate level of worker knowledge and culture relative to ES&H, management committed to conduct a minimum of 175 assessments of ES&H culture during FY1999. A total of 216 evaluations were conducted. The results of the assessments indicated that staff are engaged in the ES&H program and take ownership of safety. Interestingly, the issue of Foreign Travel Safety was raised as a significant issue during the assessments and will be tracked to resolution.

Dose Index: The FY1999 Dose Index of 0.16, compared with the target of < 0.20, indicates that the levels of interaction between Project Managers and Radiological Engineers in planning and executing work being conducted on the Site is increasing. This is a significantly positive indication that Radiological Engineers are developing a better understanding of work activities and job scope, while work planners are developing a better understanding of radiological ALARA practices.

User Involvement in SBMS Subject Area Involvement: The Standards-Based Management System (SBMS) is the repository for all Laboratory-level procedures, policies, guidelines and requirements. 55% of the SBMS Subject Areas developed in FY1999 were developed with user involvement. This rate is vastly improved over last year's 30% involvement but we believe there is still room for improvement. The improvement is necessary to ensure that the most up-to-date information is

contained in SBMS. The need to continuously increase the degree of User involvement in developing and maintaining SBMS Subject Areas has resulted in a proposed modification to the process for developing and revising the Subject Areas.

ES&H Training Commensurate with Assigned Responsibilities: For the second year in a row, this indicator demonstrates the Laboratory's ability to plan training and to execute the training plans. Training staff to a level commensurate with their responsibilities is one of the guiding principles of DOE's corporate program to ensure operational excellence, Integrated Safety Management. In FY1999, 95.6% of staff completed training plans for the duties they perform. This composite has exceeded the target of 85% and is a significant indication of the safety awareness of PNNL staff. Additionally, staff completed 99.1% of their required ES&H training courses, exceeding the 90% target by a significant margin.

Material Control: The two sub-indicators that comprise the material control performance indicator provide measures of the Laboratory's ability to implement one of the core functions of DOE's Integrated Safety Management Program, management of hazards. The first of the two sub-indicators measures the accuracy of the data provided by the Laboratory's Chemical Management System. The score of 90.4% represents substantial improvement over the FY1998 score of 84.3% and significant progress toward the FY1999 target of 95%. We intend to maintain this indicator as a measure of effectiveness of the ongoing improvements to chemical management.

The second of the two sub-indicators that support this indicator measures the percentage of hazardous waste "slop jars," a specific type of satellite accumulation area (SAA) waste, that pass content verification inspections when they are received by the waste operations staff.

During FY1999, staff waste generators achieved a 98% acceptance rate of "slop jars." Our focus in FY2000 will be on improving the communication of requirements to the generators along with the tools and services provided to support their work.

Performance in the material control areas, combined with performance against the ES&H "Lagging Indicators," demonstrates the Lab's ability to manage hazards in a manner that protects workers, the public, and the environment. Other material control assessments however, indicate that our systematic approach to managing these hazards needs improvement. These areas will continue to be areas of focus in FY2000.

ES&H Lagging Performance Indicators: In addition to monitoring the status of the ES&H performance indicators listed above, we also monitor a series of Lagging Indicators, so called because they report data after the fact, as opposed to in-process. The composite of these indicators provides an overall indication of the health of the Laboratory's Environment, Safety and Health program. The composite score for the lagging indicators, which is most sensitive to Lost Workday Cases, Unplanned Doses, and Environmental Protection; indicates that the Laboratory is sustaining excellence in the protection of workers, the public, and the environment. Specifically, the data indicate that events related to worker injuries and lost workdays are dramatically improved over previous years, and that incidents involving radiation exposures need additional attention. It must be remembered however, that is some cases, the data appear to be reflections of random acts and are not the result of a system or process breakdown.

Of specific note is the fact that PNNL staff attention to safety training and awareness has led to a continual general decline in the Lost Workday Case Rate over the past five years with dramatic improvement over the past year. Table 2.1 indicates that *in FY1999,* we reduced the Lost Workday

Case Rate to 0.6 cases per 100 staff members. This represents a level less than half our FY1999 target of less than 1.2 cases per 100 staff and is significantly below the DOE 1998 Research Contractor Average Lost Workday Case Rate.

Table 2.1. Performance of FY1999 ES&H Lagging Indicators Against Target.

Sub-Indicator	FY1999 Performance	FY1999 Target
OSHA Lost Workday Case Rate	0.6 Cases/ 100 Staff	≤1.2
OSHA Recordable Case Rate	1.7 Cases/100 Staff	≤2.3
OSHA Lost Workday Rate	10.4 Lost Workdays/100 Staff	≤20
Unplanned Doses	0 Events	= 0
Spread of Radioactive Contamination	3 Event	< 2
Loss of Radioactive Sources	0 Losses	= 0
Skin/Personal Clothing Contaminations	12 Events	≤ 5
Environmental Protection	2 Events	≤ 1
Transport of DOE Hazardous Material	0 Events	≤ 2

Objective 2.2: Increase mission capabilities through enhancement and effective use of Laboratory facilities and assets.

Results

This objective has driven the Laboratory to expand its understanding of the business of facilities, space and equipment operations. We finished the year with Total average office space at 134.3 square feet per staff member. While this total fell short of our target, the fact that it fluctuated very little over the course of the year indicates that it is relatively stable. Our churn rate for FY1999 finished the year at 20.9% against our target of less than 50%. This constitutes exceptional performance, but it is not entirely by design. When considered in light of the comment above that the Laboratory's current space portfolio is of limited flexibility, we concluded that this value is artificially low, in part, due to the lack of office space for staff movement.

As a result of our benchmarking efforts the Laboratory decreased its overall cost per gross square foot of space from $18.51 to $17.77 for a net decrease of 4% against our target of 5%. The $0.74 decrease per gross square foot, amortized over the current 2,040,000 square feet of the Laboratory, yields a cost savings of $1.509M.

The FY1999 Facilities Issues Customer Satisfaction survey showed 2% improvement over the FY1998 survey but fell short of our 4% target. In some areas of the survey however, customer satisfaction increased as much as 13%.

We finished the year collecting 239 of the individual R&D equipment data points needed against our target of 256 proving that this type of information can be collected. The real lesson from this indicator however, was in the knowledge that a piece of equipment existed on site, and not in the fact that it had available capacity.

We finished the year with strong performance in three of the four Facilities and Services Integration Composite sub-indicators. We participated in the Hanford Site Integration Group (SIG). As part of this group, we are trying to establish a long-term transition plan for Hanford Site Services, predominately in the 300 Area, in order to avoid an interrupted transition when the PHMC completes its clean-up work. Facilities staff updated 79% of the Building Life Cycle Plans. These plans are critical to management's understanding of where to invest critical long-term and short-term resources to ensure that the Laboratory has adequate facilities to support future science missions. As part of Hanford Site Integration Group, we submitted a cost reduction proposal for a Waste Identification System that reduced PNNL costs by approximately $1M in FY1999. Other Hanford Contractors have since adopted the process and could save significantly more than $1M each in FY2000. In addition, the increased sensitivity we have created to the integration of site services among the Hanford Contractors resulted in the development of an integrated working group to review eleven site services in FY200 for possible cost reallocation or privatization. Finally, developed a process to ensure that all network infrastructure projects are managed consistent with other PNNL projects. In this way, we were able to complete four projects over the past fiscal year and at less cost than in previous years when we could only complete three.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Excellent**.

Analysis

Facilities (building) Composite: This composite is composed of three sub-indicators that, together, provide management with an indication of how well the Laboratory's processes for space utilization are supporting the science and technology mission of DOE and Battelle. The three sub-indicators are Total Office Space per Staff Member, Staff Churn Rate, and Continuous Improvement in F&O Operations Realized from Benchmarking.

Total Average Office Space per Staff Member: Total average office space finished FY1999 at 134.3 square feet per staff member, see Figure 2.2.1. While this total fell short of our target, the fact that it fluctuated very little over the course of the year indicates that it is relatively stable. In point of fact, this metric has fluctuated little since our FY1998 average measurement of 133 square feet per staff member. We did discover however, that this indicator is really of little utility to the Laboratory. It was intended to raise an awareness of how each organization was loading its office space. Instead, we discovered that with our current space portfolio, the physical arrangement of fixed walled offices, there is little or no free space to move staff to. This same phenomenon impacts the Churn Rate metric following.

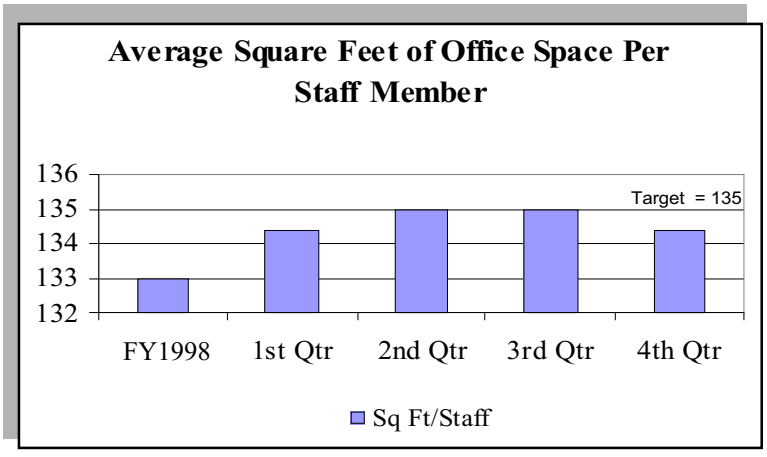


Figure 2.2.1

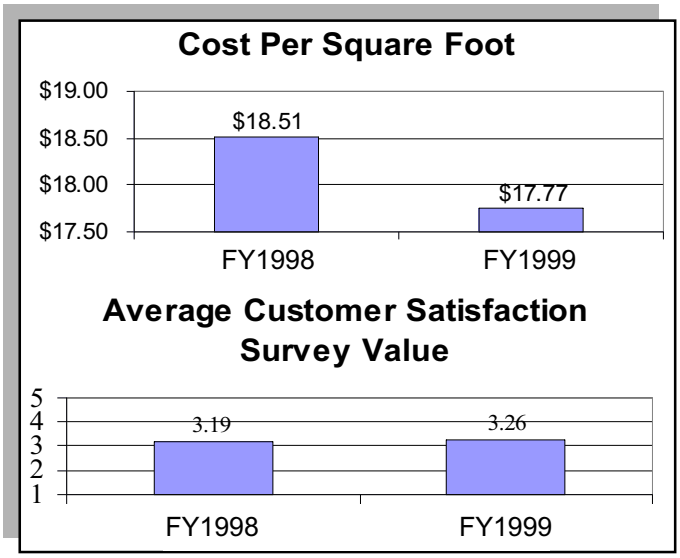


Figure 2.2.2

Staff Churn Rate: Churn rate is measure of the frequency of internal movement of staff and is considered a major benchmark for space managers. Our churn rate for FY1999 finished the year at 20.9% against our target of less than 50%. This certainly constitutes exceptional performance, but it is not entirely by design. When considered in light of the comment above that the Laboratory's current space portfolio is of limited flexibility, we must conclude that this value is artificially low, in part, due to the lack of office space for staff movement.

Continuous Improvement in F&O Operations realized from benchmarking: We entered FY1999 with high expectations for this performance indicator and have made substantial progress. This indicator measures two dimensions: improvement in the cost per unit measure position of the laboratory as a result of engagement in the benchmarking activities, and improvement in the facilities issues customer satisfaction survey. Working with these sub-indicators has given us a better understanding of the business dynamics, especially the labor and non-labor costs, associated with facilities operations and maintenance.

As a result of our benchmarking efforts and the subsequent implementation of lessons learned, the Laboratory decreased its overall cost per gross square foot of space from $18.51 to $17.77, see Figure 2.2.2, for a net decrease of 4% against our target of 5%. While we did not attain the target, we are happy to point out that the $0.74 decrease per gross square foot, amortized over the current 2,040,000 square feet of the Laboratory, represents a cost savings of $1.509M. In addition, it should be noted that total gross operating costs per gross square foot are down 8.7% overall, but were offset by increased Fixed Occupancy Costs, most notably a 9.9% increase in Rent/Lease costs.

The FY1999 Facilities Issues Customer Satisfaction survey showed some 2% improvement over the FY1998 survey but fell short of our 4% target. In some areas of the survey however, customer satisfaction increased as much as 13%. We are pleased with the modest improvement but feel that this indicator represents an area where additional focused attention is needed. Together, these indicators provide measurable positive improvement.

R&D Equipment Utilization: This indicator was intended to help the Laboratory understand the unused capacity existing across a suite of R&D equipment. We finished the year collecting 239 of the individual data points needed against our target of 256 proving that this type of information can be collected. The real lesson from this indicator however, was not in the percent of unused capacity that could be found in certain pieces of Laboratory equipment, rather the value of this indicator for staff was in the knowledge that a piece of equipment existed on site, and not in the fact that it had available capacity. The issue of modifying an existing database to contain this type of information, making it accessible to research staff, has been suggested as a possible Operations Improvement Initiative.

Facilities and Services Integration Composite: This indicator is composed of four sub-indicators: Increased Interaction with Other Hanford Site Contractors, Minimization of Impact to the Laboratory Due to Infrastructure Failures and Future Usage; Site Services Improvement; and Network Infrastructure Upgrade. It was designed to provide an overall evaluation of the Laboratory's processes for increasing the Laboratory's mission capabilities through its facility assets. We finished the year with strong performance in three of the four sub-indicators.

Increased Interaction with Other Hanford Site Contractors: We finished the year with a 90% participation rate in the Hanford Site Integration Group (SIG) matching our target. As part of this group, we have increased the integration between Hanford Site contractors with an aim of reducing the disconnects between contractors. We are trying to establish a long-term transition plan for Hanford Site Services, predominately in the 300 Area, in order to avoid an interrupted transition when the PHMC completes its clean-up work. Battelle staff also updated the PNNL portion of the Hanford EM Site Specification, establishing the technical baseline for Site clean-up activities.

Minimization of Impact to the Laboratory Due to Infrastructure Failures and Future Usage: In support of this performance indicator, Facilities staff updated 79% (33) of the targeted 42 Building Life Cycle Plans. The balance will be completed in FY2000. These plans are critical to management's understanding of where to invest critical long-term and short-term resources to ensure that the Laboratory has adequate facilities to support future science missions.

Site Services Improvement: As part of our role on the Hanford Site Integration Group, we proposed the development of a Site Users Group to the Site Integration Group. We also submitted a cost reduction proposal for a Waste Identification System that reduced our costs by approximately $1M in FY1999. Other Hanford Contractors have also adopted the process and could save significantly more than $1M each in FY2000, given the size of their waste handling efforts. In addition, the increased sensitivity we have created to the integration of site services among the Hanford Contractors resulted in the development of an integrated working group to review eleven site services, including: fire, locksmith, analytical services, emergency preparedness and other services.

Network Infrastructure Upgrade: This performance indicator was originally intended to serve as a launching pad for becoming Y2K compliant. It evolved to ensure that all network infrastructure projects are managed consistent with other PNNL projects. Specifically, network infrastructure upgrades are now managed as projects, not as *ad hoc* upgrades. In this way, we were able to complete four projects over the past fiscal year and at less cost than in previous years when we could only complete three. This represents significant savings in terms of cost and improved productivity. Unfortunately, two of the three projects scheduled for completion, were completed more than 30 days after the approved schedule date. As a result, this indicator rates a "Good" rating as opposed to an "Outstanding" rating.

Operational Excellence Performance Evaluation

The overall performance rating for this Critical Outcome is determined by comparing the total value in the following table to the rating scale at bottom.

Table 2.2. Objective 2.1, Indicator 2.1.1 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.1.1 Worker involvement, knowledge, and culture relative to ES&H			
2.1.1.1 Management interactions with workers to ensure staff involvement in work planning, knowledge of requirements and attitude/culture relative to ES&H	216 assessments	100	
2.1.1.2 Dose Index	0.16	20	
2.1.1.3 User involvement in SBMS Subject Area development	55%	45	
	Composite Total	165	4.9

Table 2.3. Objective 2.1, Indicator 2.1.2 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.1.2 ES&H training commensurate with assigned responsibilitie			
2.1.2.1 Completion of SDTP and required ES&H training	95.5%	100	
2.1.2.2 Completion of ES&H Training Courses	99.1%	20	
	Composite Total	120	5.0

Table 2.4. Objective 2.1, Indicator 2.1.3 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.1.3 Material Control			
2.1.3.1 Chemical Management System	90.4%	50	
2.1.3.2 Generator management of SAA (Slop Jars)	98%	80	
	Composite Total	130	4.4

Table 2.5. Objective 2.1, Indicator 2.1.4 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.1.4 ES&H Lagging Performance Indicators			
2.1.4.1 OSHA Lost Workday Case Incidence Rate (Lost Workday Case Rate)	0.6	100	
2.1.4.2 OSHA Recordable Case Incidence Rate (Recordable Case Rate)	1.7	80	
2.1.4.3 OSHA Lost Workday Incidence Rate (Lost Workday Rate)	10.4	40	
2.1.4.4 Unplanned Doses	0	100	
2.1.4.5 Spread of Radioactive Contamination	3	25	
2.1.4.6 Loss of Radioactive Sources	0	30	
2.1.4.7 Skin and Personal Clothing Contamination Events	12	-3	
2.1.4.8 Environmental Protection	2	50	
2.1.4.9 Transportation of DOE Hazardous Materials	0	20	
	Composite Total	442	4.6

Table 2.6. Objective 2.2, Indicator 2.2.1 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.2.1 Facilities (Buildings): Utilization of space is commensurate with science and technology mission needs			
2.2.1.1 Total office space assigned per number of staff members in an organization	134 sq ft	8	
2.2.1.2 Staff Churn Rate	21%	50	
2.2.1.3 Continuous improvement in F&O services and operations realized from benchmarking	0 pts.	0	
	Composite Total	58	3.4

Table 2.7. Objective 2.2, Indicator 2.2.2 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.2.2 R&D Equipment Utilization	239 pts.	76	4.5
	Composite Total		4.5

Table 2.8. Objective 2.2, Indicator 2.2.3 Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points
2.2.3 Infrastructure: Physical asset acquisitions and modifications follow an integrated and systematic process			
2.2.3.1 Increased level of interaction with other Hanford Site contractors on key issues supporting facility infrastructure and services	90%	100	
2.2.3.2 Minimization of impact to the Laboratory due to site infrastructure failures and future usage by development/ deployment of effective System Engineering process	79%	85	
2.2.3.3 Improve the scope definition and cost of site services by using activity-based and customer-focused methods	Outstanding	85	
2.2.3.4 Complete Scheduled Network Infrastructure Upgrade Projection Plans and Projects	Good	-10	
	Composite Total	260	4.4

Table 2.9. Operational Excellence Critical Outcome Performance Rating Development

Element	Value Points Tables 2.1-2.7	Weight	Performance Level	Effective Score	Wtd. Value Points	Obj. Weight	Weighted Points
2.0 Operational Excellence							
2.1 Sustain and enhance operational excellence in safety and health, and environmental protection							
2.1.1 Composite from Table 2.1	4.9	30%			1.5		
2.1.2 Composite from Table 2.2	5.0	30%			1.5		
2.1.3 Composite from Table 2.3	4.4	30%			1.3		
2.1.4 Composite from Table 2.4	4.6	10%			0.5		
				Obj 2.1 Total	4.8	67%	3.2
2.2 Increase mission capabilities through enhancement and effective use of Laboratory facilities and equipment							
2.2.1 Composite from Table 2.5	3.4	60%			2.0		
2.2.2 Value from Table 2.6	4.5	10%			0.5		
2.2.3 Composite from Table 2.7	4.4	30%			1.3		
				Obj 2.2 Total	3.8	33%	1.3
						Total	**4.5**

Table 2.10. Operational Excellence Critical Outcome Final Rating

Total Score	5.0 - 4.5	4.4 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 1.0
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

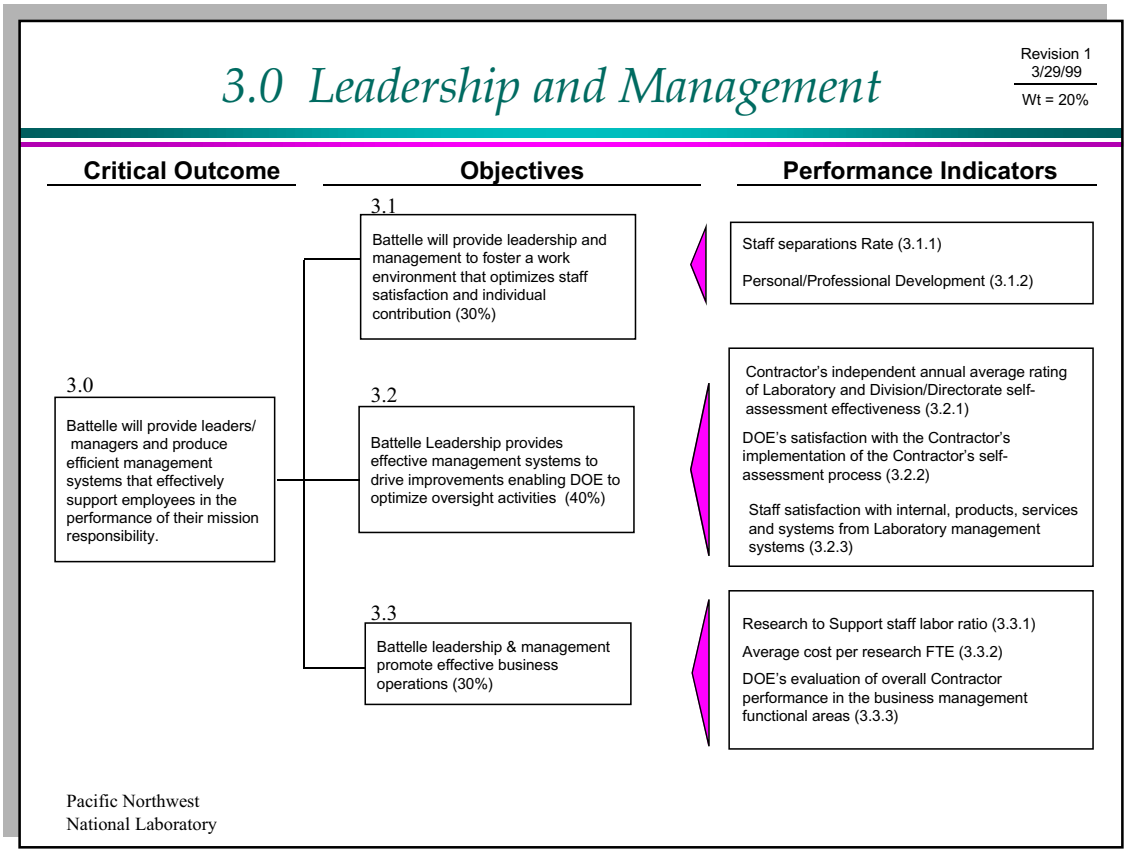
3.0 Leadership and Management

The Department of Energy's Strategic Plan establishes four primary critical success factors. Two of these critical success factors are Communication and Trust, and Human Resources. We recognize that the heart of the Laboratory is made up, not of facilities and equipment, but of our research and support staff. Managing the Laboratory in the complex world of today requires effective and involved leaders. The recognition that effective leadership and management are critical to our success, both at the personal level and at the institutional level, is especially important in light of the long-term implications of the programmatic and staff reductions the Laboratory experienced in 1995.

Additionally, leaders, managers and staff cannot deliver high quality products and services without the support of world-class management systems. We have developed the set of management systems critical to the expert delivery of our products and services. We use our assessment process to provide management with accurate technical, business and operational performance information that promotes early identification and resolution of problems that may impact achievement of the Laboratory's Critical Outcomes.

For these reasons and in partnership with DOE, the Laboratory established the following Critical Outcome, objectives, and performance indicators to guide our efforts and monitor our progress.

The Leadership and Management Critical Outcome Tree, detailing the Critical Outcome and its' supporting Objectives and Performance Indicators, is presented below.



Summary

Battelle is providing leaders, management systems, and an environment that is supportive of innovation needed to accomplish the science and technology mission. Two initiatives to support this assertion started in previous years to improve the quality of work life and implementation of self-assessment are now distinguishing themselves as evidenced by comparing performance results to other Research and Development organizations and commercial practices.

Battelle has a two-pronged approach to assess and improve the level of staff satisfaction in the Laboratory. The Staff Voluntary Separations Rate provides an indication of staff satisfaction. The current Rate not only is low (5.8%) but comparative data show that Battelle is among the top 25% of similar Research and Development organizations in minimizing voluntary separations. Staff satisfaction has been improved by focusing on a key element of satisfaction - Personal and Professional Development. Where this has been a weakness in the past, actions taken by management in FY1999 have made this area a strength as evidenced by comparative data from International Survey Research (ISR) data.

Battelle's self-assessment process is maturing beyond our expectations. Independent evaluations of Laboratory self-assessment processes were made using an internationally recognized evaluation framework, comparing the Laboratory's performance against industry leaders. Results from this evaluation show that the Laboratory's business results exhibit performance levels that are "Above Average" in comparison to other companies. A survey of DOE-RL also suggest that Battelle is making strong progress regarding implementation and deployment of self-assessment to drive improvement. The DOE-RL survey results acknowledged this fact by having over 90% of the respondents state that they were "satisfied or better" with the contractor's efforts to use self-assessment to drive improvement.

While management systems have clearly made improvements in effectiveness and efficiency, especially as viewed by our customers, efforts to improve cost effectiveness continues to be a challenge. Research-to-Support Staff Labor Ratio performance trends did not meet expectations due to the Laboratory falling behind on direct Full Time Equivalents (FTEs) and an increased investment in organizational overhead. This increased investment is expected to provide a return to the Laboratory in the form of higher growth over the long term. The Average Cost Per Research FTE did meet performance expectations as a result of increased hiring of research staff, providing the Laboratory with a solid foundation to begin FY 2000. Overall however, the Laboratory continues to use cost management tools to hold lab-level overhead rates flat for the past three years.

Based on the evidence provided in this self-evaluation, our overall performance rating on this critical outcome is **Outstanding**.

Objective 3.1: Battelle will provide leadership and management to foster a work environment that optimizes staff satisfaction and individual contribution.

Results

Battelle is committed to providing the leadership necessary to ensure a quality work life environment for our staff. We have been conducting quality of work-life surveys for the past three years to quantify this environment. These surveys are intended to provide insights as to how we can develop and retain a diverse staff recognized for scientific, intellectual, and personal leadership for the integrity of our research and business practices. Two findings have resulted from this effort - minimize the amount of surveying of staff and use the information collected to focus efforts on areas that will lead to greater levels of staff satisfaction.

To minimize the impact of staff surveys, a surrogate performance indicator has been developed to monitor the level of staff satisfaction. The Staff Voluntary Separations Rate provides this monitoring capability. For FY1999, the Separations Rate not only met performance expectations, but Battelle's separations rate is among the top 25% of all Research & Development companies as defined by the Saratoga Institute.

Battelle has used the previous Quality of Work-life Survey to focus it's efforts on an area that is a strong determinant of staff satisfaction - Personal and Professional Development. The indicator of success in making progress in this area is a comparison of Battelle's Quality of Work-life results with International Survey Research (ISR) data. FY1998 survey data showed that Battelle was 11% below comparisons to ISR data for Research and Development companies. Battelle embarked on a concerted effort to strengthen the performance review process and provide opportunities for personal and professional growth during FY1999. This years' Quality of Work-life survey results showed that Battelle made the desired improvements when staff rated the composite questions surrounding Personal and Professional Development greater than one standard deviation above the ISR norm.

Based upon our progress toward the performance indicators that provide the evidence of achieving this objective, our rating for FY1999 is **Outstanding**.

Analysis

Staff Voluntary Separations Rate

This new performance indicator for FY 1999 is intended to accomplish two things:

1. Establish a causal relationship between the Separations Rate and improvement actions instituted by management for areas important to staff member satisfaction. This will also allow management to monitor the trending of the Separations Rate as an indicator of staff satisfaction rather than completing an exhaustive survey each year.

2. Comparisons of Battelle's Separations Rate to other companies within the same industry. This will characterize the performance level and capabilities of Battelle's staff retention efforts.

The Staff Voluntary Separations Rate is calculated by dividing the number of employees voluntarily leaving Battelle by the total number employed during that same period of time. Battelle asserts that a causal relationship exists between the Separation Rate indicator and improvements made to staff member's quality of work life through the Division/Directorate action plans (developed as a result of findings associated with the Quality of Work-life survey). The performance trend of the Separations Rate provides management with a predictive indicator in gauging the efficacy of their actions to improve the quality of work life. Figure 3.1.1 demonstrates this trend over the previous three years.

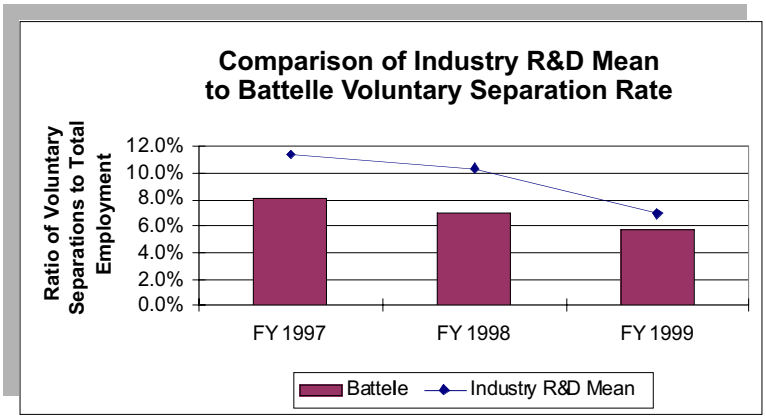


Figure 3.1.1

For FY 1999, the Laboratory Separations Rate was compared to the 1999 Edition of the Saratoga Institute (SI), "Human Resources Financial Report" to further validate the performance level of Battelle's staff retention efforts. The results show that Battelle is in the top 25% percentile of all Research and Development industries that are participants in sharing the SI data. Figure 3.1.1 provides a comparison to the SI mean data for similar industries and suggests that Battelle's effort to retain staff is among the industry's best.

Further analysis of the voluntary separations data for FY1999 show that the unskilled positions (non-Exempt) make up half of the voluntary separations with the bulk of those separations in the traditionally high turnover area of student interns. Voluntary separations in the critical job categories (Scientists and Engineers) show no abnormality—the ratio of critical job separations to total separations is similar to the ratio of critical staff to the total employment.

Personal/Professional Development

Pacific Northwest National Laboratory (PNNL) engaged International Survey Research (ISR) to design, process, and report the results from the Spring 1999 Quality of Work Life (QWL) survey. The survey was administered to all staff members of PNNL from April 12-30, 1999. From a target population of 3300 staff members, 1785 participated in the survey process. This represents 54% return rate and is sufficient to provide statistical validity of the results of the Lab overall.

The following summarized PNNL's 1999 QWL results for Personal/Professional Development. ISR incorporated items from its U.S. Research & Development (R&D) norm into PNNL's survey. The U.S. R&D norm represents organizations across the U.S. with either (a) significant R&D functions/divisions or (b) research and development focused organizations. The norm is comprised of 24,082 cases. Some of the organizations included in the norm are Argonne National Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Bell Labs Innovations, and Phillips Electronics. ISR norms are updated on an annual basis, therefore reflecting the most current response to these questions.

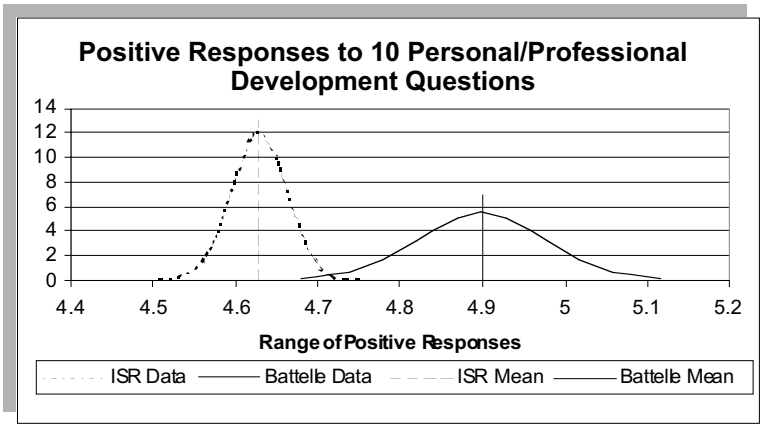


Figure 3.1.2

Ten questions within the QWL survey were agreed upon between PNNL and DOE/AMT for evaluating Personal/ Professional Development. These 10 questions form a composite for comparison to ISR's U.S. R&D norm. A composite score of all 10 questions was computed for the average and standard deviation composite scores. Figure 3.1.2 demonstrates how Battelle exceeds expectations by having the composite average positive response is greater than one standard deviation above the U.S. R&D norm of the ISR data.

Objective 3.2: Battelle Leadership provides effective management systems to drive improvements enabling DOE to optimize oversight activities.

Results

Battelle's management systems are the delivery vehicle of contractual requirements and efficient operations to the Laboratory. In FY1999, Battelle used performance indicators to assess the effectiveness of those management systems from an independent perspective, an external customer perspective and an internal customer perspective. Independent evaluations of Laboratory results from using these processes were made using an internationally recognized evaluation framework, comparing the Laboratory's performance against industry leaders. Results from this evaluation show that the Laboratory's business results exhibit performance levels that are "Above Average" in comparison to other companies.

Other independent evaluations and a survey of DOE-RL also suggest that Battelle is making strong progress regarding implementation and deployment of self-assessment to drive improvement. The DOE-RL survey results acknowledged this fact by having over 90% of the respondents state that they were "satisfied or better" with the contractor's efforts to use self-assessment to drive improvement. Continued efforts to forge relationships between Battelle and DOE-RL are being made with the vehicle being the Self-Assessment activities.

Finally, Battelle offers an annual survey to Laboratory staff to assess their overall level of satisfaction with our management systems. The results exceeded expectations with an average response of 3.75 on a 5-point Leikert scale. This translates to 80% of Laboratory staff being satisfied or better. Suggested improvements were made such as requesting that "management systems focus their support on the managers, scientists, and engineers who work in the Laboratory."

Based upon our progress toward the performance indicators that provide the evidence of achieving this objective, our rating for FY1999 is **Outstanding**.

Analysis

Contractor's independent annual averaged rating of Laboratory and Division/Directorate Self-Assessment effectiveness: The Laboratory conducted three independent evaluations in FY 1999 to judge the effectiveness of its self-assessment processes, the strength of actual business results achieved, and the efficacy of its Leadership process. An internationally recognized evaluation framework was used to compare the Laboratory's performance against industry leaders such that best practice data could be used to improve capability.

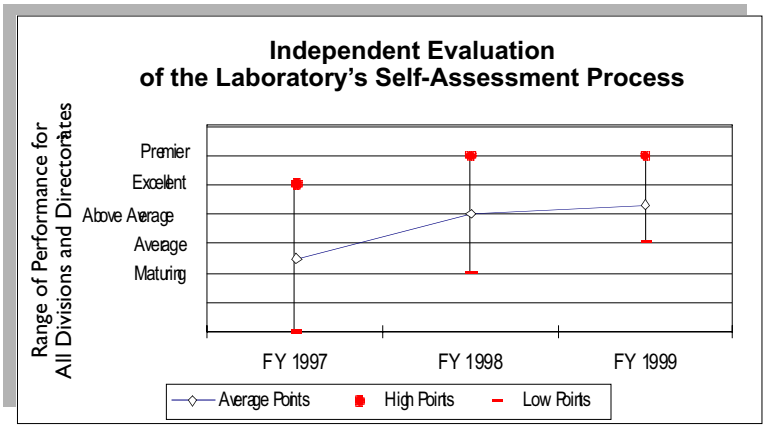


Figure 3.2.1a

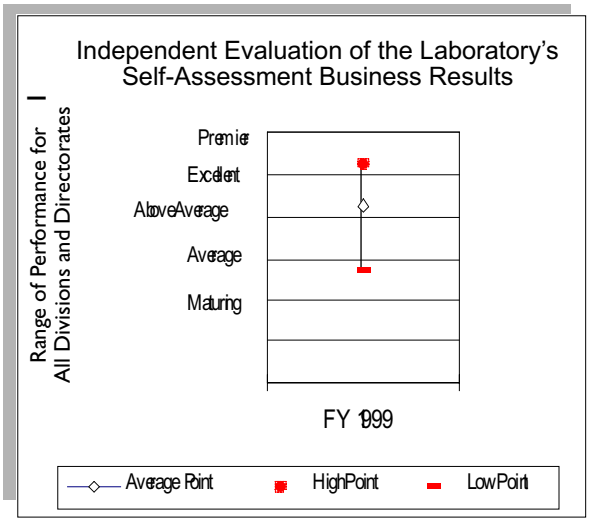


Figure 3.2.1b

Effectiveness of the self-assessment process—The Laboratory has been using self-assessment to define organizational health and drive improvement for the past four years. An assessment by independent evaluation teams of the effectiveness of the Laboratory self-assessment process has been made each of the last three years to judge the maturity and understand causal factors in the use of the process to drive improvement. For FY1999, the results are shown in Figure 3.2.1a. The increase between FY1998 and FY1999 data can be attributable to an improvement in the selection of performance indicators and use of comparative data.

Strength of Actual Business Results Achieved—This is the first year that business results were independently evaluated for Divisions and Directorates. Business results represent the output of sound processes related to achieving compliance, self-assessment activities, Laboratory operations, customer focus, strategic planning, and staff development. These business results were evaluated against a common framework to allow comparability to other businesses. Figure 3.2.1b provides this comparison and includes the range of performance for all Divisions and Directorates.

Based upon this independent evaluation, the Laboratory's business results exhibit performance levels that are "Above Average" in comparison to other businesses. This is determined by evaluating the trending of results, achievement of performance targets, and comparisons to competitors.

The Strength of the Laboratory's Leadership Process—An independent evaluation of the Laboratory's Leadership process was conducted during the 4th Quarter of FY 1999 by two expert evaluators in the commercial industry and one evaluator within the Federal Government (U.S. Department of Transportation). Using a document prepared by the Laboratory, which described our processes

in the areas of strategy development and deployment, communication of strategy, and community stewardship, these evaluators provided feedback to the Laboratory describing strengths and opportunities for improvement. A specific strength identified was "The Leadership Team utilizes a systematic Leadership Process that sets, communicates, and deploys Laboratory values and performance expectations. The embedded Communications Strategy integrates values and strong customer/stakeholder focus and is a basis for review, comment, action, and feedback." Opportunities for improvement were expressed as the "description of how future (business) opportunities are sought appears to be reactive versus proactive" and "Innovation opportunities do not appear to be included (as) Operations Improvement Opportunities - that seems to be unusual for a laboratory." Overall, the evaluators were impressed with the Leadership processes and rated the Laboratory as a "premier" institution as compared to other international businesses. The independent evaluations comprising this performance indicator had the results indicated in Table 3.2 below.

Table 3.2. The Results of the Leadership Processes Evaluation

Evaluated Area	Performance Level	Actual Points	Target Points
Self-Assessment	Above-Average	37	42
Business Results	Above Average	192	225
Leadership	Premier	75	63
Total		304	330

DOE's Satisfaction with the implementation of the Contractor's self-assessment process: DOE-RL annually surveys their staff to provide a customer perspective to the Laboratory on the efficacy of the Laboratory's Self-Assessment activities and provide feedback to the Laboratory regarding opportunities for improvement. From DOE-RL's perspective, a strong Self-Assessment process can continuously improve products and processes as well as preclude unwarranted external oversight activity.

Based upon results from the FY1998 Survey, Battelle and DOE-RL assumed a causal relationship exists between DOE-RL's understanding of the Integrated Assessment process and satisfaction with their level of involvement in Assessment activities. Furthermore, Battelle believed that if DOE-RL increased their involvement in Assessment activities, they would recognize how the Assessment process is driving improvement within the Laboratory. Specific efforts were made during FY 1999 to forge relationships between Battelle and DOE-RL with the vehicle being Self-Assessment.

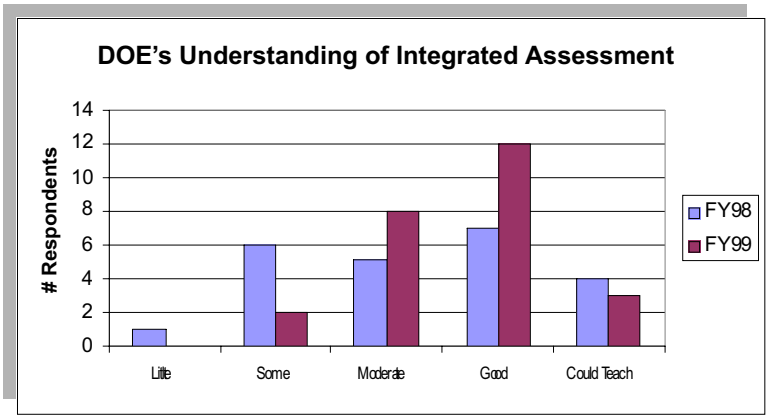


Figure 3.2.1

When comparing levels of understanding between FY1998 and FY1999, DOE-RL's understanding of Integrated Assessment rose dramatically as seen in Figure 3.2.1, coupled with the positive shift in DOE-RL's satisfaction with their level of involvement in the Laboratory's Self-Assessment activities (Developing Performance Objectives and Indicators, Monitoring Performance, Evaluating Performance, and Implementing Improvements) as noted in Figure 3.2.2, resulted in a major

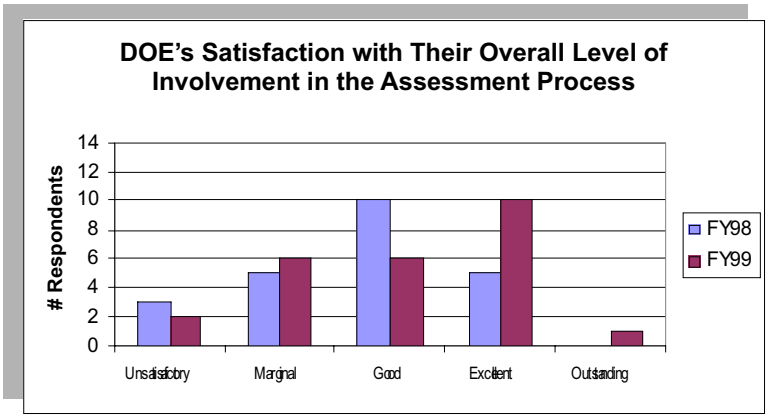


Figure 3.2.2

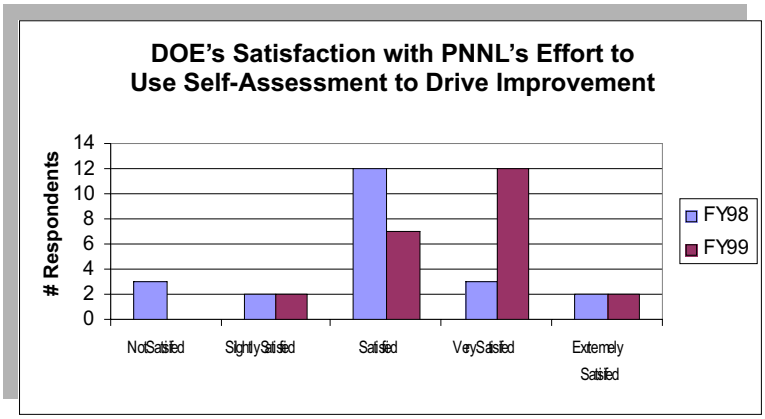


Figure 3.2.3

shift in DOE's satisfaction with the Laboratory's use of Self-Assessment to drive improvement per Figure 3.2.3.

The FY99 Critical Outcome performance target for this indicator was to have 90 percent or more of the respondents satisfied. Not only was this target exceeded (91 percent), but perhaps of greater significance was the movement from those merely "satisfied" to "very satisfied." However, one area that provides the Laboratory with an opportunity for improvement is in "considering (the) needs" of the DOE customer as part of the Assessment process. Twenty-one percent of the survey respondents identified this effort on the part of the Laboratory as marginal or unsatisfactory.

Staff Satisfaction with Internal Products, Services, and Systems from Laboratory Management Systems: Several Management System (MS) owners (and the DOE) communicated their desire to receive specific, actionable feedback for improving their MS. Therefore, to increase the efficacy of this survey, several enhancements were suggested, including:

- Using the survey to communicate to Laboratory staff that internal products and services are delivered through management systems
- Understanding staff perceptions on two dimensions (actions of MS staff and delivery of MS tools) - such that MS owners can make specific plans to improve
- Understanding the differences between the needs of researchers and support staff
- Allowing respondents to specify areas of satisfaction and areas needing improvement via comment capability

The MS survey was conducted the last two weeks in April in conjunction with the Quality of Work-life Survey, as an add-on survey rather than as an embedded element as it had been in the past. The survey response rate was a disappointingly low 20% in contrast to the FY 1998 survey response rate. This low rate may suggest the need to revisit having two separate surveys since the overall FY 1999 Quality of Work-life response rate was 53%. The poor response rate makes it difficult to draw conclusions that are representative of the Laboratory as a whole. Nevertheless, the responses do provide a foundation from which improvement actions can be taken. Figure 3.2.4 provides Battelle's performance against an increasing performance target. In summary, the overall level of

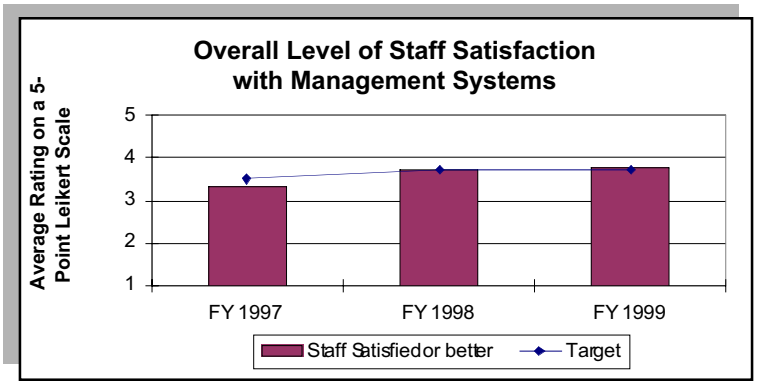


Figure 3.2.4

satisfaction for the FY 1999 survey averaged 3.75 on a 5-point Leikert scale. This average score exceeded the performance target of 3.7 and translates to 80% of Laboratory staff being satisfied or better. Additionally, 58 comments were received, with nearly 75% of the comments offering suggestions for improvement. A common comment for improvement is for the MS to focus their support on the managers, scientists, and engineers who work in the Laboratory. In other words, develop and maintain products, policies, and procedures that provide value to the researchers and assure that the MS staffs provide high levels of customer satisfaction.

Objective 3.3: Battelle leadership and management promote effective business operations

Results

Battelle continues to provide leadership by carefully managing the total operating cost of the Laboratory to meet cost commitments to customers. Indicators providing the evidence of this management capability were generally positive. The Research-to-Support Staff Labor Ratio performance trends did not meet expectations due to the Laboratory falling behind on direct Full Time Equivalents (FTEs) and an increased investment in organizational overhead labor costs. However, the Average Cost Per Research FTE did meet performance expectations as a result of increased hiring of research staff.

An area where Battelle expects to perform well is the DOE-RL evaluation of our Business Management Oversight Process (BMOP) functions. This evaluation considers our ability to promote effective business operations in delivering products and services and complying with applicable requirements.

Based upon our progress toward the performance indicators that provide the evidence of achieving this objective, our rating for FY1999 is **Excellent**.

Analysis

The Research to Support Staff Labor Ratio: This indicator provides insight to how the Laboratory is deploying its staff. It is expressed as a ratio of staff labor dollars expended on research activities relative to staff labor dollars expended on support activities. The goal is to maintain an appropriate balance between research staff and support staff.

Battelle's performance on this FY1999 indicator did not meet expectations. This was due to the Laboratory falling behind on direct FTEs - Research staff, and an increased investment in organizational overhead labor costs - Support staff. This increased investment is expected to provide a return to the Laboratory in the form of higher growth over the long term. Nevertheless, in FY1999,

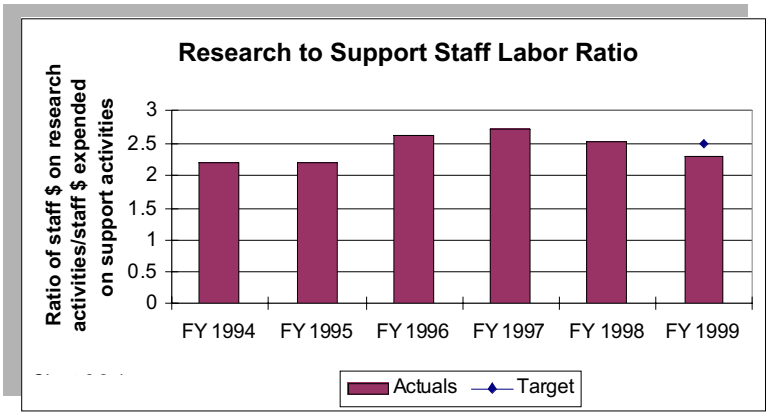


Figure 3.3.1

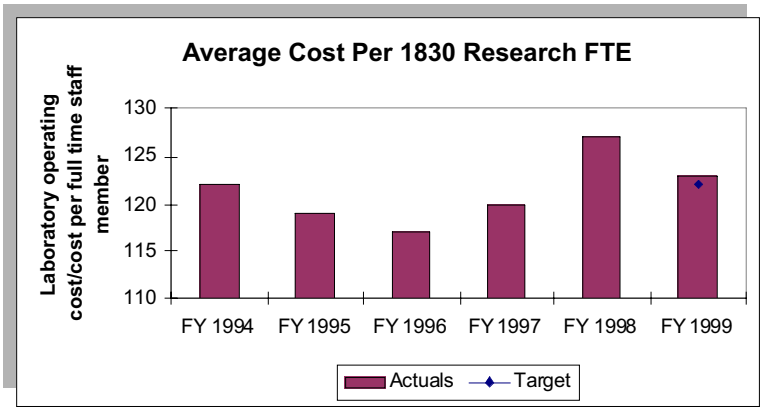


Figure 3.3.2

Battelle managed total overhead costs to the fiscal year plan to maintain our rate structure to customers by reducing discretionary overhead spending. This proactive cost management effort in not reflected in this indicator but is addressed in the Average Cost Per Research FTE. Figure 3.3.1 provides the performance against target for the Research to Support Staff Labor Ratio.

Average Cost Per Research FTE: This indicator provides a measure of the 1830 contract operating cost of the Laboratory (less capital and subcontracts) expressed as an annual cost per full-time staff member deployed on research activities.

Significant improvement occurred on this performance indicator in the 4th quarter of FY 1999 from earlier quarters causing the Average Cost Per Research FTE to meet our performance expectations but fall short of the performance target. While Battelle managed the total operating cost of the Laboratory to targeted performance levels, a significant increase in Associated Western Universities (AWU) students and increased hiring during the 4th quarter, contributed to meeting the performance expectations. Figure 3.3.2 provides the performance against target for this indicator.

DOE's evaluation of Overall Contractor Performance in the Business Management Functional Areas: This indicator subjectively measures the overall effectiveness/performance of the Business Management Oversight Process (BMOP) functions in delivering products and services and complying with applicable requirements. This indicator is a composite rating from DOE-RL for the BMOP activities they choose to evaluate at the end of FY 1999.

The DOE-RL business management organizations will utilize Battelle's Self-Assessment results as the primary means for this performance evaluation. DOE-RL business management organizations may also utilize on or more of the following, in addition to Self-Assessment, in evaluating Battelle's performance on this indicator:

1. Operational awareness/daily oversight activities
2. For Cause Reviews (there were none identified during FY1999)
3. Other outside agency reviews
4. Annual 2-Week review

With all BMOP 16 functions weighted equally, the final average rating for FY1998 was a 4.3. Scoring was based upon a scheme where an Outstanding received a 5.0, Excellent received a 4.0, Good was a 3.0, Marginal was a 2.0 and Unsatisfactory was a 1.0.

DOE-RL will not begin their annual 2-Week review until November 8, 1999 and hence, no definitive performance level can be provided. However, Battelle's position on the expected performance level of this indicator is similar to the positive progress noted in the management systems (of which the BMOP activities are a subset) under Objective 3.2. Objective 3.2 exceeded expectations with an Outstanding rating, similarly this indicator should be in the same Outstanding range with an average rating of 4.5.

Leadership and Management Performance Evaluation

The overall performance rating for this Critical Outcome is determined by comparing the total value in Tables 3.1 and 3.2, below, to the rating scale in Table 3.3 at bottom.

Table 3.1. Leadership & Management Critical Outcome Performance Rating Development

Element	Performance Level	Effective Score	Value Points	Weight	Weighted Points
3.0 Leadership and Management					
3.1 Battelle will provide leadership and management to foster a work environment that optimizes staff satisfaction and individual contribution.					
3.1.1 Staff separation rate	25th perct.	75			
3.1.2 Personal/Professional Development	>1 Std. Dev.	40			
	Obj 3.1 Total	115	4.6	30%	1.4
3.2 Battelle Leadership provides effective management systems to drive improvements enabling DOE to optimize oversight.					
3.2.1 Contractor's independent annual averaged rating of Laboratory and Division/Directorate Self-Assessment effectiveness.	304	96			
3.2.2 DOE's satisfaction with the implementation of the Contractor's self-assessment process	91%	60			
3.2.3 Staff satisfaction with internal products, services, and systems from Laboratory mgmt systems	3.75	60			
	Obj 3.2 Total	216	4.9	40%	2.0
3.3 Battelle leadership and management promote effective business operations					
3.3.1 Research/Support staff labor ratio	2.3	-50			
3.3.2 Average cost per research FTE	$123	80			
3.3.3 DOE's evaluation of overall Contractor performance in the business management functional areas	4.5	70			
	Obj 3.3 Total	100	3.8	30%	1.1
				Total	4.5

Table 3.2. Leadership and Management Critical Outcome Final Rating

Total Score	5.0 - 4.5	4.4 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 1.0
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

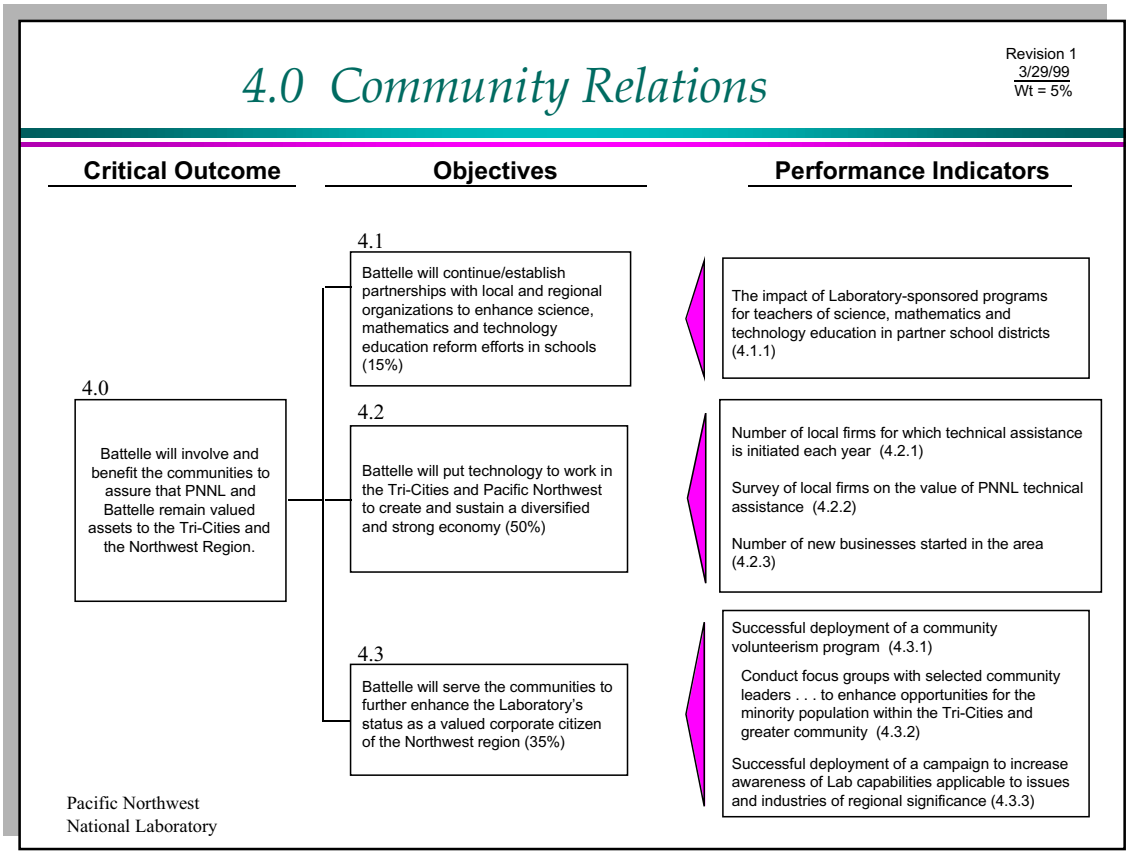
4.0 Community Relations

As an adjunct to the Department of Energy's core missions, the DOE Strategic Plan establishes goals to help Industry make the transition from a nuclear research and production capability to one of pollution prevention and waste minimization. The DOE has made a strong commitment to help local economies transition to a post-cleanup world in which thousands of DOE-supported jobs will disappear and must be replaced by private-sector activities.

Just as the PNNL's business mission underlines its role of advancing technology in the Northwest Region, so too does Battelle's commitment to the local communities drive its efforts to serve the neighborhoods in which the staff live and work, the local multi-county region and the Laboratory through economic development, open communication and science, mathematics and technology education reform.

For these reasons, and in partnership with the DOE, the Laboratory has established the Community Relations Critical Outcome, and its supporting objectives and performance indicators, to guide our efforts and to monitor our progress toward our goals.

The Community Relations Critical Outcome Tree, detailing the Critical Outcome and its' supporting Objectives and Performance Indicators, is presented below.



Summary

The Laboratory and Battelle are making a difference in the community. We have exceeded our community relations goals for FY1999. The Laboratory continues to have a significant impact on science, mathematics and technology education reform in the region. We surveyed the 80 teachers that participated in three summer programs with PNNL staff across three dimensions, content, skills and application to the classroom. The results of the survey indicated that 90.5% of the teachers responding rated the programs at sums of 10 or greater indicating their belief that the programs had high impact to the quality of learning experiences in their classrooms.

We are helping create a diversified and strong economy by putting technology to work in the Tri-Cities region. In FY1999 we launched, helped launch, or helped expand 10 new businesses, bringing to 32 the number of new technology-based businesses started or expanded in the local area since the beginning of FY1997. To assist ongoing businesses, Laboratory staff participated in 61 technical assistance projects with local firms in FY1999. Follow-on surveys of those firms indicated that 90% of them were either "satisfied" or "very satisfied" with the quality of the assistance provided.

In addition to our outstanding efforts at having an impact on local education and at diversifying and strengthening the local economy, Battelle staff are active volunteers in the local community, embracing the needs of local minorities and are aggressively working to increase name recognition of the Laboratory with state opinion leaders and government officials. Team Battelle was launched with resounding success in FY1999, engaging hundreds of staff volunteers in 36 individual programs. The 1998 Community Survey identified a perception by the Tri-City minority communities that Battelle was not adequately meeting their needs. Focus groups were held with local minority leaders to address this perception and to better understand the types of activities that could be undertaken to enhance our relationship with the minority communities. The Minority Community Relations Report and Action Plan is the culmination of the focus group efforts. Actions identified in the Action Plan will be tracked via the self-assessment process. As part of the Action Plan, in Minority Community Relations Advisory Committee was formed. The Committee will serve as a conduit for information among, and between, the minority communities and Battelle.

Finally, to bring the capabilities of the Pacific Northwest National Laboratory to the attention of state opinion leaders and government officials, a pilot campaign was launched aimed at state opinion leaders with the intention of increasing PNNL name recognition as a leader in the Washington biotechnology industry. In support of this indicator, a number of significant activities were undertaken in FY1999 resulting in, among other activities, the Governor's Office request for PNNL assistance in the State Salmon Recovery Program, the presentation of DOE-sponsored agriculture, biotechnology and Clean Production activities to the APEC Industrial Science & Technology Working Group, and PNNL staff participation with the governor on the Washington State Mission to Mexico, representing DOE efforts in biotechnology, environment, energy, and climate change.

Based on the evidence provided in this self-evaluation, our overall performance rating on this critical outcome is **Outstanding**.

Objective 4.1: Battelle will continue/establish partnerships with local and regional organizations to enhance science, mathematics, and technology education reform efforts in schools.

Results

Battelle continues to have a significant impact on science, mathematics and technology education reform in the region. At the conclusion of FY1999, we surveyed the 80 teachers that participated in three summer programs with PNNL staff. The teachers rated the impacts of each of the programs using a four-point Likert Scale (1 being low impact, and 4 being high impact) across three dimensions, content, skills and application to the classroom. The three scores were then combined to give one score reflecting the impacts of each of the programs. The results of the survey indicated that 90.5% of the teachers responding rated the programs at sums of 10 or greater indicating their belief that the programs had high impact to the quality of learning experiences in their classrooms.

Based upon the performance indicators that support this Objective, our rating for FY1999 is **Outstanding.**

Analysis

The impact of Laboratory-sponsored programs for teachers of science, mathematics, and technology education in partner school districts: The focus of this indicator in FY1999 has shifted from the FY1998 emphasis of students and teachers, to one of being able to impact the teachers in the classroom. During FY1999, PNNL hosted three lab-sponsored programs: the Partnership for Arid Lands Stewardship (PALS) Teacher Project, the Scientist-Student (SST) High School Research Project, and the Teacher Research Participation (TRP) Project. Eighty (80) teachers participated in the summer programs. The impact of these programs on the participating teachers was measured by evaluating the program's ability to enhance teachers content knowledge, skills and abilities to transfer the experience to the classroom. Seventy-four (74) of the teachers returned the post-event survey. Of those 74, 90.5%, or 67 teachers, rated the program as a 10 or higher, surpassing the target of 83%.

Objective 4.2: Battelle will put technology to work in the Tri-Cities and Pacific Northwest to create and sustain a diversified and strong economy.

Results

PNNL has again had an outstanding year at putting technology to work in the Tri-Cities region in FY1999. We launched, helped launch, or helped expand 10 new businesses, and Laboratory staff participated in 61 technical assistance projects with local firms. Additionally, 90% of firms to which we provided technical assistance indicated that they were "satisfied" or "very satisfied" with the quality of the assistance provided.

Based upon the performance indicators that support this objective, our rating for FY1999 is **Outstanding.**

Analysis

The number of local firms for which technical assistance is initiated each year. Throughout FY1999 PNNL staff participated in 61 technical assistance projects with local technology-based firms. This participation musters the physical and intellectual resources of the Laboratory to assist in solving problems encountered by the businesses and exceeds the target of 55 technical assistances established for the year. These assistances resolve problems that the participating firms do not have resources to resolve in their own. The 61 assistances provided in FY1999 brings the total number of assistances provided to local firms since the beginning of FY1996, to more than 200. Figure 4.2.1 provides a comparison of FY1999 to previous years.

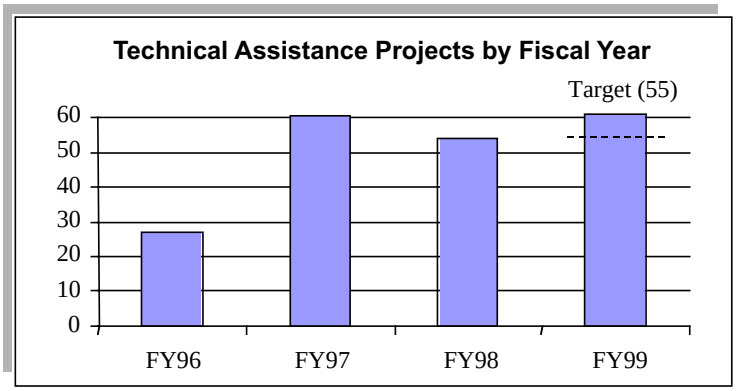


Figure 4.2.1

Survey of local firms on the value of PNNL technical assistance. In addition to providing technical support to the largest number of firms since FY1996, the quality of our support remains high. At the close of each technical assistance project, a survey is conducted of the firm that received the assistance in order to assess the quality of our participation.

As in past years, local assisted firms were surveyed using a 5-point Likert Scale. Of the firms that responded to the survey, 90% indicated that they are "satisfied" to "very satisfied" with the quality of Battelle staff assistance, in contrast to the 80% "satisfied" or "very satisfied" target established for the year. Local firm satisfaction rates have historically hovered between 90% and 92%.

The number of new businesses started in the area: We achieved 10 new business starts or expansions during FY1999 versus our target of 10. The fact that we achieved the target for this performance indicator for the third year in a row is outstanding see Figure 4.2.2. This is especially noteworthy considering the degree of involvement PNNL has in each of these businesses, sometimes taking months or years to close a deal, and because at mid-year we were only confirmed of three new business starts. The energy and momentum generated early in the year however, paid off. A list of the FY1999 new business start-ups and expansions is provided below.

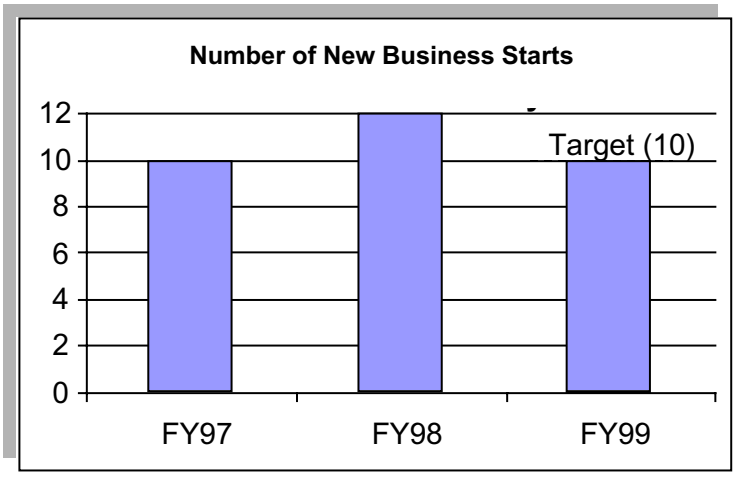


Figure 4.2.2

It should also be noted that it is highly unlikely that we will be able to maintain our now-three-year pace and hit this target again in FY00. The lack of direct funding required to assist in new business start-ups and expansions is problematic.

PNNL-Assisted New Business Starts for FY1999:

Agri-Biotics – Agri-Biotics is a Pasco firm that has a license from Battelle to commercialize a technology to manufacture higher-value products from potato processing waste. Products include biodegradable dust suppressant, livestock feed, and fertilizer/micronutrient carrier.

Airtek – Airtek is a new joint venture between Innovatek of Richland and Airex of Bellevue to develop and manufacture a portable system to purify and decontaminate air in small environments, such as operating rooms. Airtek will manufacture components in both Bellevue and Richland, while system integration will be done at APEL in Richland.

Custom Catalogs Online – Custom Catalogs (ccol) is a firm owned by a former staff member that develops and hosts on-line catalogs for various establishments. while CCOL has two local clients, the vast majority of its business is for clients spread throughout the nation, including a high-end automobile importer, a wholesale restaurant supplier, and a manufacturer of lawn and garden implements. PNNL provided substantial technical assistance to CCOL.

Custom Twist Woolen Mill – Custom Twist Woolen Mill (CTWM) is a start-up business located in an excessed DOE building in the 1100 area. CTWM is implementing a novel business model to perform custom spinning for sheep ranchers so that the ranchers retain a much greater percentage of the value-added for their product than if they sell fleeces to large mills. One of the partners of CTWM is a PNNL staff member with permission for an outside activity. PNNL also provided some excess plant equipment that is essential to CTWM's operations.

EDAX (C-Thru) – EDAX is the new name of a company that was formerly C-Thru Technologies, and before that, Scitec. EDAX manufactures various handheld devices that embody X-ray fluorescence (XRF) technology. PNNL is collaborating with EDAX to add a new product to its line, the XRF module of on-board oil analysis systems. On-board oil analysis is a technology that PNNL is pursuing in a variety of applications, including railroad locomotives, battle tanks, Navy ships, and heavy trucks. PNNL has teamed with EDAX to be the sole supplier of XRF modules for all of its on-board oil analysis systems.

FastRack – FastRack is a Richland firm that developed and manufactures an innovative bicycle carrier that quickly and easily attaches to the receiver hitch of a vehicle. The FastRack carrier will safely hold any type or size of bicycle, and is faster to load than other carriers. FastRack sells most of its carriers throughout the nation via the internet. one of the owners of FastRack is a PNNL staff member with permission for an outside activity. pnnl provided technical assistance to FastRack early in product development, and funded a marketing study by WSU MBS students last spring.

Custom Catalogs Online – Custom Catalogs (CCOL) is a firm owned by a former staff member that develops and hosts on-line catalogs for various establishments. While CCOL has two local clients, the vast majority of its business is for clients spread throughout the nation, including a high-end automobile importer, a wholesale restaurant supplier, and a manufacturer of lawn and garden implements. PNNL provided substantial technical assistance to CCOL.

Knovation – Knovation, in partnership with Lockheed Martin Services, is a new start-up that arranges and sells pre-paid computer software support. Knovation offers its support services throughout the u.s. and the world. PNNL, through consultants, assisted Knovation in arranging seed capital. PNNL also funded a market study by WSU MBA students. In addition, working with a local multi-media company, PNNL assisted in developing an internet presence for Knovation.

Spencer Technology – Spencer Technology, formerly based in Redmond, recently relocated to the Tri-Cities Enterprise Center in Richland. PNNL led the recruiting of Spencer Technology over a period of several years. Spencer Technology developed and manufactures metal matrix composite (MMC) rims for bicycles of serious riders. The MMC rims are stronger than conventional rims, and they are three times as brake-wear-resistant (typically the limiting factor in rim life). In addition to recruiting Spencer Technology, PNNL provided technical assistance in MMC technology.

USA Referral – USA Referral recruits and trains sales representatives to market prepaid phone cards for Mundo Communications Network. USA referral operates out of a call center located in Richland, although many of its sales associates work from their homes in the mid-Columbia region. Using primarily telephone contacts, USA Referral sells phone cards throughout the U.S. To track sales leads and card sales, USA Referral needed computer equipment, which PNNL provided from excess.

XL Sci-Tech (spheres) – XL Sci-Tech, owned by a staff member formerly on entrepreneurial leave, initially worked on developing bioabsorbable glass for use in prosthetics. While the prosthetics development efforts continue under several Phase 1 and 2 SBIR grants, XL Sci-Tech is also working on a new product line. The new product line, for which XL Sci-Tech has also received SBIR Phase 2 funding, is glass spheres that can be used to deliver certain therapeutic chemicals. PNNL assisted XL Sci-Tech with technical assistance and business assistance, both directly and through consultants.

Objective 4.3: Battelle will serve the communities to further enhance the Laboratory's status as a valued corporate citizen of the Northwest region.

Results

Battelle staff were instrumental in launching Team Battelle in FY1999 in response to community comments that Battelle staff were not visible volunteers in the community. Hundreds of staff donated hundreds of hours in support of 36 Team Battelle volunteer programs. This far exceeded participation in 10 volunteer programs established as the target for this inaugural year.

To further understand the needs of the local minority community, a series of focus groups were held. The results were summarized in Battelle's Minority Community Relations Report and Action Plan. The action plan was developed to implement the recommendations of the report. Actions identified in the Actions Plan will be tracked via the self-assessment process.

Finally, to bring the capabilities of the Pacific Northwest National Laboratory to the attention of state opinion leaders and government officials, a pilot campaign was launched aimed at state opinion leaders with the intention of increasing PNNL name recognition as a leader in the Washington biotechnology industry. In support of this indicator, a number of significant activities were undertaken in FY1999 resulting in, among other activities, the Governor's Office request for PNNL assistance in the State Salmon Recovery Program, PNNL participation in the Joint Seattle-Spokane Leadership Conference, the presentation of DOE-sponsored agriculture, biotechnology and Clean Production activities to the APEC Industrial Science & Technology Working Group, and PNNL

staff participation with the governor on the Washington State Mission to Mexico, representing DOE efforts in biotechnology, environment, energy, and climate change.

Based upon our progress toward the performance indicators that provide the evidence of achieving this objective, our rating for FY1999 is **Outstanding**.

Analysis

Successful deployment of a community volunteerism program. Battelle staff have long been significant volunteer contributors of their time and energies to the local and regional causes that appeal to them. Most of these efforts however, have been unrecognized because the volunteers have given of themselves, not as a part of any organized group. This became evident as a recurring theme of a 1998 survey of the local community.

In support of this indicator, and in response to the 1998 Community Survey, Battelle launched Team Battelle, a program originally started at Battelle – Columbus, within PNNL. FY1999 saw the launch of Team Battelle with outstanding success. To support the program, we developed a 10-member advisory committee. This committee meets monthly to review proposed volunteer projects, and to recognize and reward staff for their volunteer efforts. To communicate the scope and successes of Team Battelle to all staff, we have established and maintained a constant stream of volunteer project information through electronic and print media including *Inside PNNL*, *Battelle World* and the new *TeamWorks* newsletter.

Team Battelle's inaugural year at PNNL was launched with resounding success. Against our target of 10 volunteer projects initiated, Battelle staff volunteered support for 36 different programs. Examples of programs supported by Battelle volunteers in FY1999 include: Earth Day, Car Seat Safety Checks, Children's Center Landscaping, the Domestic Violence Clothing Drive, Baseball in Slavutych, the Special Olympics, construction of the Playground of Dreams located in Columbia Park.

To get the word out into the local community that Battelle staff are available to help, members of the Advisory Committee have established contact with key community agencies. These contacts were instrumental at launching several key support programs in FY1999 and have resulted in a number of local agencies calling Team Battelle asking for assistance.

Conduct focus groups with selected community leaders and develop a subsequent action plan that specifically addresses a proactive approach to enhance opportunities for the minority population within the Tri-Cities and greater community. The need to conduct a series of focus groups within the community developed as a result of the 1998 Community Survey. One of four recurring themes of the Survey was summarized in the statement that "Battelle's/PNNL's linkages with diversity efforts and the minority community were extremely weak." Actions were taken during 1998 to address the immediate issues of diversity, but more information was believed to be needed to understand the needs of the minority community.

To gather additional understanding about the needs of the minority community, a series of focus groups were held. The results were summarized in Battelle's Minority Community Relations Report and Action Plan. The action plan was developed to implement the recommendations of the report. Actions identified in the Actions Plan will be tracked via the self-assessment process and monitored by the Community Relations Advisory Committee. A Minority Community Relations Advisory Committee was formed to serve as a conduit for information among, and between, the minority

communities and Battelle. Minority community response to the formation of the Advisory Committee has been significantly positive.

Successful deployment of a campaign to increase awareness of Lab capabilities applicable to issues and industries of regional significance. The 1998 Community Survey showed that Battelle and PNNL are well known and respected in the local community. Older surveys however indicated limited national name recognition, but no data exists to support regional recognition in the Pacific Northwest.

To facilitate the top-of-mind awareness desired for the capabilities of the Pacific Northwest National Laboratory, a pilot campaign was launched aimed at state opinion leaders. Specifically, we intended to increase name recognition for, and positive awareness of, the Laboratory as a leader in the Washington biotechnology industry. In support of this indicator, a number of significant activities were undertaken in FY1999.

As a result of our successful involvement in BIO '99, as well as other laboratory initiatives, a number of significant events occurred:

- PNNL's Natural Resources Initiative led to the Washington State Governor's Office request for PNNL assistance in the State Salmon Recovery Program, including consideration of water and energy issues.
- PNNL participation was incorporated into the Joint Seattle-Spokane Leadership Conference, held in early October, involving state government and industry leaders considering technology, workforce and trade challenges for the 21st Century.
- PNNL presented U.S. DOE-sponsored agriculture, biotechnology and Clean Production activities to the APEC Industrial Science & Technology Working Group hosted by the U.S.A. in Seattle, and led by the Department of Commerce, EPA and the State Department. Twenty (20) Pacific Rim nations participated with key U.S. and Pacific Northwest businesses.
- PNNL efforts were successful at incorporating science & technology topics into the Washington State House Agriculture & Ecology Committee tour of the Hanford Site.
- PNNL staff participated with the governor on the Washington State Mission to Mexico, representing DOE efforts in biotechnology, environment, energy, and climate change. Discussion involved the president of Mexico, Mexican government cabinet officials and the 100 person Washington state delegation.
- PNNL staff assisted the governor's office and key cabinet staff in the "Capital for a Day" program in the Tri-Cities on July 20 and 21 and were successful at including economic development, natural resources, agriculture and telecommunications connectivity in the discussion agendas.
- PNNL staff also worked with the Seattle Host Organization (SHO) on a number of relevant U.S. DOE efforts for the Fall 1999 World Trade Organization meeting to be held in Seattle.

Community Relations Performance Evaluation

The overall performance rating for this Critical Outcome is determined by comparing the total value in the following table to the rating scale at bottom.

Table 4.1 - Community Relations Critical Outcome Performance Rating Development

Element	Performance Level	Effectiveness Score	Value Points	Weight Points	Weighted
4.0 Community Relations					
4.1 Battelle will continue/establish partnerships with local & regional organizations to enhance science, mathematics and technology education reform in schools					
4.1.1 The impact of Laboratory-sponsored programs for teachers of science, mathematics, and tech. education in partner school districts	90.5	100			
	Obj 4.1 Total	100	5.0	15%	0.8
4.2 Battelle will put technology to work in the Tri-Cities and Pacific Northwest to create and sustain a diversified and strong economy					
4.2.1 The number of local firms for which tech. assistance is initiated each year.	61	50			
4.2.2 Survey of local firms on the value of PNNL technical assistance	90%	30			
4.2.3 The number of new businesses started, or expanded, in the area.	10	100			
	Obj 4.2 Total	180	5.0	50%	2.5
4.3 Battelle will serve the communities to further enhance the Laboratory's status as a valued corporate citizen of the NW region					
4.3.1 Successfully deploy a community volunteerism program	8 pts.	80			
4.3.2 Battelle will conduct focus group meetings . . . and develop a subsequent action plan that addresses . . . the minority population within the Tri-Cities and greater community.	10 pts.	50			
4.3.3 Successful deployment of campaigns to increase awareness of Laboratory capabilities . . . of regional significance	9 pts.	85			
	Obj 4.3 Total	215	4.8	35%	1,7
				Total	5.0

Table 4.2 - Community Relations Critical Outcome Final Rating

Total Score	5.0 - 4.5	4.4 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 1.0
Final Rating	**Outstanding**	Excellent	Good	Marginal	Unsatisfactory

5.0 Determining the Laboratory's FY1999 Performance Rating

Battelle's performance rating for FY1999 is determined by determining the year-end performance for each performance indicator and plotting the performance in the corresponding Contingency Diagram found in the appropriate section of the FY1999 Battelle Performance Evaluation and Fee Agreement. Each year-end score results in an Effectiveness Score. The sum of the Effectiveness Scores fort each Objective are rolled up at the Objective level and the corresponding scores of the Objectives are rolled up to the Critical Outcome level to determine the adjectival rating for each Critical Outcome.

The summary Critical Outcome adjectival ratings are transferred to Table 5.1, below, also found on Page 4 of the FY1999 Battelle Performance Evaluation and Fee Agreement, and the adjectives are converted to a numeric score, which is weighted and summed to get the overall numeric score for FY1999. The numeric score is then converted to a final adjectival rating using Table 5.2, below.

Table 5.1. FY 1999 Contractor Evaluation Score Calculation

Critical Outcome	Adjectival Rating	Score	Weight	Weighted Score
Scientific and Technological Excellence	Outstanding	4.8	55%	2.6
Operational Excellence	Outstanding	4.5	20%	0.9
Leadership & Management	Outstanding	4.5	20%	0.9
Community Relations	Outstanding	5.0	5%	0.3
			Total	**4.7**

Table 5.2. Overall Contractor Adjectival Rating Scale

Total Score	5.0 - 4.5	4.4 - 3.5	3.4 - 2.5	2.4 – 1.5	<1.5
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

Part II

Developing a Consolidated Laboratory-level Position on Key Vulnerabilities Using Assessment Results from FY1999 Activities—Final Report

Overview

Four years ago, the Pacific Northwest National Laboratory adopted an ordered assessment process to improve performance feedback in work processes and systems and ensure environmental safety & health and organizational objectives are met. This assessment process was formally identified as the Integrated Assessment (IA) management system with objectives of:

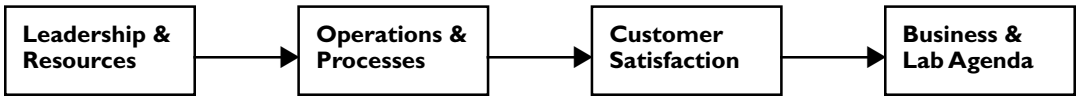
- Providing the Laboratory and Department of Energy (DOE) staff and line management accurate technical, business and operational performance information that promotes early identification and resolution of problems that may impact achievement of the Laboratory critical outcomes, division/product line objectives, and directorate/management system objectives.
- Verifying conformance to established requirements.
- Verifying effective conduct of activities (expected by DOE and the Laboratory senior management) to protect the environment and the health and safety of workers and the public.
- Identifying attributes that lead to superior performance and shared learnings.
- Driving ongoing improvements to performance.

As the IA management system gained maturity and in response to gaps found in evaluating assessment results, it became apparent that there was no systematic mechanism to identify lab-level issues or areas of vulnerability. This year a solution was proposed to gather a team of key Level 2s across the Laboratory to "distill" a set of Lab-level emerging risks and vulnerabilities from the following types of assessments:

- External oversight results
- Division/Directorate identified opportunities for improvement from their self-assessment activities
- A summarization of the IA management system activities encompassing; self-assessment evaluations, independent oversight activities, internal audit activities, and formal peer review results
- Critical Outcome results

The team met for seven hours over a period of one week in October 1999, with the understanding that the outcome of this process would be a product that will improve in clarity and focus each year it is conducted. The teams' objective was to "develop a set of issues for the Laboratory Leadership Team in the form of risks/vulnerabilities". The team stated that these issues must be validated and discussed with more scrutiny.

A suggestion was made to categorize the risks and vulnerabilities in a cause-and-effect relationship framework that recognizes that causal factors lead to achievement of positive business results. This framework and associated elements are as follows:



Any modifications for improvements to issues must be made within the framework of its life cycle cost, its cost/benefit, and its impact as a system. A process similar to that used earlier by Battelle (the ACE Process) should be used to evaluate proposed solutions to any issue considered.

Constraints within any of the elements will ultimately impact the achievement of business results.

Today's challenges requires that Pacific Northwest configure its strategy, technology, systems, and routines into a thematic, synergistic whole. It is this complex configuration among the parts that is most vulnerable. Below are four areas the team identified as issues, any solution considered must be viewed in light of its life cycle cost, its cost/benefit, and its impact of the system:

Systems Approach to Resource Management

Resources include facilities, space, the infrastructure, equipment and staff. All should be planned and management decisions made as a system. E.g., building and the computing infrastructure are both components of our resource. Decisions on the financial support to these components are generally made on an individual basis. The lack of a systems approach can lead to sub-optimization.

Staff Development, Recruitment, and Retention

Offering the maximum flexibility in pursuing career paths within BMI. Ensure that staff have realistic and challenging career development plans and that succession plans be maintained. Ensuring that the strategic staffing needs are projected and are a consideration in hiring decisions. These should address the overall lab considerations not just a specific business area. More lateral assignments and reinstitution of the rotation program for entry level S&Es should be considered. Follow-up of QWL survey issues, however, other ways (other than the QWL survey) to measure staff interests and satisfaction should be explored.

SBMS

There is an expectation that the laboratory will operate in full compliance with DOE Orders, Executive Orders, EPA requirements, etc; it is expected that these be noted within the requirements in SBMS. SBMS has grown since it was first implemented and changes have occurred in many of the subject areas. A systems approach to SBMS and the management systems requirements delivered through SBMS is needed. Extraneous material within SBMS should be removed. The SBMS system is not user friendly. IOPS was developed in part as a portal to SBMS within EMSL to help the scientist/engineer at the benchtop to understand the requirements that applied to the work being conducted. Consideration should be given to the needs of others (e.g., TGMs, PLMs,) and additional portals or navigation tools developed where needed. Not all tools will fit all businesses - for example, IOPS does not fit all directorate needs and its implementation should be considered in light of its cost/benefit to the scientist.

Although probably most of the requirements in SBMS are externally generated (some, like the requirement for PMPs are internally generated) the specific procedures are not. There needs to be a continuing review by all management systems, including soliciting input from those who have to implement the procedures and comply with the requirements, to continually enhance value (benefit to cost). Proposed changes to SBMS should undergo life cycle cost analysis (considering mortgages and costs to others) prior to implementation.

Information Protection

Information includes client provided information and PNNL generated information. Client provided information has National security aspects and proprietary aspects. PNNL generated information has these two characteristics as well as business strategy information. Protection of the information should be addressed from a systems viewpoint considering DOE S&S requirements, sensitivities of industrial customers, staffing strategy, work location, work assignment, computing infrastructure (including internet), and the laboratory agenda. A systems approach looking at the costs/impacts/benefits of different approaches to information protection considering all of these factors is needed.

It is expected that the Leadership Team will identify owners for each of the four issues presented herein. These issues will be revisited annually to assess progress and improve the clarity/specificity of the impacts to the Laboratory.

Part III

Summary of FY1999 Operations Improvement Initiatives

FY1999 Operations Improvement Initiatives

The Laboratory continues to mature in its approach toward continuous improvement. The set of FY1999 operational improvement initiatives was developed as an integral part of the planning process using information generated through the Integrated Assessment Program. The initiatives, briefly described below, were selected and approved by the Laboratory Leadership Team based on their potential impact on Laboratory objectives and performance. Each of the initiatives has a Level-1 sponsor and a project manager. The project manager develops a project plan, implements the plan, and reports progress on a monthly basis. The initiative sponsor provides guidance and leadership to the project manager and project team and reports status to the Leadership team at least once during the year.

Export integrated operations "IOPS" to other facilities within the lab

Objectives:

This initiative was a continuation of the FY1998 project that exported the EMSL Operations (now referred to as "IOPs") concept and tools to 4 new buildings including the Radiochemical Processing Laboratory (RPL - 325 Building) and the Life Sciences Laboratory (331 Building). Note that IOPS played a major role in the recent validation of the laboratory's Integrated Safety Management Program.

Results/Benefits

- Demonstrated the ability to implement IOPs in facilities with occupants from more than one division
- Developed and implemented the Map Information Tool (MIT).

Replace the Financial Processing System (FPS)

The PHMC contractors are migrating off of the Hanford Enterprise Server (ES). The costs to run PNNL's FPS application on the ES are going to quadruple in the next two years to over $450K per year and the service level will be reduced. To address this issue, this initiative replaced the general ledger, project accounting, service center, and cost closing processes which currently run on the Hanford Enterprise Server managed by Lockheed/Martin. All feeder systems were redirected through an enhanced accounting transaction edit system to the new FPS. Reporting and data transfers to other systems are now accomplished via PNNL's data warehouse infrastructure. In addition to avoiding the more than $300K per year cost increase, this initiative also provides project managers and business model stewards with more timely and accurate cost information. The new system became operational 6/99 and the old FPS system was retired soon thereafter.

Benefits

- Replaced the Lab's mainframe based finance system with a new system using state of the art technology. This will save the Lab approximately $250k per year in mainframe processing costs, and cut the processing cycle time by more than half.
- Instituted weekly financial processing. Weekly processing gives project managers and business managers a more up-to-date view of the cost status of projects and the business operations of the Lab.

- Implemented new fiscal year-end and start up procedures. Daily processing for the last week of the year enabled product line and business managers to better manage their projects, overhead pools, and variances. FY 1999 close out processing is being done in a separate database which eliminates the old "lock out" period so central accounting and field staff can begin setting up the new fiscal year two weeks earlier than in the past.
- Replaced the mainframe based service center system. The new architecture will enable greater flexibility in entering service center tickets and management of the service centers.
- Developed a new Manual Accounting Transaction system, which integrates invalids, cost corrections, and manual accounting entries into one system. This will reduce system maintenance costs and reduce the time central and field staff spends managing transactions. This system also lays the foundation for paperless cost corrections and journal entries.
- The FPS Team responded quickly and effectively to DOE's year 2000 compliance requirements. The team designed and constructed the new FPS with Y2K issues in mind and they rearranged the project schedule to perform Y2K testing earlier than planned. As a result, DOE was able to include FPS in its list of mission essential systems which met the compliance stretch goal.

Improve Leadership Training and Development

The Leadership Initiative resulted in the development and implementation of an integrated leadership training and development program that benefits both management and staff members. The program consists of formal training, skill development, succession planning for key positions and developmental experiences through rotations, special assignments and action learning forums. This was an ongoing initiative. FY1998 efforts were focused in four main areas; Data Collection, Validation and Benchmarking, Program Design and Program Implementation. Training was provided to 92 staff with highly favorable ratings from the participants.

Benefits

The specific benefits to the lab included:

- Providing opportunities for management to network with their peers across the Lab
- Helping Managers learn and discuss Laboratory strategies, internal policies and processes
- Providing opportunities for management to engage in an open dialogue with PNNL's senior management
- Increasing the Laboratory's core management capabilities
- Providing information on management's skill gaps which enabled us to further develop training programs to meet the needs of current managers

In FY2000, the program will be included as part of the core services that the HR Directorate provides to PNNL.

Address Y2K Issue / Y2K Continuity Planning

Many computers and software programs (both commercial and PNNL created) cannot handle dates beginning in the year 2000. This could severely impact efficiency and effectiveness. This initiative

continued to provide lab-level support and coordination regarding PNNL efforts to minimize the impact and potential liability of Year 2000 issues for the Lab and BMI. Key activities included:

- Providing Y2k remediation, IV&V and end-to-end testing guidance. Developing evaluation documents, providing guidance and consulting support to help owners of DOE/PNNL mission essential systems to meet DOE HQ stretch assignment goals. Early and continuing efforts by Y2k team and key PNNL personnel, along with remediation of mission essential systems up to two months early, allowed PNNL to meet the DOE stretch goals. This resulted in the distribution of $39,800 in special incentive awards to approximately 150 PNNL staff members for their contributing to PNNL's success.

- Working directly with key site, BMI, and PNNL staff in the development of Contingency and Y2K Business Continuity documents in direct support of PNNL, Hanford Site, and BMI needs. Resulting in the successful meeting of PNNL, Hanford Site, BMI and DOE established milestones.

- Reporting Y2k status to support PNNL Management and weekly mandatory tracking and reporting of DOE/PNNL Mission Critical systems to DOE RL, DOE - HQ and other government agencies as requested.

- Working directly with external and internal review teams to reduce impact time to the field. External agencies include; DOE-HQ-ER, DOE-HQ-HR, OIG, NRC and DNFSB. Support and work with PNNL auditors and BCO review team.

- Providing a single, primary Y2k point of contact for Y2k issues which has allowed PNNL to maintain a focus and consistent information sharing on dealing with DOE issues which has minimized impact to PNNL field personnel and maintained consistent communications between DOE and PNNL

- Continued Y2k Information sharing to improve Y2k understanding through presentations at DOE and EFCOG conferences, training sessions, PNNL Y2K Web Site, presentations to PNNL directorates and divisions, other DOE Laboratories, and DOE HQ. These efforts have also helped to continue to increase staff awareness.

- Providing guidance and processes related to meeting DOE mandates on configuration management, transition planning, records management. Started and continue to work with F&O in preparing a PNNL Y2K response center for transition.

Benefits:

Met or exceeded milestones and deliverables for following:

- BMI mandate to perform Y2k reassessment of 1831 projects for litigation including establishing central record management of supporting documentation. This will help to minimize the potential liability impact related to 1831 Y2k issues for the lab in the future.

- DOE HQ mission essential implementation (2 months early). This effort help DOE improve their Y2k position to OMB and receive a B" rating.

- DOE HQ IV&V for mission essential systems and infrastructure

- DOE HQ End-to-End Testing for mission essential systems

- DOE HQ Contingency Planning for mission essential and infrastructure
- DOE HQ and BMI Y2K Business Continuity Planning.

This OIP activity has helped PNNL maintain a world class commitment to DOE with regard to addressing Y2K issues within PNNL and its clients and show due diligence has been applied related to 1831projects. The project is planned and funded at a reduced level to continue until the early part of the third quarter in FY 2000.

Develop Project Management Plan (PMP) Generator

This project was completed in September and resulted in the development of a tool intended to assist Project Managers with the preparation of a Project Management Plan. Known as the PMP Generator, it allows Project Managers to create a "tailored" PMP using project specific information from the Electronic Prep and Risk System. It also linked the Electronic Prep and Risk System with PNNL's "Requirements for Project Management" training course. These tasks were developed by a working group in response to a self-assessment review performed by the Project Management System during fiscal year 1998. The U.S. Department of Energy's Integrated Safety Management Review Team and PNNL's Operations Managers made similar observations that support the self-assessment's findings.

Benefits

This initiative provided the following benefits to PNNL:

- Increased awareness of PNNL requirements for managing projects. An updated CBT Module on Project Management requirements is now accessible through EPR with a notification provided if the PM, as indicated in EPR, has not had the training.
- Improved project planning via the new PM generator that creates a "tailored" PMP template and checklists by clicking a button in EPR. Relevant information is automatically copied from EPR into the PMP in a recommended and annotated format along with checklists and references.
- Better communication among the PM, PLM and other key project staff via the ability to electronically attach and view documents such as the PMP, SOW, and Cost Sheets in EPR.

Upgrade travel system

This initiative is part of the BMI OD Strategy Project. PNNL partnered with BCO to implement a new commercial off the shelf software (COTS) system that utilized current web base technology to support the functional travel management needs of BCO and PNNL into the next millennium. The new travel system was implemented in 8/99 and is Y2K compliant.

Benefits

- Reduced operating costs by an estimated $75K/year
- Direct payment to American Express, audit on exceptions only, reduced receipt requirement base on credit card feed, and electronic routing for approvals
- Improved accuracy and reduced cycle time with on-line entry, routing, and submission of travel expense reports
- Provide on-line status of travel report and cost information.

PNNL Security Review

The Pacific Northwest National Laboratory has experienced an unacceptable number of security infractions related to working with classified information during the past two years. This trend of security infractions is clearly not the performance the Laboratory expects or desires. Past infractions have been primarily addressed on an organizational level. This initiative was intended to take a systemic look at this issue and to develop and implement recommendations that need to be addressed at a Laboratory level.

Benefits

- Increased security awareness at the Laboratory
- Increased the awareness concerning security training, >99% of PNNL staff are current with security training
- Assisted in the development of the Integrated Safeguards and Security Management System Program Description
- Identified security points-of-contacts for each Level 1 organization
- Influenced the development of a Stragegic Plan for classified work
- Influenced the development of a threat briefing that was provided to all Level 1s

Chemical Management System – Constituent Tracking Enhancement

This two-year project will provide the ability to maintain and report constituents for chemical products in inventory at PNNL. Constituents data is required to comply with Environmental Air Release Standards as well as other environment, safety and health regulations. The project was developed by a working group in response to a self-assessment review and documented improvement initiative performed in fiscal year 1999. The U.S. Department of Energy's Integrated Safety Management Review Team and PNNL's Operations Managers made similar observations that support these findings. Good progress was made in FY99 including about two thirds of the chemical constituent upgrade for CMS. Design and programming are nearly complete, and testing should start in October of 1999.

Benefits

Expected benefits include:

- Improved compliance with EPCRA.
- Improved compliance with Environmental Air Release standards.
- Improved accuracy of chemical inventory data for emergency response.
- Provide accurate data for Facility Use Agreements.
- Successful closure of several key open issues related to the recent CMS Improvement Initiative.
- Increased marketability of CMS through its licensed distributor Enabling Technologies, Inc.

Electronic Records and Information Capture Architecture (ERICA)

This was the first phase of a two year initiative to implement a new records and scientific and technical information (STI) system. This new system (ERICA) will integrate and link critical STI and Records databases and repositories that exist at the workstation level in organizations throughout the Laboratory. The ERICA system will integrate the STI and records databases and repositories currently being created and managed at the individual workstation and laboratory level by staff in Communications, Quality, Contracts, and the R&D organizations. ERICA will support PNNL and client requirements to:

- capture scientific and technical information for easy sharing and reuse internally and enable appropriate client and public access externally.
- enhance records management tools; archive electronic records electronically
- streamline the information release process
- provide electronic publishing and document management capabilities that meet DOE requirements
- upload metadata fields to DOE to serve as required announcement reports
- provide metadata and full-text search capabilities for staff against the Lab's repository of electronic records and STI (not funded for FY1999)
- automate and integrate scientific and technical information peer review (routing and signature) processes (not funded for FY1999)

Major accomplishments through October 1, 1999 include the following. (Note that additional results/benefits will come after complete implementation in FY2000):

- Installed both production and development servers for the ERICA project with the OS and network configurations; installed TRIM software; defined initial security; database setup in the development environment; and installed and trained Record Specialist on TRIM and Ascent Capture Scanning tools.
- Information Release process (entry and approval) has been implemented in the production environment.
- Completed Phase I OSTI Announcement testing and batch processing. Phase II OSTI testing is progressing with the inclusion of the work authorization number.
- Rolled out the new IR entry form and system to the PM2 users. Implemented several changes to the IR system to reflect user needs.
- ERICA Lab Leadership Team presentation: Primary issues were related to the mosaic effect (e.g., information that was once only accessed or view singly, that now may be view in a consolidated manner, may give new insights and/or perspectives based on a consolidated view) and the potential security issues that could occur. Discussed possibilities for collaboration for Information Visualization with the Lab LDRD. It was determined the visualization tool is not yet at a point to pursue this activity for the Lab.
- Recommended not to pursue user pay strategy for ERICA.

Benefits

The following major benefits/cost savings for FY1999 have occurred in the Laboratory, based on the activities of this initiative:

- The need for University Relations to collect and track research collaborations and joint publications with universities manually will be eliminated.
- Reporting of scientific and technical data related to peer-reviewed journal articles can be done via reporting from PM2, and the laborious process used by the Hanford Technical Library to perform searches will be eliminated.
- Approximately 15 electronically automated (and up-to-date) external PNNL publication sites (e.g., by people, document type, keyword, organization, and facility usage) will be made available, saving hundreds of manual technical editor and staff review hours to create in FY2000.
- For EMSL seminar and speaker tracking, along with automated announcements to staff have already saved $ 23K in soft savings for FY1999.
- Eliminated the need for collaborators to have an HID, saving approximately 3 hours of communication, e-mail, people tracking, calls to the collaboration, and maintenance of the HID table per collaborator. We have already saved 186 HID creations resulting in (558 hours saved so far this year).
- All R&D divisions began using ERICA and the new IR process this year. The new Information Release process and this has already resulted in a cost savings to the Laboratory of: $20K (soft savings) for the Lab this year and the projection for FY00 is $138K.
- Received approval on the ERICA CM process that has saved $15K this FY.

Integrate the Electronic Prep and Risk (EPR) and the Contract and Proposal (PCIS) systems

The project was successfully completed in Mid August integrating the EPR and PCIS systems.

Benefits

The enhancements have led to the following benefits to PNNL and BMI:

- Integrated all three systems, EPR, PCIS and the BMI Scope System, ensuring consistent data
- Eliminated the cost, hassle, and errors associated with duplicate data entry in EPR and PCIS
- Ensured that all new projects have signed prep & risk forms and have formally filed scope before setting up funded projects in the PNNL PCIS/Financial system, which should enable PNNL to better manage risk
- Met all the new BMI scope filing requirements for projects, which should improve BMI's and PNNL's ability to identify potential conflicts of interest
- Cleaned up some erroneous existing data in EPR and PCIS and added new validation checks in EPR to improve date integrity going forward.

Integrate databases/software to support business development/marketing

Several business development/marketing systems are currently in various stages of development within Battelle (e.g., BMI's capabilities website, LabCap, EMSL's document storage system and the Environmental Technology's CapMap). This initiative chartered a cross-cutting team to document the laboratory needs with regard to business development tools. The team conducted an independent review of the various systems to recommend the most cost-effective and efficient way to integrate, consolidate, and enhance these systems to better support the needs of the lab. The goal is to recommend and eventually implement on a lab-wide basis a system that will enable staff to spend more time on the creative part of marketing and business development and less time trying to find data. The project was successfully completed in September with the publication of the final report.

Benefits

The research and survey used to gather the report contents and the associated dialog with a cross section of PNNL management and staff have produced the following benefits:

- Identification of a system owner for the Business Development Management System. In FY2000, this owner will further define the scope of this management system.
- A detailed summary of the many systems that now hold business development related information.
- A comprehensive summary of staff's expectations of what a business development information system should be able to do.
- A plan to create a coordinated business development information center to provide best practices in proposal development and act as an information exchange center about PNNL capabilities, projects and clients.

The combination of the business management system, leadership, and summary of what the divisions are doing and what they want in a unified business development information center will, if implemented, increase the efficiency of PNNL's proposal processes.

Implement Battelle-wide payroll system at PNNL

This Initiative implemented a BMI-wide payroll and benefits administration system that is fully integrated with the human resources, benefits administration information systems. The project was completed on schedule and under budget.

Benefits

- Improved ability to manage and transfer staff across components.
- Improved accuracy and timeliness of information by eliminating dual data entry and improved editing of data.
- Reduced the cost of operations and maintenance ($50K per year less).

PNNL Family Day

This initiative implemented the hosting of a PNNL Family Day on September 11, 1999. This event was held in September giving all staff members and their families the opportunity to see some of the exciting work going on across the Lab. Displays and demonstrations were set up to

communicate the mission and objectives of each organization. Examples of these included hands-on science games set up in a conference rooms and poster displays demonstrating new technologies or products.

Benefits

Benefits to PNNL of this initiative included:

- Enhanced staff morale
- Validated PNNL's position as a family-oriented employer
- Reinforced PNNL's reputation as a good community citizen.

Electronic Commerce Task Force

The project encompassed identification of current e-commerce activities now taking place in PNNL and of potential hardware/software infrastructure requirements for IS&E planing/budgeting purposes. It included develoment of an educational curiculum focused on Product Line Managers, metrics, and guidance and requirements for conducting e-commerce (SBMS). The scope of electronic commerce is currently defined as "Internet-based transactions in which the Laboratory's products and/or services are offered for some consideration, creating mutual expectations." It is not limited to transactions involving payment.

- Increased PNNL staff and Leadership Team (LT) understanding of the potential for business development using electronic commerce tools and how to manage the potential risk
- Created interest and subsequently involved Battelle senior management
- Identified and briefed the LT on current e-commerce activities at PNNL, which heightened interest in information security issues, as well as the potential of doing business on the web
- Developed infrastructure core requirements for PNNL and provided information to IT for planning and budgeting purposes, allowing an orderly transition into the electronic commerce arena
- Identified management systems and subject areas affected by electronic commerce requirements, which lays the basis for providing guidance within the Lab
- Ensured that the Task Force maintained a BMI-focus under Mike Schwenk's guidance; expanded task force membership to include additional Battelle staff (total of four from BCO)
- Developed a basis for assessing and managing the complexity of cross-BMI integration in electronic commerce. Due to the this complexity, the following tasks are not complete
  - Publish SBMS subject area content
  - Develop educational curriculum and metrics
  - Complete BMI infrastructure recommendations.

REX Rehost Activity

The major objective of this two-year Hanford Site-wide project is a redevelopment / re-hosting effort to provide a highly cost effective environment to support the efforts of the radiological records program. The environment must support current requirements as well as accommodate future needs

with minimal impact, to the maximum extent possible. Due to the current cost of operation, the new system will be tested, data migrated, and available for production use by October 1, 2000. Good progress was made in FY1999 including some initial hardware/software installation and development.

IVDTS Phone System

As a result of an audit performed by the Inspector General's office, it has been recommended that PNNL remove the Battelle private telephone system and use the Hanford site IVDTS telephone system. The reasoning is that excess capacity, within the IVDTS, could be utilized by placing PNNL on the IVDTS system, reducing costs to all IVDTS users by spreading cost recovery across a larger user base. This has raised several questions about PNNL's functional requirements and the cost involved to extend the IVDTS to the Battelle buildings. The purpose of this project was to determine the feasibility, cost, and schedule required to replace the Battelle private telephone system and extend the Hanford IVDTS phone system to the Battelle private buildings. The work also addressed PNNL's current and strategic functional requirements and how the IVDTS will meet those requirements.

FDH provided a written response to PNNL's specifications originally submitted to DOE-RL March 30, 1999 and further reviewed in the June 1-2, 1999 PNNL Telephone Functional Requirements workshop. The response included functional requirement descriptions, financial requirement description, and a detailed engineering response addressing related issues identified during the workshop.

Subsequent analysis by the ComGroup consultant determined that the August 1999 FDH response had more accurately characterized the construction/integration costs and functionality than the first proposal of July 30, 1998. Not all functional requirements were fully addressed, however. Although response to some requirements were incomplete, there was enough information to estimate life cycle costs and determine overall functionality compliance.

The analysis concluded that life cycle costs were higher than the PNNL-proposed alternative and that not all functional requirements were met by FDH's proposed IVDTS consolidation approach.

Using information from PNNL's analysis, the FDH proposal, and on-site interviews, DOE-RL's Contract Finance and Review Division prepared a draft report, Analysis of Potential Benefit from Consolidation of the PNNL and IVDTS Telecommunications Systems (PAR 99-321-10), dated September 30, 1999. The report recommended PNNL's existing IBX telephone services not be consolidated into the Hanford IVDTS telephone system. As of October 13, a final RL management decision had not been made. Although RL staff have indicated approval of the IBX upgrade, we are uncertain when PNNL will be given the official approval to proceed.

Benefits

Benefits to the Laboratory is avoidance of $580K first-year operating cost and approximately $10.4M life cycle cost. Upgrading the existing IBX telephone system will also provide strategic alignment with Laboratory requirements to eventually integrate data network and telephony systems.

Part IV

Summary of FY 1999 External Oversight Activities

Battelle
Pacific Northwest National Laboratory
Independent Oversight Report

Review of Fiscal Year 1999 External Oversight Data

IO-99-20
October 20, 1999

Prepared by: (signature on original)
Richard J. Doyle Date
Independent Oversight Department

Approved by: (signature on original)
Jan Jaeger Date
Manager, Independent Oversight Department

Executive Summary

The Independent Oversight (IO) Program's primary charter is to identify performance and compliance issues within Pacific Northwest National Laboratory's (Pacific Northwest) operations and to manage the Pacific Northwest Price-Anderson Compliance Program.. The IO Department has an additional responsibility to review and analyze external oversight reports (e.g., U.S. Department of Energy [DOE] Headquarters; DOE Richland Operations Office [RL]; State of Washington, Department of Ecology; Defense Nuclear Facilities Safety Board; Battelle Columbus Operations) to identify Pacific Northwest-wide issues and trends and issues including issues that may require reporting under the Price-Anderson Amendments Act.

This report summarizes the results of the IO FY1999 review of external oversight data. It contains:

• A summary of external oversight reports,

• An overall analysis of these reports, and

• A summary of candidate Pacific Northwest-wide improvements.

Twenty-five (25) reports were reviewed and analyzed. Generally, external oversight reports for FY1999 indicate that Pacific Northwest overall performance is excellent with continued improvement in most areas. There are, however, areas where improvements are needed; the following are Laboratory-wide issues that have been identified in these reports as needing improvement.

Emergency Preparedness

- The level of awareness regarding emergency preparedness is generally inadequate and needs improvement. A procedure is needed to assure that emergency managers are familiar with and understand the Hanford Site Emergency Response Plan.
- Hazards surveys are weak in addressing hazards from outside the facility and drills are not being conducted for all identified hazards resulting in weaknesses in emergency response to drills and exercises.

Integrated ES&H Management

- Pacific Northwest has not ensured a fully integrated approach to job hazard analysis and work control processes, and additional improvements are needed in this area.
- The Laboratory continues to experience deficiencies in procedural compliance and weaknesses in implementation of PNNL work control processes. Senior management should take more aggressive action to enhance performance in the area of compliance to work planning and control procedures.
- The flow of hazard identification information generated via the Prep and Risk or the Facilities and Operations Service Request System to hazards analyses for bench level activities is not well coordinated, clearly understood by staff, or consistently implemented.

Performance Measurement/Self-Assessment

• Additional improvements are needed in several areas addressing self-assessment including: more detailed performance expectations and guidance for organizational self-assessment programs, consistent and complete implementation of the self assessment program and corrective action programs, ensuring the rigor and formality of self-assessments, strengthening the Integrated Assessment element of the Integrated Assessment Program to ensure validation of self assessment results, and linking the IAP with integrated planning.

• Pacific Northwest self assessment programs should address regulatory requirements, should improve analysis and reporting of regulatory non-compliances identified through Laboratory self-assessments, and should strengthen its analysis and reporting of programmatic and repetitive issues.

• Pacific Northwest's information technology internal controls are inadequate, due in part to the absence of monitoring activities of IT systems and controls by internal or external auditors. PNNL management has not demonstrated a commitment to establishing procedures to ensure company IT processes and activities are monitored on a regular basis.

• Rigorous self-assessment of the deployment of Pacific Northwest's Quality Program in radiological facilities, work, and activities should receive high priority, and quality assurance plans should be revised as necessary to ensure that the Laboratory is in full compliance with the Quality Rule.

Environmental Management

• Line managers need to plan and budget better for waste management and disposal.

• Waste streams held at PNNL with no defined disposal pathway were not included in the Solid Waste Information Forecast Tracking.

Requirements Management

• Procedural adherence and compliance is a recurring issue with management and staff. This includes lack of guidance on procedural development, implementing use requirements, and disciplinary issues for noncompliance (accountability) for staff and management. There seems to be a lack of strong management commitment to procedural adherence, and management leadership needs to improve to ensure adherence to procedures in conducting PNNL activities

• The implementation of the configuration management program is inconsistent and configuration management program documentation is lacking.

• The SBMS is a good system in principle, but lacking in implementation in many cases. There appears to be a need for general review of all components of the SBMS to determine which portions need to be revised and to set a budget and schedule to complete the necessary revisions.

Human Resources/Human Factors/Staff Competence

• The Lessons Learned program should be expanded and enhanced

Appendix A

Results of Peer Review

Results of FY1999 Peer Review

Contents

Results of Peer Review

I. Overview of the Peer Review Process

Peer review is one of the universally accepted methods to determine the direction and assess the quality of science, engineering and technology. As one of the Department of Energy's (DOE) national laboratories, the Pacific Northwest National Laboratory (PNNL) is committed to the principals and practices of peer review. PNNL's peer review process has both internal and external components.

Laboratory-initiated peer review has three primary components:

- The Division Review Committees (DRCs),
- The Laboratory Review Committee (LRC), and
- The internal peer review of communications sent by Laboratory personnel.

Each Laboratory Division has established a DRC to review its science, engineering, and technology portfolio, and the DRC chairs serve as members of the LRC. Both committees report to the Laboratory Director. Each of the above three components has been formalized and documented by publication in the Laboratory's Standards-Based Management System.

Major DOE programs (usually Office of Science) are reviewed annually by panels of subject matter experts brought to the Laboratory by sponsors of the research.

Finally, the Laboratory also establishes special ad hoc internal review committees to address specific submissions of proposals in response to request for proposals (RFPs) for major programs announced by Laboratory sponsors of research and development (usually DOE).

II. Scope of FY 1999 Submission

Included in this report are summaries of the (1) proceedings of the LRC, (2) proceedings of the DRCs, (3) results of DOE-initiated peer reviews, and (4) results of special ad hoc internal review committees.

III. Laboratory Review Committee

The Laboratory Review Committee met with Bill Madia and his Associate Laboratory Directors (or their representatives) on September 27, 1999. The Director presented an update of the Laboratory's strategic plan, and he also reviewed the role of peer review in the Laboratory together with his expectations for the LRC. Each of the DRC chairs met individually with their respective Associate Laboratory Director (ALD). All four DRC reports were shared with each LRC member. In addition, each of the Divisions' chairs (or their representative) presented a summary of the results of their review. This permitted the DRC chairs to share their perspectives with respect to review procedures, presentation formats, and cross cutting issues.

Cross cutting issues were identified during the LRC executive session and presented to the Director and the ALDs. The issues were:

- Division response to DRC recommendations. Each of the Chairs noted that the actions taken in response to the previous review were the first topics presented at this year's review. All agreed

that the response to DRC recommendations was first rate. It was noted that periodic feedback to the DRC during the year would be valuable and would help keep DRC members more engaged in the life of the Division they serve.

- Staff growth and recruiting. Each DRC noted the need for the Laboratory to grow, particularly in some areas. They noted the need for a proactive and efficient recruiting effort and specifically pointed out that DRC members were a tremendous source of potential candidates.
- Need for clarity regarding the balance of IP and Battelle proprietary issues and PNNL as a public institution. None of the LRC members were critical of efforts by DOE and the Laboratory to export technology to the private sector, but each wished to know how the process was accomplished. In response, Bill Madia provided the LRC with the details of the protocols regarding intellectual property.
- Self-assessment: Each LRC member requested that they be sent their respective Division's self-assessment.

IV. Division Review Committees

Division Review Committees for each of the Laboratory's four technical Divisions met during FY 1999. The results of these reviews and the prominent DRC recommendations are summarized below. Each Division is committed to addressing the recommendations during the next fiscal year.

Energy Division

Review Scope: The Division's DRC met June 9-10, 1999. The DRC assigned an overall rating of "Excellent" to the program components reviewed. Program components reviewed were (1) Energy and Engineering, (2) Information Sciences and Engineering (IS&E), and (3) Virtual Prototyping and Engineering Simulation Laboratory. Specific "Energy and Engineering" topics of the review included auto transportation, power systems, building systems, and carbon management. Specific "Information Sciences and Engineering" components reviewed were SAVI, information assurance and infrastructure protection, and collaborative problem solving environments.

General Comments: The ongoing projects all appear to address recognizable technical problems and areas in which the associated industries are being challenged and for which achievement of the Division's objectives would "represent significant value" to the associated commercial products and services. This year's review presented a "far stronger sense of organizational purpose", and the Division conveyed a "strong sense that the individual projects are part of a cohesive, well-planned enterprise."

Specific Comments: Within the Energy and Engineering programs:

- The transportation initiative has built significant momentum and is bringing a wide range of PNNL capabilities to bear on critical client problems.
- PNNL has the potential to contribute significantly in both power systems and intelligent buildings.
- Specific energy initiatives were all relevant and showed considerable innovative thought.
- The Carbon Management initiative is a remarkable effort that can provide a frame of reference for energy work.

For Information Sciences and Engineering, the reviewers found that:

- IS&E has demonstrated its ability to produce significant new technology and should be commended for its contributions.
- Significant work is taking place and the staff is motivated, highly capable, and pleased with their working conditions.

For the Virtual Prototyping and Engineering Lab, the reviewers found that:

- The project represents a significant opportunity for PNNL that will benefit from further refinement and development.
- PNNL has both the computational infrastructures as well as the engineering knowledge to offer an expert system to its customers.

Response to 1998 review: Review comments on individual projects were transmitted to the respective Principal Investigators for their consideration. The Division presentation included a summary of actions taken on 1998 review, and at the close out of this year's review, the DRC specifically commended the Division on the actions taken on the DRC recommendations.

By far the most important recommendation of the 1998 DRC was to take steps to remedy the observation that the connections between many of the projects were tenuous or non-existent. The DRC noted that this year the Division conveyed a strong sense that the individual projects were part of a cohesive well-planned enterprise.

Environmental and Health Sciences Division

Review scope: The review was held March 2-3, 1999. Components of the review included (1) the Computational Chemistry Program, (2) the Mass Spectrometry Program, and (3) the Atmospheric Chemistry Program.

General Comments: The DRC assigned overall ratings ranging from "Excellent" to "Outstanding" for the components reviewed. The DRC did not believe it had the appropriate expertise to provide a meaningful review of the global change program, particularly the computation and modeling components that were subjects of considerable discussion. In response, the Division sponsored a review on the Global Change Program held June 10-11, 1999. The results of that review were very gratifying and are summarized below under "*Response to 1998 review*."

Specific Comments: Component-specific comments are summarized below.

For the Computational Chemistry Program that utilizes a combination of computer science, applied mathematics, and environmental-focussed projects, the DRC found that:

- Highly parallel computer systems are very relevant for DOE support and are a suitable area for a great National Laboratory.
- The caliber of the staff and the facilities are first class, and the high quality of the technical presentations shows that PNNL has achieved a major goal of attracting highly capable scientists to this area of research.

- A truly impressive accomplishment is the fact that about half of the 700 visiting EMSL users were involved with the computing facility, a truly impressive accomplishment in the relatively short time since completion of the EMSL.

With respect to the Mass Spectrometry Program, the DRC found that:

- PNNL occupies a unique position in the DOE laboratory complex with respect to mass spectrometry in having a large high quality effort.
- The program is clearly internationally respected (and world renowned) in both isotopic and molecular-based spectrometry.
- The Laboratory is in a unique position to take a national leadership role in applications of mass spectrometry to biological problems, especially proteomics.

With respect to the Atmospheric Chemistry Program, the DRC found that:

- It has been recently energized and is a small but well focussed program.
- With the applied focus, it constitutes a vital national resource with strong synergy with the US Global Change Research Program.
- It has applications to accidental toxic chemical/biohazard release into the air.
- Management has to develop a strategy of why DOE should take on a larger effort with respect to other federal agencies.

EMSL: EMSL is "a state-of-the-art facility, extremely well constructed and equipped." The EMSL is unique in "the complement of instruments in close proximity and under one roof which can be used to study a single specimen." The potential exists for the EMSL concept to "produce outstanding results."

Response to 1998 review: The two most prominent DRC recommendations were (1) the Laboratory should consider strengthening fundamental science, and 2) the Division should commission an independent review of PNNL's global change program since the DRC did not believe that it had the appropriate expertise to address the issue.

In response to (1) above, the Laboratory has established two new LDRD initiatives in fundamental science, the Advanced Computational Science and Modeling Initiative and the Environmental Health Initiative. These two initiatives are the largest and most comprehensive components of the Laboratory's LDRD portfolio, and both build upon unique EMSL capabilities.

In response to (2) above, the Division added a new DRC member with global change expertise (James Kimpel), and he was commissioned to conduct a "Global Change Program Review" that was held June 10-11, 1999 in Washington, DC. The results of that review are summarized below. Members of the review team were world class scientists including Lord Meghnad Desai (London School of Economics), chair-James F. Kimpe (National Severe Storms Laboratory), Richard Somerville (Scripps Institution of Oceanography), Soroosh Sorooshian (University of Arizona), Bruce Stram (Enron Energy Services), and John Weyant (Stanford University).

The review panel was generally impressed with the quality and quantity of research performed under PNNL's Global Change Program. The panel noted that what is most remarkable is PNNL's

approach to ensure breadth in the program spanning a continuum which seeks to address important challenges spanning fundamental science issues through applied research into human and physical systems to activities directed towards policy-relevant opportunities.

The panel also acknowledged two crown jewels in the PNNL program, the Atmospheric Radiation Measurement (ARM) program and the Technology Strategy Project (policy work). The panel noted that the ARM program addresses the most important scientific issue in all of global change, the role of clouds in global climate modeling. The reviewers found that the policy work is vital to the DOE mission in that it may ultimately affect both national and international energy policies. The Technology Strategy Project is world class and is lead by one of only a few outstanding authorities in the field; this single project has changed national and international thinking on global climate change from an emissions problem to a concentration problem. This has major implications in potential mitigation strategies.

National Security Division

Review Scope: The review was held Jan. 13-15, 1999. Program components reviewed included: Safeguards & Security Product Line, Special Projects (classified), Medical Systems, and Chemical and Biological Defense.

General Comments: The DRC assigned an overall rating for the programs reviewed of "Excellent" to "Outstanding" and commended the Division on the obvious progress that has been made in developing a more explicit structure to the Division's activities. Management changes have been made which should serve to strengthen the Division. Attention must be paid to developing a tactical plan for daily and yearly operation. The Division should begin to devote more effort to identifying what the next major program may be in the future for DOE or DoD that would have a major science and technology content and for which NSD could be a major player.

Specific Comments: Since the review consisted of thirty-one presentations and posters, it is not possible to include here comments for individual projects. Project specific observations and recommendations have been shared with the Principal Investigators.

With respect to the Safeguards and Security Product Line, the DRC found that:

- The projects demonstrated sound technology and rational applications to specific issues.
- There were novel applications of several technologies and techniques to address a specific challenge.
- Work was unique and interesting and could serve as the foundation for collaborative research, implementation and deployment of tools for critical infrastructure protection and information assurance.
- The Product Line should develop a set of focussed technology objectives, and each project should have a clear relation to the objectives. It is highly desirable that the Product Line be recognized as more than a collection of diverse efforts.

With respect to the Special Programs, the Committee believes that the work is being expertly and competently addressed with important products that are well matched to client needs.

With respect to special programs projects, the DRC found that:

- The analytical efforts, nuclear facilities work, and chemical detection methodologies are well founded within the Laboratory's traditional areas of expertise and are particularly innovative and productive. PNNL is to be commended on the caliber and quality of the work and staff.
- The foreign reactor analysis project is a valuable effort that takes advantage of the skills and expertise resident in the Laboratory, and the products are valuable to decision makers with respect to both health and economic impacts.
- The projects focussed on the Internet have promise and are synergistic with the efforts in support of Critical Infrastructure.

Classification requirements limit further discussion of this area.

With respect to the Medical Systems Product Line, the DRC found:

- The projects (1) to develop radiation therapies based on tumor-specific monoclonal antibodies linked to alpha emitting radionuclides and (2) to use a novel polymers to treat solid tumors are unique and fascinating.
- The DRC found great potential for the collaborations with the DoD R&D medical community noting specifically the development of antimicrobial coatings for bone fracture treatment, MUSTPAC ultrasound telemedicine, breath analysis by mass spectroscopy, and SPIRE's language characterization, document analysis, and information visualization information technology. Each program was characterized as excellent.

The Chemical-Biological Defense Product Line is a collection of technology development projects directed to monitoring, assessing, and countering airborne agents. Given the early stage of development of the presented technologies, the DRC did not make an overall judgment. It did recommend that a sharper definition of specific research areas be made in which the Laboratory has a competitive advantage.

Response to1998 Review: DRC comments/recommendations on individual projects were transmitted to the Principal Investigators for their consideration. The actions taken in response to the 1998 review were summarized and presented to the DRC by Mike Kluse. At the closeout of this year's review, Greg Choppin, DRC chair, said that the NSD response to recommendations was the best that he had ever received from a DOE Laboratory.

The following topics were identified from this year's review as warranting further discussion with the DRC: development of NSD's strategic and tactical plans, disposition of the Medical Systems technology area, and the business focus of the Safeguards and Security and Chemical and Biological Defense technology Product Lines. It was recognized that the DRC's comments on both the Safeguards and Security and Chemical-Biological Defense Product Lines in reference to technology/business focus are due primarily to the DRC's limited exposure to the entire Product Line business portfolios, a process inadequacy that is presently being resolved.

Environmental Technology Division

Review Scope: The review was held June 8-9, 1999. The major focus of this meeting was the Division's Environmental Management sub-sector strategy and the Process and Measurement Technology Product Line. The charge to the DRC was to address the following questions: (1) Is

the ETD strategy clear: (2) Is implementation of the strategy linked to its goals: (3) Are resources adequate to realize the strategy? (4) Is the base for future new clients being adequately built?

General Comments: The DRC assigned an overall rating of "Excellent" for the program components reviewed. The ETD strategic intent is quite clear, and the Division has done a good job in this respect over the last few years. The DRC noted that the review took place at a time of significant change and uncertainty with respect to ETD and Laboratory leadership, specifically mentioning the departure of Bill Shipp. The DRC was pleased to see good leadership and technical competence at the sites visited which included the Radiochemical Processing Laboratory, the Applied Process Engineering Laboratory, and the EMSL.

The linkage between ETD's strategic goals and its implementation strategies at the Division and sub-sector level was not made totally clear to the DRC, however the linkage at the product line level was very clear and strong. The Division should consider allocating more time in the future to present its findings in this area.

The Committee found that technical resources are adequate to fulfill the Division's strategy but did encourage the Division to rapidly replace lost personnel and make strategic hires as the evolution of technical areas progressed. The DRC also urged the Laboratory to quickly address the issues of senior management vacancy and the availability of marketing resources.

The Committee found that there is a major emphasis by the Division to increase market penetration with existing customers and thought that to be a reasonable approach. However, the DRC could not assess fully whether the base for attracting new customers was being adequately built.

The Committee expressed three concerns related to stable long-term leadership. They are staff insecurity and uncertainty, lack of effective transition planning, and the use of the Laboratory's Human Resources staff in the transition process. The DRC urged increased communication with the staff, adding that the speedy selection of an Associate Laboratory Director would be the best solution. (**Note**: Walt Apley was selected in August as the ALD for the ETD Division).

Specific Comments: With respect to the Process and Measurement Technology Product Line Strategy, the DRC found that

- The Product Line has the resources (technologies, facilities, and staff) to carry out its stated strategy with the exception of key hires.
- Product Line success is tantamount to the success of ETD, and each Product Line should focus on the sustainability of their individual strategies.

With respect to the Chemical Separations and Slurry Processing Group, the DRC found that:

- The group's strategy is clear.
- They are doing a good job in tying fundamental science to specific problems.
- Their diversification is likely to pay off in the future.

With respect to the Radiochemical Processing Laboratory, the DRC found that:

- This facility is healthy, vital, and fully productive in spite of the fact that a major reorganization of the facility was recently implemented.

- It is the model for a radiochemical facility that is under severe regulatory and compliance constraints.
- Not only does the facility have a strategic plan and vision, the DRC was impressed with its entrepreneurial spirit.

With respect to EMSL, the DRC found that:

- The efforts to link fundamental science at EMSL to development of a knowledge and experience base to be applied to some of the Hanford site problems were successful.
- EMSL should aggressively market its "user" aspect of the facility.
- EMSL scientists are expected to produce peer-reviewed papers of quality science while the development groups may not have that expectation. This situation needs to be addressed.

Response to 1998 review: The Division responded to the recommendations of the reviewers. The format of the review was changed to make it longer and more specific, and two new members were added to the DRC. Comments on individual projects were transmitted to the Principal Investigators for their consideration. The DRC in their close out of this year's review noted specifically that the Division had addressed their recommendations from the 1998 review.

V. External Peer Review of PNNL Programs

A number of programs were peer reviewed under sponsor auspices during FY 1999. The results of these reviews are summarized below. The reports present a brief summary of the overall review, reviewer comments and accompanying recommendations on issues that need to be addressed, and the Laboratory's response and actions taken to address reviewer recommendations/suggestions.

Chemical Physics Program, Office of Science, Office of Basic Energy Sciences, Chemical Sciences Division

Review Scope: This review was held March 8-10, 1999. This is an annual review in which the Office of Basic Energy Sciences (OBES) reviews projects every two to three years. This year the OBES-sponsored and -staffed review of the Chemical Physics program had four external reviewers who reviewed both experimental and theoretical work.

General Comments for the Chemical Physics Program: BES noted that it is plainly evident and should be rewarding to the laboratory that the technical programs were viewed very positively. BES was pleased that the Chemical Physics at PNNL has achieved national recognition for excellence in experimental research and that the better integration of experimental and theoretical work will serve to strengthen the overall effort.

Specific Comments for the Chemical Physics Program: The reviewers provided comments on the projects of individual Principal Investigators.

Experimental science: [Have] first-rate scientists who possess national reputations for insightful and creative research. They are part of an experimental research team that is performing world-class research. The scientists work together in an interactive, cooperative way that reinforces and extends the other's efforts.

Theoretical Science: Laboratories like EMSL possess advantages that set them apart from research universities including substantial injection of funds, the opportunity to perform cooperative and focussed research, and intensive commitment of time by the PIs. These advantages overall are well exploited at EMSL.

Response to review: Although the review was conducted months ago, the Laboratory only recently received its formal report. Responses to recommendations are only now in process.

Materials Science Program, Office of Energy Research, Office of Basic Energy Sciences, Materials Science Division

Review Scope: The review was held June 10-11, 1999. This is an OBES-sponsored and staffed annual review in which projects are examined every two to three years. *The results of this review have not been communicated to the Laboratory per communication with Headquarters staff.*

Chemical Energy Program, Office of Science, Office of Basic Energy Sciences, Chemical Sciences Division.

Review Scope: This review was held March 7-9, 1999. This is an OBES sponsored and staffed review. "Free Radical Chemistry of Energy Utilization" was reviewed.

General Comments: This program has moved into a new area, the measurement of the fundamental kinetic and thermodynamic properties of organometallic intermediates. [The PI] has done an excellent job in leading the team into a new scientific direction, and the group has shown excellent creativity in its approach to solving problems. The program bristles with remarkable chemical accomplishments, intriguing and useful developments in techniques, and the promise of greater things to come. With the decline of support by NSF and related agencies for quantitative, mechanistic organic chemistry, the group stands as one of the last bastions of quantitative efforts that provide experimental lynch pins for the understanding of reactions.

Response to review: Although the report was received only recently, the group is addressing the recommendations.

Peer Review of New Proposal Submissions

Environmental Management Science Program (EMSP): The internal PNNL process for selecting proposals to be submitted to DOE-EMSP for its peer review is a rigorous one. Several multidisciplinary teams are formed months in advance of the submission date. The teams include a steering committee, technical teams, proposal-writing teams, review groups, and a support production team. A fraction of the research ideas generated by a Laboratory-wide call are selected for which pre-proposals are prepared for DOE. Full proposals are prepared for those receiving approval from DOE.

The results of PNNL competition for EMSP awards were outstanding.

- The Laboratory submitted 17 proposals and was a partner in another 25 proposals from other institutions.
- The Laboratory won 7 EMSP awards and was a partner in 9 proposals from other institutions.

- Of the approximately $12M available for national laboratories, PNNL staff were awarded $7.5M (62% of the total) for new EMSP research. PNNL's share is 31% of all new EMSP dollars going to all institutions (national labs, universities, and other agencies).

OBER Health Effects and Life Science Research Low Dose-Low Dose Rate Radiation Program Competition: The Laboratory used a proposal selection process much like the EMSP process described above. The results of the competition were outstanding. Success in this competition was extremely important for the Laboratory's future in the biological sciences. Not only were new projects obtained to replace those lost a few years ago with the redirection of OBER radiation biology programs, the proposed projects were based on cell signaling science and technology being developed under the auspices of the Laboratory's Environmental Health Initiative (EHI). The wins gave the Laboratory a credibility that was acknowledged by input on the EHI given by Martha Krebs and Ari Patrinos at the Office of Science Onsite Review held September 1, 1999.

- Six pre-proposals were submitted to OBER, and five were selected for preparation of full proposals. For comparison, OBER received 160 preproposals from all sources and requested full proposals for about half of them.

- Of the five proposals submitted by PNNL, four were selected for funding, a success rate of 80%.

Office of Science Carbon Sequestration Center Program Solicitation: The solicitation announced last February was for "Centers" for terrestrial and oceans fundamental research in support of enhancing carbon sequestration. Again, the results were outstanding.

- PNNL led an effort to form a distributed Center. The Center consortium has three national laboratories (PNNL, ORNL, and ANL), five university partners, one private research organization (Rodale Institute), one Austrian collaborator, and four USDA collaborators. Of the $3M available, the consortium Center described above won $2M. The only other Center funded was an LLNL/LBNL consortium.

- *Natural and Accelerated Bioremediation (NABIR):* This year only five new proposals were funded nationally, and PNNL had two of the five.

VII. Overall Assessment of Results of Peer Review

During FY1999, all Laboratory commitments made with respect to peer review were achieved.

- *Laboratory Review Committee (LRC):* The LRC held its annual meeting. Composed of chairs of the DRCs, this committee reports to the Director. The Director reaffirmed the LRC charter and the Laboratory's commitment to formally respond to DRC recommendations and share the response with the DRC. Each of the four cross cutting issues described under III will be addressed during the next fiscal year.

- *Division Review Committees:* The process of Laboratory-initiated external peer review by Division Review Committees was complete. DRCs of each of the Laboratory's four technical Divisions met during the year, and reports of the review results were prepared and communicated to the Divisions. Two Divisions (ED and ETD) were ranked "Excellent", and two (EHSD and NSD) were ranked "Excellent-Outstanding. Each of the Divisions is formally responding to the DRC observations/recommendations from this year's review.

- *External Peer Review of PNNL Basic Energy Sciences Programs:* Three programs were reviewed this year. The reviews of the Chemical Physics and Chemical Energy Programs were outstanding. The results of the Material Science Program have not been received.
- *Peer Review of New Proposal Submissions:* The results from the EMSP, OBER Low Dose, and OBER Carbon Sequestration Center, and NABIR competitions were outstanding.

The Laboratory made a commitment to institutionalize peer review and utilize the information acquired to improve both the peer review process and the quality of science, engineering, and technology. It is important to note that interactions between Laboratory and DOE-RL staff have led to creation of a peer review program in which the process itself and the utilization of derived information are the most important elements. The descriptors/rankings applied to the science and technology work reviewed are useful and informative to identify issues that must be addressed but in themselves neither drive the process nor provide its most important product.

The Laboratory's performance in "Results of Peer Review (1.1.1)" is outstanding. All commitments and milestones were completed. The Laboratory Review Committee and Division Review Committees discharged the responsibilities formalized in their charters. Each Division has responded to DRC observations/recommendations from last year's review and been commended by each DRC for their actions. All sponsor-initiated reviews were completed and actions taken on recommendations/findings. The descriptors applied by the DRCs to Divisions' activity ranged between "Excellent" and "Excellent- Outstanding." Finally, the Laboratory's process for selection and submission of proposals in response to major Request for Proposals issued by funding agencies has produced outstanding results this year.

Appendix B

Summary of Organizational Strengths and Areas for Improvement Identified Through Self-Assessment

Summary of Organizational Strengths and Areas for Improvement Identified Through Self-Assessment

Introduction

This year the Laboratory performed at an overall 'outstanding' level in its ability to use self-assessment to achieve business results and continuously improve performance. This result is measured by Performance Indicator 3.2.1, which is based on the final score from the Laboratory Independent Evaluation process. This section of the report provides a summary of the primary strengths and key improvement themes identified during the Laboratory's independent evaluation.

Background

During FY1999, the Integrated Assessment management system owner coordinated an independent evaluation of the Laboratory's effectiveness in deploying the self-assessment process and in using self-assessment to drive continuous performance improvement. The evaluation team consisted of two internal senior examiners, DOE, an external subject matter expert, and the Integrated Assessment management system owner. Each Division and Directorate prepared and submitted a self-evaluation report for the independent evaluation process. Figure 1 depicts the general steps involved in the FY1999 evaluation process.

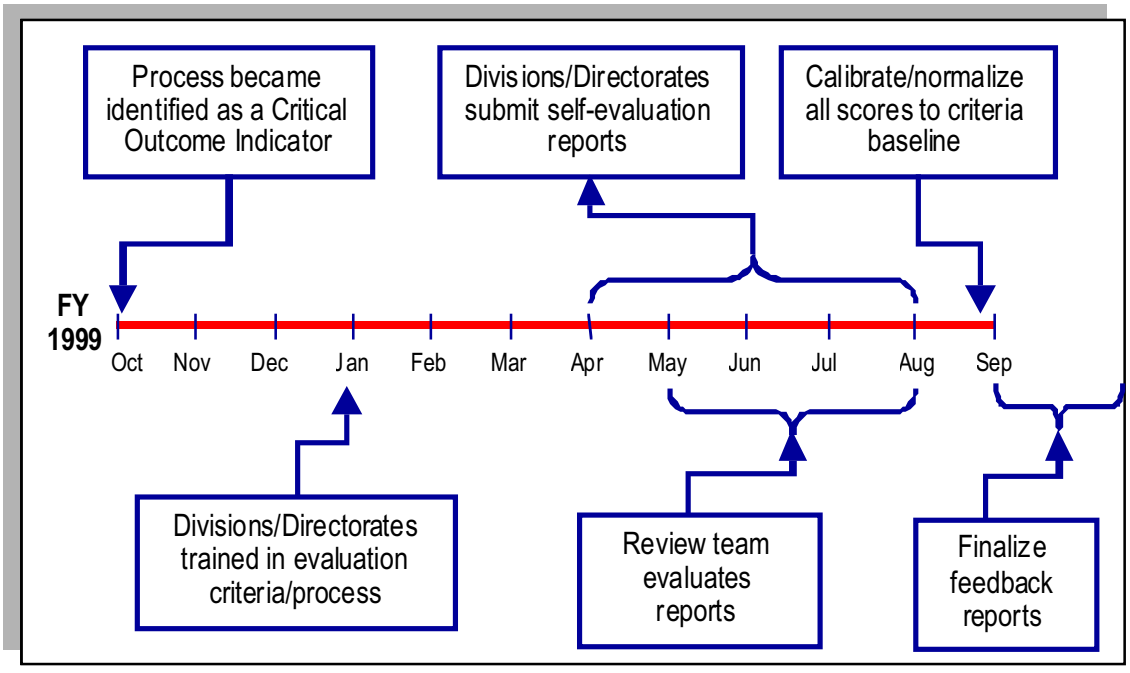


Figure B.1. FY 1999 Independent Evaluation Process

The criteria used in the independent evaluations are internationally recognized as representing the basis for a results-oriented, continuously improving organization. The criteria address the following key areas:

- The performance measurement system, i.e., how the Division/Directorate selects, manages, and uses information and data to support decision-making and to improve performance (our self-assessment process)
- The business results and performance improvement achieved by the Division/Directorate in key business areas, i.e., customer results, financial and market results, human resource results, and organizational effectiveness, including compliance results.

Evaluation Deliverables

The team developed several products resulting from the evaluation process. Formal written feedback, which included detailed strengths and opportunities for improvement, was developed for each Division and Directorate. Each Level 1 manager will receive this feedback in the form of a formal feedback report to be delivered in early to mid-November. In addition, during October each Division and Directorate Level 1 manager also received an executive summary briefing of their organization's evaluation results, which covered the most significant strengths and key opportunities for improvement. Best practices from other industries were also offered for consideration, targeted to their key improvement areas.

The evaluation team compiled, and summarized all Division/Directorate opportunities for improvement to identify the key Laboratory improvement areas for self-assessment. This summary was provided as input to the FY-end analysis of Integrated Assessment. The other functions that provided input to this analysis of Integrated Assessment include Internal Auditing, Independent Oversight, and Peer Review. The product from the IA analysis is a consolidated set of Lab-level key vulnerabilities for consideration by the Leadership Team.

Summary of Strengths

As the evaluation team reviewed the results from all Divisions and Directorates self-evaluation reports, several primary strengths of the Laboratory's Self Assessment process were identified. Specific details of the evaluations will be available as part of the final feedback report to each Level 1 manager.

- All Divisions/Directorates have a self-assessment plan with performance measures used to review performance against the organization's objectives. Organizations that own management systems also use a separate assessment plan for each management system.
- The Division/Directorate self-assessment plans have linkages with the Laboratory's Critical Outcomes that reflect specific responsibilities for results and may include additional areas where supporting objectives are defined.
- Assessment plans are reviewed and updated at least annually. Many Divisions/Directorates update their plans more frequently as business needs change.
- Some Divisions/Directorates use regular performance analysis processes to understand and improve the linkages between their assessment processes and the opportunities for improving key business results.

- Divisions/Directorates use a variety of methods to deploy the assessment plans to staff, including SDR objectives, staff meetings, and web sites.

Summary of Key Improvement Themes

The evaluation of Divisions/Directorates revealed several general areas where opportunities exist to improve the self-assessment process. Although these improvement areas are provided as general themes, pockets of 'good Laboratory practices' in specific organizations were identified that could serve as model practices and lessons learned for other organizations throughout the Lab. There is an expectation that Divisions or Directorates with Good Lab Practices will offer to share their experience with others.

Table B.1 identifies the improvement themes associated with the self-assessment process. Table B.2 identifies improvement opportunities associated with providing evidence of business results.

Table B.1. Key Improvement Themes from Laboratory Evaluations

Measurement System Improvement Areas	Complementary Good Laboratory Practices
Measurement System Alignment: In many cases, performance measures do not clearly align to support an organization's strategic objectives/intents, management system performance, functional/daily operations, technical thrusts, and Laboratory initiatives.	The Energy Division's balanced scorecard approach to performance measurement comes the closest to providing linkages to all important objectives that the Division needs to measure to ensure they are successfully meeting their goals.
Cost of Improvement Options: In many cases, it is not clear how a cost or financial understanding of improvement options is developed.	F&O's Steering Committee works with their Lessons Learned Coordinator to be proactive towards operational improvements.
Use of Comparative Data: In many cases, comparative data from external competitors (e.g., other national laboratories) or benchmark companies is not used to develop performance measures, set stretch goals, or evaluate the relative value of PNNL's performance. Best practices from other organizations are not used to set improvement objectives.	Use of comparative and benchmark data for input to planning, setting performance targets, driving improvements: Human Resources, Saratoga Institute; Finance, Hackett Group Benchmarking Study; Facilities & Operations, national benchmarking group and EFCOG.
Use of Analytical Processes: With some exceptions, there is little discussion of methods used to analyze data, such as cause-effect correlations, trends, projections, comparisons used to evaluate data and support decision making. Trending performance, however, is prevalent.	Data analysis: Strategic Planning's use of analytical methods is comprehensive. Finance performs frequent analysis and summary of all key performance data.
Deployment/Staff involvement: The majority of staff are not involved in the development or monitoring of an organization's performance measures. Staff are unclear about how their performance contributions support the achievement of their organization's high level strategies and objectives.	HR's Directorate Agenda tracks important projects that support assessment plan goals. This Agenda is used to help develop related SDR goals for staff. EHSD's newsletter communicates individual and organizational accomplishments to staff in everyday language designed to make all staff feel included in the Division's successes.

Table B.2. Improvement Areas Associated with Business Results

Business Results Improvement Areas	Complementary Good Laboratory Practices
Customer focus: ❑ Over-reliance on annual Lab-level customer feedback process ❑ Over-reliance on soft measures such as customer satisfaction ❑ Minimal use of leading indicators ❑ Limited use of dimensions such as customer dissatisfaction and relationship building ❑ Little customer segmentation	
Financial/Market: ❑ Little use of predictive measures ❑ Little use of comparative data	
Human Resources: ❑ Over-reliance on Lab QWL survey ❑ Over-reliance on soft measures ❑ Limited use of dimensions such as staff development ❑ Little segmentation of staff groups	Evaluation of HR issues important to business success: EHSD's use of the Climate For Innovation survey
Organizational Effectiveness: ❑ Lack of performance indices to streamline large number of measures ❑ Results not reported for areas identified as key to business success and/or identified in organization's self-assessment plan	
General: Ineffective graphical display of data (charts and graphs). Generally lacking ❑ Performance targets ❑ Past performance levels ❑ Incomplete or unclear labels	