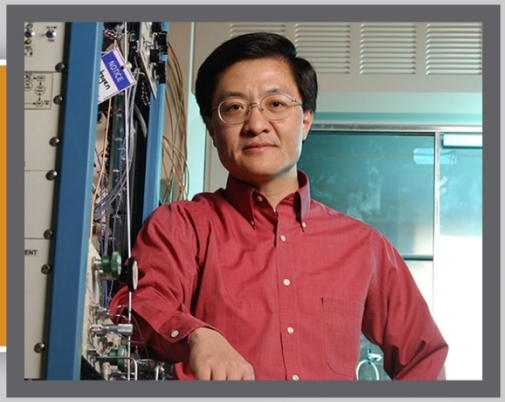
2013 Operational Excellence Culture Evaluation



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SAFETY
SUSTAINABILITY
ENGAGEMENT
INVOLVEMENT
EXCELLENCE
PROMOTE
LEADERSHIP
HEALTH
RISK MANAGEMENT
COMMUNICATION
CONTINUOUS IMPROVEMENT

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Operational Excellence Culture Evaluation

March 2013

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Summary

Pacific Northwest National Laboratory's (PNNL's; Laboratory's) 2013 Operational Excellence Culture Evaluation provides an analysis of the Laboratory's operational culture and performance during the calendar year (CY) 2012. In addition, this report documents a strategy for achieving operational excellence by continuously monitoring and improving our leadership capability, risk management, and staff engagement. At PNNL, "operational excellence" means harnessing the energy and passion of every staff member to accomplish our mission: delivering outstanding research results in science and technology while cost effectively managing the Laboratory with the highest standards of good citizenship, safety, health, and environmental stewardship. PNNL's culture of operational excellence means that we serve every customer with distinction and we do not compromise the quality of our research, products, or reputation. Every staff member adheres to the highest levels of ethical, moral, and professional conduct.

The evaluation uses a synergistic approach that integrates the Voluntary Protection Program (VPP), integrated safety management (ISM), and the International Organization for Standardization (ISO) 14001 elements into a single set of organizing principles that address the hearts, minds, and actions of staff and provide a platform for continuous improvement that enables enhanced mission execution. The evaluation meets the expectations for the annual VPP evaluation as required by the VPP Star Program (U.S. Department of Energy [DOE]-EH 1994) and the ISM expectations for performance evaluation and continuous improvement per the DOE Acquisition Regulation (DEAR) clause, *Integration of Environment, Safety, and Health into Work Planning and Execution* (DEAR 2011).

PNNL's Credo for Operational Excellence defines the desired cultural attributes and is the basis for the measurement and analysis contained in this evaluation. The Credo focuses on four themes: leadership, risk management, continuous improvement, and engagement. The objectives of these themes align well with the tenets and sub-elements of VPP as well as the elements of ISM and ISO 14001. A summary of combined key surveys and associated contractor assurance processes was used in the development of observations and actions. Performance indexes were developed for all four themes, and goals for each index were set to distinguish outstanding and world class performance for quantitative measures.

Current data indicate that PNNL's strong safety and operational performance is close to the "outstanding" goal that places the Laboratory in the top quartile of similar, highly engaged companies across the country, and the Laboratory is firmly on an improvement path. PNNL was once again the top safety performer of any DOE Office of Science multi-program Laboratory for 2012. Analyses support that the focus on safety over the past decade has resulted in increased safety values and practices that compare favorably to the safest companies in North America. Opportunities for improvement were identified and tied to Laboratory-level initiatives as well as specific actions that the VPP Steering Committee will champion over the coming year.

The 2013 Operational Excellence Culture Evaluation reflects the Laboratory's quest for outstanding performance by evaluating ourselves against our aspirations for operational excellence, including safety, and reaching beyond the VPP star. This supports the PNNL management and operational approach to deliver simultaneous excellence in science and technology, management and operations, and community service. The VPP Onsite Review Recertification Team validated PNNLs progress in 2012 by making the following statement in the final report, "Since the last triennial recertification, PNNL has reenergized and expanded its safety and health initiatives into a sustainable focus on operational excellence."

Acronyms and Abbreviations

AHA	acquisition hazard assessment
ALD	Assistant Laboratory Director
BOC	Battelle Operations Committee
BSF	Biological Sciences Facility
CAIRS	Computerized Accident/Incident Reporting System
CAS	Contractor Assurance System
CBP	core business process/plan
CSM	cognizant space manager
CY	calendar year
DART	days away/restricted and/or transferred time
DEAR	DOE Acquisitions Regulation
DOE	U.S. Department of Energy
DSOC	Directorate Safety and Operations Council
ECP	Employee Concerns Program
EHS&S	Environmental, Health, Safety and Security (Directorate)
EMSL	Environmental Molecular Sciences Laboratory
EPR	Electronic Prep and Risk
ES&H	environment, safety, and health
F&O	Facilities and Operations
FY	fiscal year
HDI	How Do I? (standards-based management system)
IMS	Integrated Management System
IOPS	Integrated Operations System
ISM(S)	Integrated Safety Management System
ISO	International Organization for Standardization
Laboratory	Pacific Northwest National Laboratory
LANL	Los Alamos National Laboratory
LL	Lessons Learned
LSOC	Laboratory Safety and Operations Council
LWIF	lost work injury frequency
M&O	management and operations
M&S	material and specimen
OE	Operational Excellence (Program)/operating experience
ORNL	Oak Ridge National Laboratory
ORPS	Occurrence Reporting and Processing System
OSD	Operational Systems Directorate

PM	project manager
PNNL	Pacific Northwest National Laboratory
PNSO	Pacific Northwest Site Office
PPE	personal protective equipment
Q	quarter
Q^{12}	Gallup® professional, scientific, and technical service database
R&D	research and development
R2A2	Roles, Responsibilities, Accountabilities, and Authorities
ROC	PNNL Research Operations Committee
RPR	Radiological Problem Reports
SDR	Staff Development Review
SHIMS	Safety and Health Information Management System
SME	subject matter expert
SCWE	safety conscious work environment
TA	technical administrator
TOR	Technical Oversight Representative
TRC	Total Recordable Case
VPP	Voluntary Protection Program
VPPPA	Voluntary Protection Program Participants' Association
WS&H	worker safety and health

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1.0 Overview

1.1 Beyond the VPP Star: Achieving a Culture of Operational Excellence

In 2010, PNNL implemented an innovative, holistic process to understand cultural attributes and improve operational performance through the lens of workforce engagement. This synergistic approach integrates VPP, ISM, and ISO 14001 elements into a single set of organizing principles that address the hearts, minds, and actions of staff and provide a single platform for continuous improvement that enables enhanced mission execution through ***operational excellence***.

PNNL's vision of operational excellence is that environmental, safety, and health (ES&H) functions will be embedded into the Laboratory's business processes and universally adopted. Looking beyond "safety programs" or "environmental programs," PNNL's intention is to excel in engaging all levels of operational management, resulting in outstanding research and development, while maintaining our commitment to safety, health, and environmental stewardship. In addition to establishing a strong ES&H culture, operational excellence means:

- We serve every customer with distinction.
- We do not compromise the quality of our research, products, or reputation.
- Every staff member adheres to the highest levels of ethical, moral, and professional conduct.

The 2012 Operational Excellence Culture Evaluation reflects the Laboratory's quest for outstanding performance by evaluating ourselves against our aspirations for operational excellence, including safety, and reaching beyond the VPP star.

1.2 Background

The management of ES&H programs has evolved from a compliance-based reactive focus brought on by the Occupational Safety and Health Administration Act in the 1970s to a desire to proactively prevent workplace injuries and improve the safety and operational culture. Procedures, training, and tools have been established and continuously improved to increase awareness, reduce risk, and ensure compliance. These traditional ES&H program elements, although valid and necessary, were not by themselves sufficient to achieve organizational excellence. The adoption of ISM, ISO, and VPP programs expanded and broadened the engagement of the workforce, combining management commitment and employee involvement, and further driving improvements in safety performance.

PNNL's vision to achieve the "next level" of exemplary performance is through operational excellence, which is to be driven by the culture of the organization through the beliefs and behaviors of the staff. The results of this holistic approach will simultaneously stimulate excellence in all business objectives (such as safety, environment, quality, productivity, sustainability, and profitability) and better position the Laboratory to continue to deliver world class science while maintaining our commitment to safety, health, and environmental stewardship.

1.3 Integrating ISM, VPP, and ISO 14001

In addition to transcending the traditional elements of ES&H, the process employed for the 2013 Operational Excellence Culture Evaluation integrates key aspects of ISM, VPP, and ISO 14001. Although these programs have uniquely identifiable guiding principles, tenets, attributes, and elements, they provide a common, fundamental framework of leadership, risk management, continuous improvement, and engagement.

1.4 Alignment of VPP Tenets

The Operational Excellence Model was developed by integrating VPP tenets into the themes of leadership, risk management, continuous improvement, and engagement. Appendix A provides a crosswalk that demonstrates how each VPP tenet and sub-element is contained within the operational excellence themes and is summarized below:

- *Management Commitment* – Incorporated by addressing elements such as communicating expectations, setting examples, visiting workplaces, lessons learned, and performance management.
- *Employee Involvement* – Incorporated by addressing elements such as stop work authority, team members supporting and taking personal responsibility for themselves and others, maintaining a questioning attitude, staff recognition, reporting deficiencies, and encouraging staff to make suggestions and raise issues.
- *Worksite Analysis* – Incorporated by addressing elements such as risk identification, prevention, and mitigation processes, as well as performance management.
- *Hazard Prevention and Control* – Incorporated in conjunction with worksite analysis by addressing elements such as risk identification, prevention, and mitigation processes.
- *Safety and Health Training* – Incorporated by addressing elements such as stop work authority, team members supporting and taking personal responsibility for themselves and others, error prevention, and layers of defense.

1.5 Alignment of ISM Core Functions and Principles

The Operational Excellence Model was developed by integrating ISM core functions and guiding principles into the themes of leadership, risk management, continuous improvement, and engagement. Appendix A provides a crosswalk that demonstrates how each ISM core function and guiding principle is contained within the operational excellence themes.

Various levels of organizational culture are depicted in Figure 1.1 and are as described in the *Integrated Safety Management System Guide* (DOE 2008). The outer level represents the environment within which the work takes place and is most influenced by the ISM principles and safety culture elements. The next level is the process level where systems are defined to direct behaviors, which is most influenced by the ISM functions. The inner-most level is the activity level where operational work is performed. Performance measures at each level show how effectively the process and culture support the objectives of operational excellence.

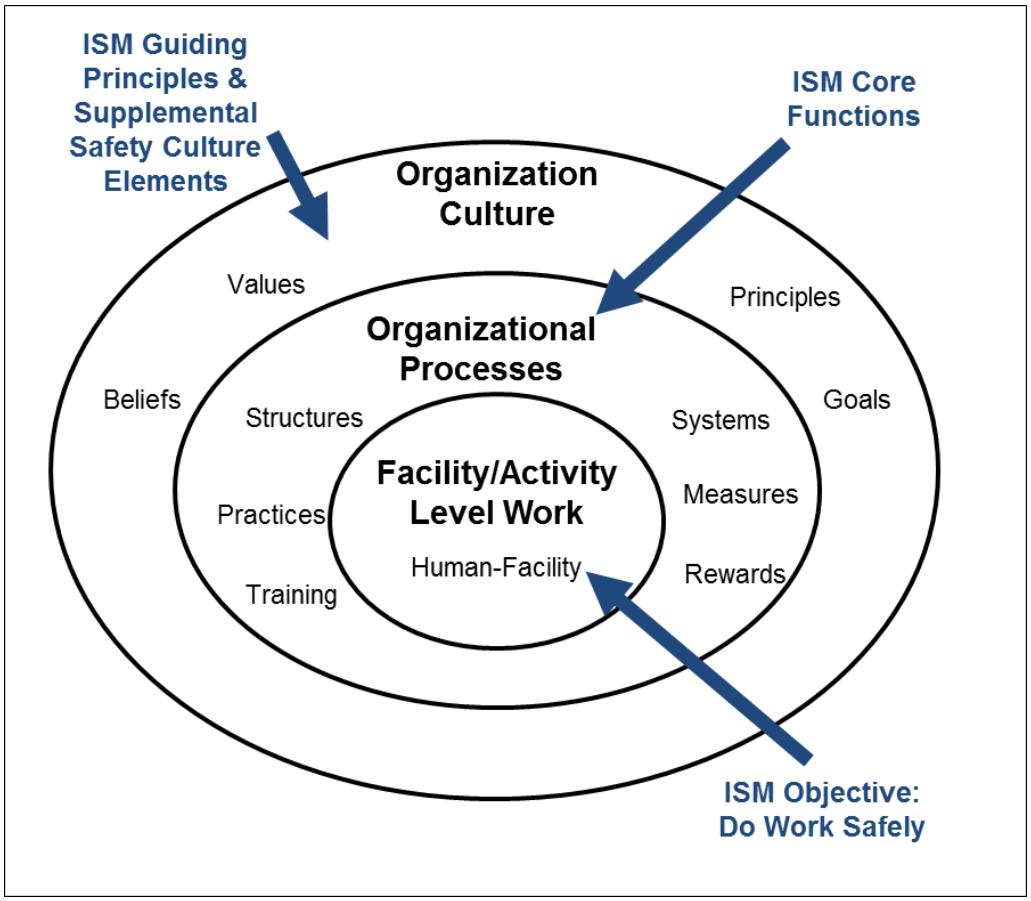

Figure 1.1. Organizational Levels Conducting Work with Operational Excellence

2.0 Methods

There is no simple indicator that measures the state of organizational culture. The multilevel nature of culture requires a broad range of indicators, some of which may be more subjective than others. To provide a general overview of the Laboratory's progress toward achieving many of the attributes of an outstanding culture of operational excellence, a culture index was built by themes, including leadership, risk management, continuous improvement and engagement (Section 3.0). The themes and associated objectives are depicted in the PNNL Credo for Operational Excellence (Figure 2.1). Additional information on the foundation of PNNL's Operational Excellence Credo and associated attributes is included as Appendix B.

I Believe		I Know	I Do the Following
THEME: LEADERSHIP			
	Human life and health have value above all else	My actions set examples that ensure operational excellence and positively impact the Laboratory's reputation I must create an environment where open and honest inputs are encouraged and addressed fairly	Hold managers and individuals, including myself, accountable for our actions Consistently communicate performance expectations and recognize a job well done Visit the workplace frequently
THEME: RISK MANAGEMENT			
	All incidents are preventable Human error is inevitable; but I can reduce its likelihood and severity	I understand the scope of work, the associated risks and how to manage the risks I must act to reduce the likelihood and severity of human error to prevent incidents	Ensure that work is planned and there are adequate resources to do work right Anticipate and recognize change and reassess risks
THEME: CONTINUOUS IMPROVEMENT			
	To improve we must be innovative and learn from our experiences	I strive to continuously improve the way we work	Incorporate feedback and learning from others to improve Encourage people to make suggestions, raise issues and actively participate in resolution
THEME: ENGAGEMENT			
	I am responsible for my own well being and for the well being of all those around me	We all have the authority to stop work and are expected to use it when needed	Actively care for the safety and welfare of myself and others Maintain a questioning attitude

Figure 2.1. Operational Excellence Credo

Generally, cultural norms can be characterized through observation, interview, and surveys. Survey results for the Operational Culture Survey (formerly VPP Staff Survey), an evaluation of 2010 to 2012 survey feedback, the Research and Sentiment Survey, various operational reports, group feedback, interviews, and other input provided the primary basis for understanding the Laboratory's culture.

The Integrated Management System (IMS) and associated core business processes (CBP) as well as management and operation (M&O) programs have methods for assessing performance. Performance

indicators and supplemental analysis provide metrics on the effectiveness and efficiency of tools and processes, including work flow metrics and Laboratory-level indicators. These are all part of the Laboratory's robust Contractor Assurance System (CAS).

2.1 Operational Culture Survey

In 2011, the VPP Staff Survey was revised and updated in response to comments from the December 2010 survey and a desire to capture relevant data. The survey name was changed to the Operational Excellence Culture Evaluation. Questions were rewritten for clarity to gain specific data and included eight leadership-focused questions developed by the Battelle ES&H Community of Practice. These questions are being used by all the Battelle Affiliated Laboratories to develop a common baseline to evaluate individual Laboratory performance and promote organizational learning across DOE's National Laboratory complex. The remaining nine questions are specific to PNNL and will gather data pertaining to risk management, staff engagement, and training.

Beginning in October 2011, survey deployment was changed from an annual survey distributed usually in November or December to all PNNL staff to a survey distributed each quarter to randomly assigned staff members. The quarterly survey format is intended to gather information that more accurately represents performance over the course of the entire year. The Operational Culture Survey questions are linked to the tenets of VPP and measure the extent that these beliefs and practices exist and their effectiveness. Appendix C provides a compilation of the first quarterly survey questions and responses.

Over four quarters of 2012 the survey was distributed via email to 4091 staff members and generated a 55% response rate, similar to the FY 2011 Laboratory-level response rate. A total of 800 comments were received from survey respondents over four quarters. Comments were coded and placed into categories. (PNNL 2012a)

2.2 Research Sentiment Survey

In 2012, the annual Research Productivity Sentiment Survey was distributed to staff members within the research directorates for the fourth successive year. Survey deployment was changed from an annual survey to all PNNL staff to a survey distributed each quarter to randomly assigned staff members. The purpose of the survey was to determine research staff sentiment about their ability to accomplish research and project goals productively. Results indicate that staff sentiment has improved over the last 3 years with improvement in several areas, including acquisitions, setting up projects, sustaining and developing expertise, efficient use of resources, facilities and infrastructure, and access to research specimens and materials (PNNL 2012c). Much of this improvement can be attributed to past and ongoing improvement initiatives, some of which were initially targeted based on previous survey results. The survey results also noted some areas of staff frustration with business development, understanding sector priorities, setting up projects, making acquisitions, and publishing technical documents. In some areas, support staff are perceived as being highly valuable. These results have been communicated to research and operations management at various levels and will be used to inform ongoing and future improvement efforts and evaluate their impact.

2.3 VPP Triennial On-Site Review Report

An DOE VPP Team performed a triennial on-site review to assess the effectiveness of PNNL health and safety programs against VPP expectations (DOE 2013). During the site visit the team observed activities, evaluated documents and procedures and conducted interviews. The team contacted over 250 employees, managers, and supervisors either formally or during observation of field activities. The report concluded that PNNL has expanded its health and safety initiatives into a sustainable focus on operational excellence and that process improvements begun in 2009 are reaching maturity and gaining acceptance among researchers. The team recommended that PNNL continue in the DOE-VPP at the Star level.

2.4 Contractor Assurance System

The Contractor Assurance System (CAS) provides reasonable assurance that the objectives of the contractor and the goals and requirements of the customers are being accomplished and that the systems and controls are and will be effective and efficient. CAS includes the Laboratory Performance Management, Corporate Governance, and the DOE oversight function resulting in a single, comprehensive assurance system.

PNNL stewardship, mission accomplishment, program delivery, and operational and financial management are delivered through an IMS that defines how work is done at PNNL. Composed of a set of eight CBPs, the PNNL IMS (Figure 2.2) is the framework by which operational considerations, including safety, is integrated into all work at the Laboratory. The operational excellence themes are woven into these business processes through a set of controls applied to various work stages. Each PNNL CBP is composed of several workflows and delivers M&O programs to users. Performance indicators for the CBPs are monitored and improvements in processes, systems, and people are identified, prioritized, planned, and executed to further enable the conduct of research. (PNNL 2012b)

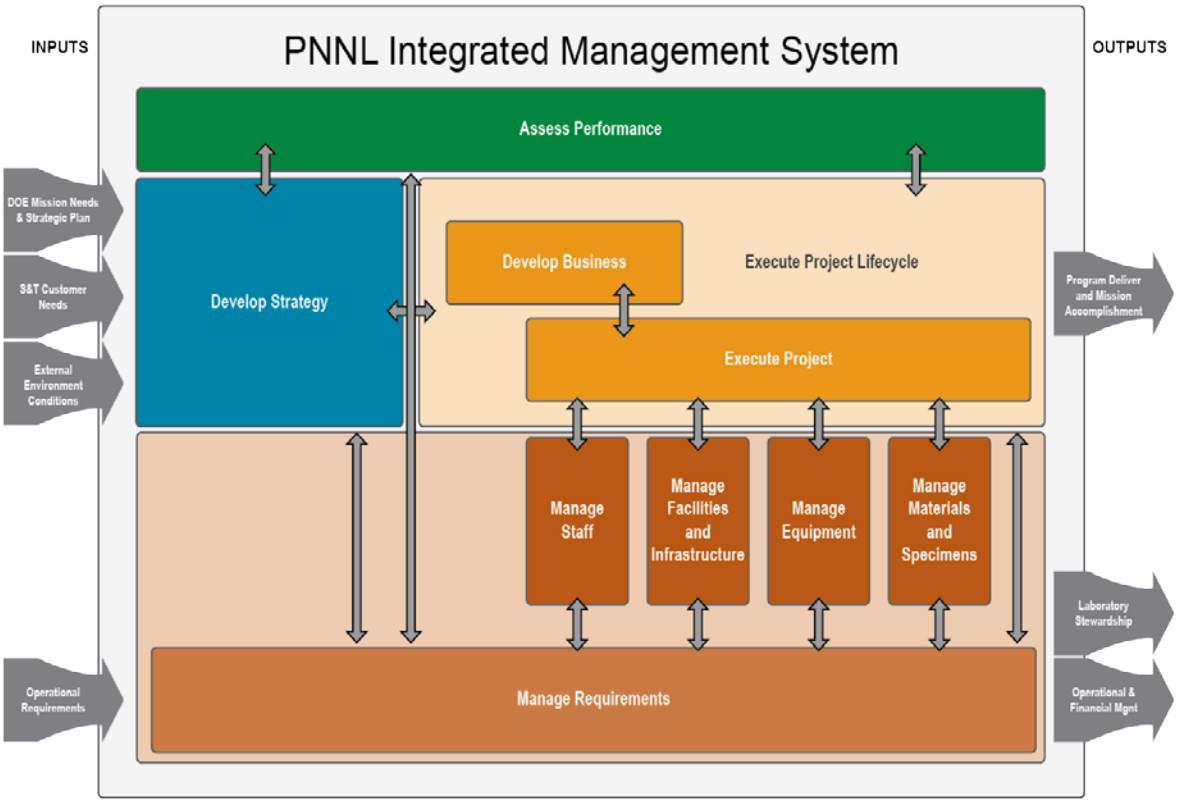

Figure 2.2. PNNL Integrated Management System

PNNL uses a standards-based approach for managing requirements and other inputs associated with common business functions. M&O programs help translate strategy, requirements, best management practices, etc. to enable the conduct of research. Various inputs are analyzed for applicability then implemented and deployed to assure compliance, as well as effective and efficient delivery to the customer. People (e.g., SMEs), systems (e.g., information technology applications), and processes (e.g., How Do I? [HDI] workflows) are utilized by the M&O programs to implement applicable requirements. Performance indicators are tracked by M&O programs to indicate extent of deployment of requirements.

The Laboratory's robust integrated performance management process includes a regular analysis of the key elements of the IMS; CBP performance, which focuses on the effectiveness and efficiency of the process; and M&O program performance, which focuses on the extent to which the programs' requirements are adequately deployed across the Laboratory. Some performance measures from the integrated performance management process are incorporated into the Operational Excellence Culture indexes as depicted in Appendix C.

2.5 VPP Focus Group Interviews

Five focus group discussions were held in March 2012. Four of the focus groups represented a mixture of research and operations personnel from across the Laboratory and one group consisted of bargaining unit employees. The group size ranged from seven to eleven participants. Approximately 45 employees participated in the focus groups. The sessions were scheduled for 90 minutes, although the level of participation was such that several of the discussions all ran over the allotted time. Specifically, the

purpose of the interviews was to gauge staff awareness and understanding of their rights, responsibilities, and opportunities for engagement in terms of PNNL's operational culture. Key issues identified from this evaluation have been incorporated into the analysis described in Section 3 to identify important cultural assumptions held by Laboratory staff.

2.6 Goals

The Gallup® professional, scientific, and technical service database (Q^{12}) was used as one benchmark for some of the Operational Culture Survey questions based on correlation to established Q^{12} questions (additional detail in Appendix B, Section B.3). Based on discussion with Gallup, this database was chosen because it contains companies that provide services similar to those of the Laboratory. Targets for the percent of strongly agree (percent of 5s) responses were set as follows:

Outstanding target set at the 75th percentile World class target set at the 90th percentile.

Operational Culture Survey questions focused on safety priority, incident prevention, and empowerment, and the results of survey data collected from research performed from 1995 to 1998 through the Rotman School of Management at the University of Toronto ([Stewart 2001) were used (Appendix C, Section C.3 as a benchmark). Targets were set as follows:

Outstanding target set at safe company average World class target set at best result.

3.0 Analysis

To provide a general overview of the Laboratory's progress toward achieving many of the attributes of an outstanding culture of operational excellence, a culture index was built to match the Credo (Figure 3.1; Appendix C). The index is not intended to replace detailed analysis of staff survey results, focus group interviews, and other Laboratory-level performance management processes but rather provides validation for the analysis.

Figure 3.1. 2012 Operations Excellence Index by Theme

Figure 3.1 graphically shows the Laboratory's performance, with the value of 1.0 representing the "outstanding" level. The text that follows identifies organizational strengths and areas for improvement. Performance in each of the four operational excellence culture themes remains strong and improvements have been made to align data sets with objectives of the Credo for Operational Excellence. Table 3.1 provides a summary of observations from the data analysis and commitments to improve.

Table 3.1. Summary of Observations/Commitments

Observation	Commitment
Leadership	
1. The majority of staff feel their concerns are respected and addressed; however, perceived overreaction discourages some staff from raising concerns.	N/A. Continue to monitor.
2. Reporting culture remains strong with opportunity to improve reporting minor issues.	Conduct focus group/SCWE self assessment.
3. Management visibility and accessibility is strong and continues to improve.	Conduct focus group/SCWE self assessment.
4. The cognizant space manager role is well respected and highly valued; however, challenges still exist that could affect safety.	Actions to be determined by Extent of Cause review
5. Accomplishing work safely is a strong priority for management.	N/A. Continue to monitor.
6. Staff reward and recognition program for safety, sustainability, security was recently consolidated and streamlined and appears effective.	N/A. Continue to monitor.
Risk Management	
1. The Laboratory's risk management portfolio comprehensively evaluates risk at all levels within the organization with continuous improvements identified.	Re-engineer/deploy streamlined risk management process for project execution Develop chartered Process Safety Board Manage/inventory materials based on hazard
2. Weaknesses have surfaced in management's analysis, acceptance, and tolerance of risk. 3. Staff expected to do more with less increases potential risk.	Actions to be determined by Extent of Cause review
4. Procurement and contract work control oversight processes have improved.	Develop and institutionalize risk-based subcontractor oversight model
5. Corrective action management is strong and continues to improve.	N/A. Continue to monitor.
Continuous Improvement	
1. Transition to new services maximizes operational performance.	N/A. Continue to monitor.
2. Organizational learning is strong.	N/A. Continue to monitor.
3. The Predictive Model is an innovative leading indicator to predict a work group's likelihood for future adverse events.	Mature a process that considers staff engagement, high risk activities and operating experience to reduce workgroup incidents.
4. Training improvements enhance efficiency and effectiveness for staff.	Right sizing 50% of the most impactful EHS&S Training courses.
5. Performance monitoring is strong with line management involvement.	N/A. Continue to monitor.
6. Staff awareness/use of venues to raise safety concerns varies throughout the organization.	Continue to increase awareness of the DSOCS. Conduct focus group/SCWE self assessment.

Table 3.1. (contd)

Observation	Commitment
Engagement	
1. Bureaucracy encourages staff work-arounds	Develop updates and efficiencies for selected IOPS permits.
2. Roadshow improvements expand student awareness of the requirements and Lab culture	Evaluate and implement suggestions to improve Student Roadshow for 2013.
3. Engaging staff in sustainability initiatives enhances worker satisfaction	N/A. Continue to monitor.
4. Participation in ergonomics and wellness activities continue to improve	N/A. Continue to monitor.
Additional Planned Improvements	• Continue to promote and communicate parking lot and pedestrian safety. • Improve Operational Culture Survey response rate by sharing results with Laboratory staff and communicate improvements made as a result of input. • Improve Sequim staff awareness and participation in VPP activities. • Implement a process for staff to perform home safety assessments with their families

In 2011, measures and indicators within the index were significantly revised to include new staff survey questions on leadership/research staff sentiment, human resources data, and core business process metrics. Additional changes were made in 2012 to incorporate new core business process metrics. The changes have strengthened the index and caused some of the numerical values of theme areas to change significantly from the previous year. The change is expected as we continue to develop a strong set of indicators and benchmarks that best reflect our aspirations for operational excellence. In the coming years as the index elements stabilize, they will be used to detect trends in our operational culture.

The following analysis of performance clearly indicates strong safety and operational culture. Results demonstrate the Laboratory is on a path for continued improvement, and we compare favorably with our benchmarked standards. The 2012 report suggested that the distribution of certain staff survey data warrants a closer examination of the “outliers” of staff sentiment/performance to determine areas where subculture beliefs, assumptions, and bias may put the Laboratory at greater risk for an event. During FY 2012, PNNL developed a management tool to predict and act on attributes of risk, staff engagement and performance that increase workgroup potential for an operational accident. A pilot was performed with nine of the highest “at-risk” work groups to gain a better understanding of the factors driving risk and, if necessary, identify actions that could be taken to mitigate the likelihood and severity of an operational incident. Feedback on application of the predictive process was positive and the model will be enhanced and rolled out across the Laboratory in FY 2013.

3.1 Leadership

In the area of leadership, the analysis of survey results, Laboratory-level indicators, and other metrics shows strong operational performance while identifying continuous improvement actions. Management’s visibility in the workplace, commitment to accomplishing work safely and encouraging reporting of

concerns generally continues to be strong. Over the past 2 years, the staff survey has revealed a common theme of staff reluctance to report minor incidents or concerns about their work environment because of overreaction and /or being seen in a negative light. This perception held by a minority of staff potentially impacts the Laboratory's effectiveness at raising and resolving concerns.

The majority of staff feel their concerns are respected and addressed; however, perceived overreaction discourages some staff from raising concerns. During Q4 of 2012, survey results showed 38 percent of respondents strongly agreed with the statement "my concerns are respected and addressed," which is above the Gallup benchmark for outstanding performance.

There continues to be a minority of staff that indicate their concerns were either not respected, not addressed, or both. Comments from both the Research Sentiment Survey and Operational Culture survey indicate that some staff still perceive responses to safety-related issues as an overreaction and waste of resources. They cite the cost of this resource and question the value, as indicated by the following example comment:

- "Reporting concerns is necessary but sometimes subjects the person who reports them to a lot of meetings, paperwork, etc., which can discourage one from reporting again."

Reporting culture remains strong with an opportunity to improve reporting minor issues. For the past 2 years, there has been a statistically significant downward trend in 375-2400 reporting. Detailed analyses indicates that the greatest factor affecting the decrease was the transition from older 300 Area facilities to the Physical Sciences Facilities. After the transition to the new facilities the average number of 2400 calls dropped by 6 per month. Analysis concluded that the decrease was a valid reflection of the improved working environment and that the reporting culture remains strong. The Laboratory's analysis of reporting culture is supported by 91 percent of survey respondents either agreeing or strongly agreeing that they are encouraged to report concerns even when no harm is done. Feedback from the 2012 focus group participants indicated they were very familiar with dialing 2400 for safety events. There appears to be little hesitation to report safety-related events. Many examples were given of a variety of topics reported. There appears to be good discussion with line managers or CSM when it was not clear whether to report an event. Participants were less sure about the reporting processes for non-safety related events (e.g., security or quality). Some reported using the 2400 line, but others were uncertain.

Focus group participants reported that they are encouraged to report minor events and near-misses; however most reported that there is a concern that reporting minor events will reflect poorly upon them. Participants stated that it is easy to report minor events in which one is not personally involved, but there is hesitation to report personal minor events. Participants also reported a hesitancy to report minor non-safety events because "when we make mistakes, we end up in a fact-finding meeting."

Although the reporting culture appears strong, feedback from staff survey indicate there are individuals that do not feel comfortable reporting minor issues as shown by the following example comments:

- "It seems employees are highly apprehensive to call 2400 for the little things. Mainly the fear is that they will get in trouble."

- "The lab has a policy to report/discuss concerns when no harm is done, but in practice there seems to be stigma associated with reporting these things to the Project Management/Project Management Offices (PMOs) if it is perceived to slow things down. This is especially true in larger projects."
- "There's a perception that reporting concerns will have negative consequences."

Management visibility and accessibility is strong and continues to improve. Staff feedback continues to support a strong management presence in the workplace. Data collected for the four quarters of 2012 show a significant increase in the strongly agree response (36%, an increase from 26% in 2010) to management visiting the workplace on a routine basis. Staff sentiment in this area approaches our benchmark for outstanding performance. Interestingly, this question also had the highest percentage of staff disagreeing, which appears to be primarily from staff working in remote locations based on survey comments.

The cognizant space manager role is well respected and highly valued, however challenges still exist that could affect safety. Specific feedback from the 2012 focus groups indicated the role of the cognizant space manager (CSM) is well received, and those interviewed reported receiving management support, even when stopping a researcher's work was required. However, several recent events and comments in the Operational Culture survey indicate competing pressure for CSMs regarding funding and authorities. For example, one commenter noted that because "CSMs are usually junior and they must fill in the majority of their time on projects, it does not behoove the CSM to upset the senior researchers." An extent of cause review is being conducted to determine the cultural drivers that influence management decisions regarding risk and corrective actions are ongoing.

Accomplishing work safely is a strong priority for management: The combined strongly agree and agree responses remain high at 89 percent to the question "My supervisor's first priority is accomplishing our work safely." When the top two box data are compared with benchmark core value safety data, PNNL continues to rank favorably with the safest world class companies (Stewart 2001). Survey comments reflect that staff believe there are other priorities (i.e., security and ethics) that are just as important as safety given the type of work that they do, and a small minority of staff feel that the organization places more value on getting the job done. Example survey comments include:

- "Ethical accomplishment of work comes first, then safety"
- "Security is a first priority - safety is second (office environment)."
- "No – my first priority is good science, which when done correctly, will be safe!"
- "Security is first priority - safety is second (office environment). Threats to us, assets, programs, etc. is a very high issue that must be addressed first hand."

Staff reward and recognition program for safety, sustainability, security was recently consolidated and streamlined and appears effective. Last year's report pointed out the limited effectiveness of multiple standalone programmatic incentive programs such as Safety Sleuth and Pollution Prevention. To reach a broader audience and provide a single avenue for instant recognition in 2012 the safety, sustainability, security awards were consolidated under a centralized recognition program "Recognize Excellence in Everyday Work." The process was intentionally made simple with no complex review process or paperwork to fill out. Each time a new recognition is posted on the Operational Excellence website the recipient receives a gift of appreciation and the recognition is also highlighted in Inside

PNNL. The new process appears to be catching on. Since its launch in October 2012, 55 staff members have been recognized.

3.2 Risk Management

Risk management continues to meet our goal for outstanding performance. The Laboratory's enterprise risk management approach comprehensively evaluates risk throughout the organization. PNNL efforts to better identify hazards and manage risk include acknowledging that staff are doing "more with less," maturing risk management methods, improving hazard assessment and improving procurement/ contract oversight processes.

The Laboratory's risk management portfolio comprehensively evaluates risk at all levels within the organization with continuous improvements identified. The CAS helps to assure mission accomplishment; protection of the workers, the public, and the environment; and fostering the efficient and effective functioning of operational, facility, and business systems while meeting applicable contract requirements and achieving science and technology goals. Assurance processes including staff R2A2s and tools exist at all levels of the organization and remain robust in identifying risk areas and managing them effectively and efficiently.

Managing Risk at the Enterprise Level: The contractor assurance processes provide confidence that products, services, and operations are meeting business objectives and customer expectations. IMS improvements and the associated Core Business Process (CBP) performance are monitored. In addition, the Executive Committee has developed an enterprise risk register that contains high level risks that are tracked and monitored. Each of the risks on the enterprise risk register has a steward and is updated during the trimester performance review cycle. The risks are predominately Strategic or Mega risks, but do include a few Compliance and Operational risks. Collectively, this risk register represents the highest risks at the Laboratory.

Managing Risk at the Program Level: Risk and performance profiles for environmental; radiation protection; worker, safety, and health (WS&H); and safeguards and security programs were further institutionalized and matured during 2012. Essential quantitative and qualitative indicators are in place for all associated programs and are incorporated into processes for evaluating performance. In addition to reporting performance, heat maps are being used for budget/resource planning, assessment planning (for both PNNL and Pacific Northwest Site Office [PNSO]) and focusing SME efforts.

Managing Risk at the Project Level: Processes and tools to facilitate risk management are embedded throughout proposal, planning, and conducting, and closing project work phases via Electronic Prep and Risk (EPR). PMO project reviews continue to show strong portfolio performance with 99% of projects demonstrating that risks are adequately defined and controlled.

User feedback on the EPR tool indicates staff frustration and lack of integration with other systems. An effort is underway in 2013 to enhance EPR to improve the effectiveness and efficiency of the EPR tool by removing work from the system, enhancing risk management at the lab, and helping to identify those projects that require additional attention earlier in the process (e.g., process safety like risks). Improvements to the tool have been developed and reviewed by many stakeholders, including the project management office directors. In addition to the improvements to the EPR tool, adjustments in the R2A2s associated with reviewing projects is underway to enable the early

engagement of the right SME involvement in project planning. This improvement to risk identified via EPR enhancement and evaluating process safety like risks are identified as a commitments in Section 4.0.

Managing Risk at the Facility Level: Facility Use Agreements (FUAs) and associated facility management procedures are used to manage risks at the facility level. Hazardous material inventory control systems and periodic facility inventory assessments are used to manage radioactive materials and chemicals for each facility. A comprehensive assessment of the radioactive material management in PNNL facilities via the Radioactive Material Tracking (RMT) tool and relationship to the FUAs concluded that these materials are being managing appropriately in accordance with DOE nuclear safety requirements and the FUAs. The Materials and Specimens Risk index for the end of FY 2012 is at 0.54 (target <1.0) indicating hazardous materials management is being effectively implemented. Improvements are being made to increase the efficiency of managing materials based on hazard (e.g., integration of operational significance policies and radio frequency identification technology). This improvement in the efficiency of managing chemicals is identified as a commitment in Section 4.0.

Managing Risk at the Activity Level: Managing risk at the activity level is performed via Integrated Operations System (IOPS), off-site work controls, and the Facilities and Operations (F&O) work practices.

- IOPS remains an effective tool for managing activity level work. An IOPS governance committee oversees IOPS performance and improvements. Metrics indicate overall good performance with completion of reading assignments (99.9%) and quality Hazard Awareness Summaries (95.8%). Other metrics have identified opportunities for improvement including overdue permits (91.2%). Efforts were made in 2012 to incorporate user feedback and improve the IOPS permits process by adding several features (e.g., improved user interface with drop down lists, new “Help Me Determine” tool, eliminated and consolidated permit fields, and improved collaboration and notifications). The CSM newsletter is used to communicate changes and request feedback.
- Work in Non-IOPS locations is controlled via Off-site Risk Mitigation Plans and Subject Matter Expert reviews. Assessments are conducted using a risk-based approach. Results of non-IOPS assessments performed indicate effective risk identification and mitigation of off-site work.
- F&O work has a robust work planning process. However, recent events identified complacency in work planning and execution and corrective actions are being implemented. F&O Work planning and control procedures, IT tools and execution enhancements and improvements are a focus area for 2013. PNNL leadership takes events seriously and is monitoring the complacency risk on the enterprise risk register.

Weaknesses have surfaced in management’s analysis, acceptance and tolerance of risk. During the past year, two events highlighted the need for improvement in risk analysis, acceptance and tolerance by staff in leadership positions. In both cases, staff made decisions based on their assumptions. Their decisions ultimately created hazardous working environments and potential chemical exposure of staff.

In the first event, a visiting scientist’s unsafe work practices resulted in a chemical exposure to a staff member. In this case management relied on the CSM and mentor to oversee the scientist’s activities.

In the second event, management's tolerance of procedural inadequacies and subsequent lack of response to staff concerns lead to the potential exposure of two staff. In this case, management and staff relied on professional judgment and expertise rather than established processes and procedures.

An extent of cause review is being conducted to determine the cultural drivers that influence management decisions regarding risk and corrective actions are ongoing.

Staff expected to do more with less increases potential risk. In early 2012, PNNL, initiated workforce restructuring actions to address reductions in programmatic funding and to prepare more adequately for an uncertain FY 2013 funding environment. The restructuring effort reduced the workforce by 212 people in 2012. These budget challenges required the Laboratory to be extremely lean and efficient in the way that we deliver services and manage projects. Many times these efficiencies are asking staff to do more with less and can increase the potential for error.

In anticipation of the restructuring, risk-based changes were made to reduce costs while continuing to safely and reliably meet the needs of research. Examples include reducing environmental and radiation protection program support and reducing overtime costs by performing more maintenance and construction activities on dayshift and adjusting certain craft shift coverage (e.g., power operators).

At the same time, the nationwide uncertainty in funding has caused researchers to lose project funding. Pressure on research staff to obtain funding, comply with requirements, and conduct high quality research with limited resources often forces them to take on multiple roles (e.g., Technical Oversight Representatives [TORs], CSM, researcher, sales). Key staff are often overworked and unavailable.

Feedback from 2012 focus groups relayed concerns over the effect of limited resources on quality of work. Specifically, as budgets are reduced, quality suffers because there is no time or money to check the work, and smaller projects are less likely to use the quality SMEs because of the cost.

Feedback from staff survey reflected similar concern as depicted by the following example comments:

- "As everywhere we are asking our technicians to do more with less. More work, same staffing stretches people thin, work does not get done in timely manner and milestones can be missed."
- "At this point all support must be paid for directly by the project (i.e., no lab level funding or support) so we have had to eliminate almost all use of additional resources within the lab in favor of being able to fund the staff required to conduct the actual task...hands on part of the process."

Procurement and contract work control oversight processes have improved. PNNL has improved subcontractor controls, particularly for laboratory suppliers. PNNL changed from managing the contracts with Technical Administrators (TA) to TORs. There are four TOR credential levels: TOR-1, TOR-2, TOR-3, and TOR-Offsite (TOR-O). Staff members with the TOR-1, 2, and 3 credentials are limited to oversight of procurements involving on-site work (i.e., PNNL Work Sites). While TOR-Os are limited to oversight of procurements involving off-site work (i.e., non-PNNL Work Sites including DOE-owned or controlled sites). TORs are also limited to overseeing procurements within their approved Cognizant Areas (i.e., PMOs and Divisions within the Laboratory). Further, TOR-1s are authorized to oversee procurement of goods and services that do not involve hands on work (e.g., equipment, supplies, meetings, conferences, lectures). TOR-2s have TOR-1 authority and may also oversee procurements involving non-construction hands on work (e.g., repairs, calibrations, maintenance). TOR-3s have TOR-1

and TOR-2 authority and may also oversee procurements involving construction activities. Finally, TOR-Os are authorized to oversee any type of offsite work (e.g., repairs, calibrations, construction, equipment purchases).

TORs are now held accountable for providing appropriate oversight of subcontractor work (on and off site) and also provide the technical expertise for determination and documentation of acquisitions requirements, risks, acceptable deliveries, payment and contract closeout. For on-site work, the TORs are responsible for completing an Acquisition Hazard Assessment and working with the appropriate WS&H representative.

In addition to increased involvement by the TOR, PNNL improved the training for contractors performing work on laboratory equipment. PNNL developed a training video for both contractors and laboratory personnel requesting contractor support that reinforces the need to follow procedures and processes that ensure contractors follow the PNNL expectations for performing work safely in PNNL workspaces. The video clearly demonstrates both the right and wrong way to obtain contractor support, the need to involve the CSM, the building manager, the building engineer, and the TOR, and communicates the message in an engaging and interesting format. No incidents have been reported under the new system, however, more run time is needed to assess effectiveness of improvements.

Corrective action management is strong and continues to be monitored. The Laboratory's self-assessment process is aimed at finding smaller issues early and getting them fixed in a timely manner. Program self-assessments are performed on a routine basis to verify deployment of requirements and any identified issues are tracked. Self-assessments conducted in IOPS spaces create actions or "Must Do" items which are tracked and monitored to closure, all within IOPS. Although performance for the "Must Do" items is currently below target (90.9% vs. the target of 95%), targeted improvements are underway. Timely management of Issues and Actions is a key element of PNNL's CAS. Data indicate when issues are reported into the Laboratory's corrective action management systems they are closed in a timely manner. The trend for overdue actions, timely documentation, and obtaining assistant laboratory director (ALD) approval when the 9-month closure date cannot be met are good, and performance is monitored monthly.

3.3 Continuous Improvement

Indicators of continuous improvement demonstrate strong performance. The Laboratory's robust operating experience program, wholesale improvements in radiological and occupational medicine services and participation in the Battelle Affiliated Laboratory's Communities of Practice reflect a healthy learning organization.

Transition to new services maximizes operational performance. Several services were transitioned in 2012 to improve operational efficiency, and effectiveness.

- The Radiological Site Services transition for the PNNL External and Internal Dosimetry programs to self management with external vendors has resulted in a more tailored, cost effective approach that best supports the Laboratory's current and longer term mission. Coupled with this transition is a novel, optimized method for determining need for bioassay that is hazard- and threshold-based instead of the confirmatory approach now used. These changes will result in a significant reduction in

overall Dosimetry Program costs starting in FY 2014 (>$500K) per year across the Laboratory compared to procurements through Hanford Site Services.

- Beginning October 1, 2012, PNNL established an on-site Occupational Health/Medical Clinic. The previous occupational health service was provided by the Hanford Occupational Medicine contractor that provides services to several other contractors on the Hanford site at a facility approximately 4 miles from the core PNNL campus. The change to an on-site PNNL occupational medicine contractor has resulted in several positive outcomes for PNNL which are identified below:
  - Occupational medical examinations can now be scheduled with shorter lead time. This helps with emergent work or needs that may occur on short notice
  - The location of the OH clinic is on the PNNL campus minimizes the amount of travel time.
  - There are shorter "wait times" for staff that require OH care on a walk-in basis such as for return to work exams and work injury care.
  - The ability to design occupational health services to meet PNNL needs is now easier. The prior services were standardized, addressed a workforce engaged in clean-up activities, and had little room for flexibility or customized program design. For example, we can customize how staff are assigned into medical surveillance programs based on risk ranking, and "return to work" evaluations can be scheduled a day or two ahead of the actual return date.

As part of PNNL's transition to an occupational health services provider, we transitioned to a new web-based Employee Job Task Analysis (EJTA) Tool used to capture potential exposure and physical hazards of staff; catalogue essential job functions; and enroll staff in medical qualification and surveillance examinations. The new tool is intended to streamline the EJTA process by using a more simple method for determining frequency of exposure and utilizing electronic workflow and approval functions. Due to unforeseen problems with the new database, EJTA completion rates for staff in medical qualification and surveillance programs are lower than expected. Efforts are underway to resolve these issues.

Organizational learning is strong. The Laboratory learns from the experiences of others both inside and outside the organization and is actively engaged in communities of practice that share information and reinforce mutual learning.

- *Operating Experience/Lessons Learned*: The OE/LL is well integrated into the Laboratory's processes and accessed by a large cross section of staff, as evidenced by 5 years of strong growth in readership. During 2012, 90% of all staff in the Laboratory accessed and read at least one article. Articles are written in partnership with PNNL managers to share experiences and lessons across the Laboratory. In 2012, 85% of all PNNL-based articles were developed based on managers' desire to share the information and promote learning from others' experiences. The OE Program continues to broaden content and delivery mechanisms by delivering targeted OE/LL articles through HDI work controls, workflows and through training, providing a Laboratory resource with social software and networking tools for quick access/discussion among staff and managers, and partnering with M&O programs to more effectively use OE/LL capabilities to support learning and continuous improvement goals. Pathways to lessons learned are expanding. During FY 2013Q1, 30% of all access to the OE/LL website came from training. This was a dramatic increase over previous levels. The ability for staff to search and explore lessons learned information has been significantly expanded through the development of an innovative, PNNL research-based search engine called Lessons Learned Explorer (LLEx). Through visualization and text analytics, LLEx offers new ways to explore and find

lessons learned articles, based on content and combinations of multiple attributes such as topics, tags, and types. Inside PNNL access was at 53%, as staff continue to discover new access points through HDI, LLex, and training.

- *Learning from External Events*: The PNNL Independent Oversight group conducted a study to identify the organizational practices that help PNNL successfully learn from significant external events. Thirty-four staff from the research and development (R&D) directorates and selected M&O programs were interviewed and 17 external events were reviewed. Results showed that expectations are well understood (although largely informal), data streams for identifying events are well established, a graded approach is used to analyze and act upon events, and a robust operating experience program for communicating lessons learned is in place. For example, PNNL took several actions after they learned about a lathe fatality at Yale University, including updating the intern handbook, conducting special meetings with operations managers, and assessed machine shop guarding conditions.
- *Brown Bags*: EHS&S has established a biennial brown bag series that hosts prominent speakers from industry and the university community to benchmark and share information related to human performance and organizational culture. In March 2012, Dr. John Winn, Dartmouth College, spoke about the tragic death of a colleague working with dimethyl mercury and the importance of a questioning attitude. In November 2012, Dr. Alice Young Texas Tech University shared lessons learned from an explosion that seriously injured a graduate student and steps that the university is taking to strengthen their safety culture.
- *Emergency Preparedness*: In 2012 Emergency Preparedness conducted the first lockdown drill simulating an active shooter event. The drill was a test of the Laboratory's proximity card-deactivation and staff-notification systems as well as an evaluation of staff member response. Actions were identified to enhance physical campus security and to streamline the Communicator Notification System to alert staff members more quickly.
- *Team Sharing*: The 2012 Focus group participants indicated within their teams there is great deal of sharing of information; example a frayed cord that needs fixed, or recognition of expired chemicals. Another example given was when an individual received a shock from a piece of foreign equipment and took time during project meeting to share lessons learned.
- *Awareness Videos*: Four one minute video segments were produced to raise Laboratory staff awareness of specific requirements and work practices associated with pressure and ventilation. The series is titled Enabling You and the videos were published as part of the Laboratory's OE Program, which has a tremendous readership rate of more than 80 percent.
- *External Committees*: PNNL's commitment to learning and sharing from operating experience and impact extends beyond the Laboratory. Mutual learning is being driven throughout Battelle via the Communities of Practice, Hanford Site Champions, and the DOE EFCOG working group committees (e.g., F&O, ISM). In addition, other learning comes from ad hoc benchmarking efforts. For example, several organizations have visited PNNL to benchmark the methodology for measuring culture.

The Predictive Model is an Innovative Leading Indicator to Predict a Work Group's Likelihood for Future Adverse Events. During FY 2012, a predictive model was constructed to identify workgroups at highest risk for a catastrophic event based on four aspects: work group size, exposure to high risk hazards, worker engagement and operating experience. By identifying those work groups at highest risk,

management can focus their attention and take action to thoroughly understand the factors driving risk and determine whether or not appropriate mitigations are in place. A pilot was performed with nine of the highest "at-risk" work groups in the Laboratory to gain a better understanding of the factors driving risk and, if necessary, identify actions that could be taken to mitigate the likelihood and severity of an operational incident. Each of the pilot participants felt that some or part of the information discussed during the pilot process reaffirmed what management was already aware of and for several participants it validated ongoing efforts to reduce incidents. The approach was thought to be a useful tool to raise the awareness of managers. All agreed that the unique combination of experiential and behavioral data added a dimension that provided them with a more complete view of risk and that the 3-year capture of operating experience (incidents) was useful to detect subtle patterns. PNNL's innovative approach to predicting a work group's likelihood for future adverse events was approved for Laboratory-wide deployment in 2013 by the PNNL's Executive Committee.

Training Improvements Enhance Efficiency and Effectiveness. Staff frustration with training has been a consistent theme in surveys over the past several years. For the past 2 years, PNNL's Training Information Services (TIS) has been implementing a plan to improve training efficiency by consolidating redundant material and updating it annually to keep the content relevant and interesting. Examples of improvements made in 2012 include:

- Significant changes were made to the Laboratory required refresher training that reduced training time and improved the staff experience.
- Changed Respiratory Program from external to being performed internally. In support of this protocol, all elements of the Respiratory Protection Program have been adjusted and course coded for alignment accuracy and efficient field readiness. Changes have significantly reduction in staff training time (~8 hrs down to 2.5), and remedied a prevalent trend to take initial training, then failure to finish the qualification with actual mask fitting.
- Content of Non-Electrical Worker training updated to be more focused along with a significant reduction in required participants, thereby reducing Laboratory staff labor time.
- Training for non-staff was streamlined by removing content that was not applicable and combining three separate courses into one course.

Feedback from 2012 surveys indicate that staff are generally pleased with the direction training is heading but continue to experience frustration with the effectiveness and efficiency of several courses, as evident by the following comments:

- "Training has improved and is now not so disruptive or tedious."
- "Lots of training that is mandatory that really does not apply to me and my group. However, the training materials are efficient and effective."
- "Training is only effective up to a certain point. The number of online trainings and reading required are such that retention/comprehension is reduced."

Additional efforts to continue to reduce staff frustrations and improve research productivity by right sizing training courses are planned for 2013 as described in Section 4.0.

Performance monitoring is strong with line management involvement. Performance monitoring occurs at many levels as described previously in conjunction with contractor assurance. M&O PMs examine their performance regularly with performance analysis that includes a status of requirements and documentation, the effectiveness and efficiency of the system, overall performance, and emerging issues and trends. Emerging issues and risks are reviewed with the Executive Committee. Line managers are directly involved in oversight and performance improvement through activity-based observations and space-based walk-throughs. Data from the Operational Excellence survey indicates that 89% of respondents strongly agree or agree that their supervisor understands how their work is performed, and 80% strongly agree or agree that their supervisor makes sure their work is performed as planned. Other examples of line management involvement are described below.

- *IOPS hazard assessment enhanced capabilities to better target risk*. In 2012, the IOPS Explorer tool was developed. The tool visually displays IOPS information in an easy-to-use web-based format that focuses on IOPS spaces, assessment of IOPS spaces and hazards within spaces. Operational performance about each IOPS space can be combined with information on inherent risk in each space to produce a heat map that displays potentially higher risk IOPS spaces. Management can use the tool to identify higher risk spaces that might be good candidates for increased number of targeted, risk-based assessments and increased management attention. .
- *Peer reviews conducted in high risk laboratories*: The Lab Director commissioned an effort to conduct peer reviews in laboratories with high risk operations in six buildings. Teams were formed that included Operations Managers, WS&H representatives, Environmental Compliance Representatives (ECRs), Building Managers and other subject matter experts (SMEs) as needed based on work in these facilities. There were no significant issues identified, however, there were some minor issues identified and these issues are being addressed. Some of the common issues identified in all six facilities included housekeeping, chemical storage, and compressed gas cylinder storage.
- *WS&H performance summary*: Performance data is being communicated across all levels of the organization. For example, WS&H prepares a performance summary every trimester for each directorate and the LSOC known as a Quad Chart, which articulates safety statistics, events, accomplishments, and emerging issues for that particular directorate.

Staff awareness/use of venues to raise safety concerns varies throughout the organization. Venues to raise safety concerns include reporting to management, reporting to DSOCs, and reporting to the Employee Concerns Program.

- *Reporting to Management*: 2012 Focus group participants all quickly volunteered that they report concerns and issues to their line managers. All reported that their immediate supervision quickly addressed issues that were within their span of control. ES&H staff was also referenced as a resource for addressing concerns. The 2012 VPP DOE on-site review validated that both bargaining and non-bargaining staff interviewed regarded open communication as an effective means of resolving their concerns.

- *Reporting to DSOCS*: DSOCs are an open forum for employees and managers to raise and resolve safety and operational issues and challenges. The goal of the DSOCs is to improve performance through communications, staff/ management interactions, and increase awareness. A review of DSOC activity over the past 2 years endorses their role in sharing information and discussing and addressing concerns. In the last year, presentations included a variety of topics: workplace violence, back to

school safety, winter driving, emergency assistance on travel, and fire safety in research laboratories. Many concerns discussed and addressed involved parking lot and foot traffic safety, including the location of a stop sign, parking lot visibility, and lighting between buildings. Other topics of concern were inconsistency in policy for safety glasses in the laboratory and guidance for rest during long hours of travel. Example resolutions are:

- replacing solid wood doors with new doors having glass inserts to help avoid accidents due to lack of visibility to oncoming staff
- distributing flash lights to staff traveling between Environmental Molecular Sciences Laboratory (EMSL) and the Biological Sciences Facility (BSF) in the dark until the Laboratory implements a permanent fix
- modifying some drinking fountains to allow the filling of water bottles more easily and reducing the number of bottles being recycled.

Data collected from the Operational Culture Survey for the four quarters of 2012 showed 43 percent of staff were not aware of the DSOC, potentially leaving a significant number of Laboratory staff unaware of an important resource.

- *Reporting to Employee Concerns Program (ECP*): When resolution of a concern at the management level is not possible, the ECP is available for staff members to raise issues and concerns without fear of harassment, retaliation, intimidation, discrimination, or disciplinary action. The Independent Oversight group assessed PNNL's Employee Concerns Program (November 2012) and concluded that generally staff were aware of the overall ECP mission and recommended increased outreach materials and communications. Interviews with former users of the ECP process indicated an overall positive experience with using the program. They indicated that the ECP manager was professional, highly responsive and easily assessable.

3.4 Engagement

Staff engagement in Laboratory work planning, hazard assessment, wellness, and sustainability activities continues to grow and improve. The 2012 VPP DOE on-site review validated through field observation and interview that PNNL staff remains committed to their own personal health and safety as well as that of coworkers, visitors, and the community. Despite these positive indications, feedback from staff on the operational excellence and research productivity sentiment surveys indicate that engagement is negatively affected by the perception of excessive bureaucracy that encourages work-arounds. The VPP Steering Committee has additional improvements planned for 2013 to increase engagement as described in Section 4.0.

Bureaucracy encourages staff work-arounds. The 2012 research productivity sentiment survey comments continue to indicate that research staff are frustrated by the burden of processes and requirements. Feedback from the 2012 focus groups consistently noted that their frustrations resulted in the use of "work-arounds" to get around a requirement when it did not make sense to them or perceived as low risk. Feedback from staff survey reflected similar concern as indicated by the following example comments:

- "I worry that in some circumstances, required procedures can go too far and it may lower the willingness of staff to comply."

- "If safety measures are unreasonably burdensome or make work impossible, they are not well received or safety may not be consulted in the future."

Ongoing initiatives to streamline processes (i.e., IOPS permits) and reduce researcher frustration are expected to improve performance in this area as described in Section 4.0.

Roadshow improvements expand safety awareness of students. In 2012, VPP Roadshow sessions were enhanced to provide a more interactive forum for students to learn about PNNL's safety culture and engage in one-one-one discussions with SMEs. The roadshows emphasize expectations for questioning, reporting concerns, and requesting help to cultivate values that will extend to the student's home life, and future career settings. Improvements to the roadshows are planned for 2013 including encouraging mentors to participate by providing the opportunity to win prizes and expanding events to off-site locations as described in Section 4.0. Staff survey comments demonstrate the value of the roadshow as depicted in the following example:

- "The Safety Roadshow is critically important given that most interns have never encountered safety training/awareness at the level we have here."

Engaging staff in sustainability initiatives enhances worker satisfaction. In 2012, the Laboratory implemented a teleworking program that allows employees to work at least 1 day per week at home. This program exemplifies PNNL's commitment to environmental, social, and economic sustainability. To help telework succeed for all eligible employees, PNNL rolled out a Laboratory-wide communications campaign, manager and teleworker training, a telework community website with toolkits, FAQs and other informational resources, and access to collaboration technologies that support a distributed workforce. A survey of PNNL employees participating in the telework pilot indicated that morale and job satisfaction, work and non-work life balance, and job satisfaction increased for more than half of participants as a result of their telework experience. Over 40% said it increased their desire to stay at PNNL, suggesting a potential worker retention benefit. In addition to providing employees with greater workplace flexibility, telework saves employees time and money by avoiding a commute once per week while helping the Laboratory to achieve its greenhouse gas emission reduction goals.

Other examples of sustainable engagement include:

- Establishing an Alternative Commute Program, which includes delineating safe bike paths, having bike racks, and conducting bicycle safety seminars (how to fix a flat tire, hazards awareness course).
- Staff and their families donate thousands of hours to the community each year to benefit a variety of non-profit organizations. In 2012 alone, staff donated over 27,480 hours of their own time to strengthen our community.
- The Sustainability Pay$ Program funds projects proposed by employees that promote more sustainable practices, particularly in the areas of waste generation, energy and water conservation, and material purchasing. For example, trichloroethylene (TCE) was substituted with compatible non-halogenated solvent for a parts degreaser operation. This change achieves greater regulatory compliance; and most importantly, further reduces potential intrusion on the environment and risks to worker health.

Participation in ergonomics and wellness activities continues to improve. Office staff participation in ergonomics hazard assessment is strong and has decreased injury. Over the past 2 years, 40% of staff surveyed indicated they have had a recent ergonomics assessment and 59 percent said that ergonomic equipment/tools support working safely. During 2003–2007, PNNL averaged 16 repetitive motion incidents a year. In 5 years, the average dropped to less than five per year (4.6), and in calendar year 2012, only one repetitive motion event was reported. This reduction has increased the quality of life, both at work and home, for many staff members.

Some staff survey comments revealed positive results, while others that there is still a minority of staff are not familiar with the ergonomics program that could benefit from the service. One specific positive comment was "my Rollermouse has saved my hands from carpel tunnel."

The PNNL wellness program continued on a positive trend for during 2012. An increase in staff participation and the number of events was demonstrated throughout the year. Program highlights included the following:

- Two wellness challenges were offered to staff during 2012. The annual wellness challenge has been a popular event for staff as a way to increase engagement in healthy activities. A shorter mini-challenge was added this year which occurred in February that had a participation rate of 436 staff members.
- The annual 6-week Spring-Summer Challenge started in May and ended on July 6. This challenge had 539 participants with staff competing on teams or as individuals. Team size ranged from 2 to 10 people with 83 teams participating. The participants accumulated over 19,550 hours of exercise time.
- The Weight Watchers at Work meetings continued through 2012 on a weekly basis. On average, 20–25 staff members participated in the meetings. Historically members have lost an average of four body mass index points over 16 weeks.
- The second week in May was featured as a lab-wide Wellness Week. Each day throughout the week focused on a particular wellness topic or event such as eating fresh produce from the campus farmers market, a cancer forum, walking, bike to work day, and joining the challenge.
- Three Food for Life workshops were held on campus. These workshops featured healthy eating and cooking demonstrations aimed at preventing cancer and diabetes while promoting overall health.
- A farmers market was hosted on the campus each week during the summer months. Local farmers and growers were provided a central location each Monday afternoon for a traditional style market venue. This setting provided a convenient opportunity for staff to sample and purchase locally grown produce and fruit each week.
- The annual flu shot clinics were held in the fall. Approximately 1400 staff received flu vaccinations. This was the second year that the clinics were arranged using an appointment based system. Staff registered for appointments before the clinic which allowed for essentially no wait times during the actual clinics.
- A series of stress management workshops were provided during the months when uncertainly of layoffs were of concern. Two specific workshops were also provided to two classes of staff participating in the project management development program.

Feedback regarding wellness-related activities at PNNL during 2012 was positive as demonstrated by the following survey comments:

- "The Well4Life program was the catalyst that lead me to improve and maintain a healthy lifestyle. The program continues to be a major contributor to maintaining my nearly 70 lbs weight loss."
- "Well4Life has helped me motivate myself to improve exercise and eating habits."

4.0 Improvement Actions

The following sections include a status summary of the initiatives and improvement actions from last year's VPP evaluation. Initiatives are Laboratory- or Division-level improvements that address processes and tools. Continuous improvement actions are targeted activities led by the VPP Steering Committee. Initiatives and improvement actions work together to promote a culture of Operational Excellence. Improvement initiatives and actions planned for 2013 are also provided.

4.1 Status of 2012 Improvement Initiatives

The following Laboratory- and Division-level initiatives will address barriers to achieving a culture of Operational Excellence.

1. **Improve risk identification and mitigation process for projects initiating deployment of the streamlined risk management process for project execution. (Project Execution CBP)**

   Status: Ongoing. Due to Oracle software technical issues, this effort has been delayed and will be continued into FY 2013. The Project Execution Lifecycle (PEL) early release milestone is being renegotiated for early FY 2013. PEL Early Release User Acceptance Testing Phase 1 and 2 has been completed, and although very early indications were positive there are usability and performance issues with the tool suite. Oracle is aggressively addressing these with significant incremental resources paid for or subsidized by Oracle. PNNL/Oracle discussions are focused on identifying a realistic go/no-go early release date. Weekly Oracle Executive calls continue to alert Oracle management to issues, such as the slow performance, instability and usability. Demos have been presented to multiple stakeholders. Technical issues associated with the Oracle product have forced an alternative solution to the project risk management process. An EPR re-engineering effort was initiated in FY 2012 and will continue into FY 2013 to streamline the risk management process. This will be an ongoing commitment for FY 2013.

2. **Improve the efficiency of managing materials and specimens by utilizing hazard information to deploy the operational significance construct. (M&S CBP)**
   Status: Ongoing. A successful pilot of the operational significance construct was deployed for BSF. The ROC approved a recommendation to expand the approach Laboratory-wide. An Implementation Plan to roll-out this approach was approved in April 2012. The plan identifies the documents that need revised and describes the phased implementation approach. A communication plan has been developed and approved. Changes to procedures and HDI work controls are underway. The actual implementation of the risk-based approach to chemical management will be rolled out in two phases over a 3-year period: receive newly acquired chemicals per the risk-based approach and convert barcodes in the existing inventory to match the risk-based approach in conjunction with the Chemical Wall-to-Wall Assessment Plan. In FY13, deployment of risk based approach for management of materials will continue by integration of RFID technology for chemical inventory management as described in Table 4.1.

3. **Establish and streamline IMS configuration management by documenting the process in HDI. (Requirements Management CBP)**

   Status: Complete. Processes to manage the configuration of the IMS are in place and are being integrated and are documented in the IMS Program Description. These processes cover IMS change as follows:

   - Major IMS improvements are chartered and overseen by the ROC using a Critical Decision (CD) Stage Gate process. This process is well established and has been in use for over a year.
   - Minor improvements or system sustaining needs/requirements involving IT systems and tool are managed by the Information System Integration Council *and processes will be documented to assure requirements traceability between process and tool development.*
   - IMS changes (e.g. changes to the IMS itself – M&O Programs or CBP's) are managed by the IMS Steward within the processes and controls of the Manage Requirements CBP.

   Changes in requirements and/or their implementations (including internal operating procedures with "line of sight" to Source Requirements) are managed by Q&A Division (IMS Steward) under the Manage Requirements CBP processes and controls. These processes are in use and being refined as IMS implementation continues.

4. **Utilize risk management methodology to evaluate and improve performance indicators based on critical controls. (EHS&S)**

   Status: Complete. EHS&S Risk and Performance Profiles have been further institutionalized and matured during 2012. Essential quantitative and qualitative indicators are in place for EHS&S programs that are based on critical controls and are incorporated into processes for evaluating performance. Each division periodically evaluates impacts to the heat map risk ranking as part of performance analysis and makes adjustments to the heat map ranking if necessary. In addition to reporting performance the EHS&S heat maps are being used for budget/resource planning, assessment planning (for both PNNL and PNSO) and focusing SME efforts.

5. **Transition to a new occupational medicine provider. (EHS&S)**

   Status: Complete. Beginning October 1, 2012 PNNL established an on-site Occupational Health/Medical Clinic. The clinic makes it easier for staff to schedule and manage appointments and eliminates undue travel and wasted time.

6. **Operational Culture Survey data revealed outliers of disengagement among workers. Additional predictive modeling analysis will be performed to identify at-risk work groups.**

   Status: During FY 2012, a predictive model was constructed to identify workgroups at highest risk for a catastrophic event based on four aspects: work group size, exposure to high risk hazards, worker engagement and operating experience. By identifying those work groups at highest risk, management can focus their attention and take action to thoroughly understand the factors driving risk and determine whether or not appropriate mitigations are in place. A pilot was performed with nine of the highest "at-risk" work groups in the Laboratory to gain a better understanding of the factors driving risk and, if necessary, identify actions that could be taken to mitigate the likelihood and severity of an operational incident. Each of the pilot participants felt that some or part of the information discussed

during the pilot process reaffirmed what management was already aware of and for several participants it validated ongoing efforts to reduce incidents. The approach was thought to be a useful tool to raise the awareness of managers. All agreed that the unique combination of experiential and behavioral data added a dimension that provided them with a more complete view of risk and that the 3-year capture of operating experience (incidents) was useful to detect subtle patterns.

4.2 Status of 2012 Continuous Improvement Actions

Progress was made on all continuous improvement actions identified in the 2012-13 Operational Excellence Culture Evaluation. The VPP Steering Committee has a continuing commitment to promote staff involvement within the Laboratory.

1. **Increase awareness of the DSOCs**

   Status: Ongoing. Since the 2009 VPP review, many of the DSOCs have expanded their membership to include a more diverse cross section of their directorate. In some cases membership has rotated to allow more participation.

   Most stress the expectations for their DSOC membership to reach out and share the information with the rest of their directorate.

   > *Example (NSD)*: The Employee Group Representatives are expected to communicate to their organization the information that was presented in the DSOC meetings. "You can do that by utilizing the most effective method for the type and size of the group you will be addressing. It is recommended that the information be shared as part of a regularly scheduled safety meeting in order to promote discussion and feedback."

   Many DSOCs have involved their communications staff to raise awareness: i.e. directorate newsletters, OSD DSOC tip of the week.

2. **Increase awareness and availability of stress management tools and services (e.g., ECP, manager training, value of home/work life balance).**

   Status: Complete. A seminar series "Managing Change, Stress" was available to staff and family members via the Benefits Office in 2012. These seminars addressed techniques on managing stress, managing changes, moving forward, building employee motivation and morale. Seminars were offered in Richland and via WebEx. Nine seminars were presented in 2012 with over 50 attendees.

3. **Consolidate award/suggestion programs.**

   Status: Complete. To reach a broader audience and provide a single avenue for instant recognition, EHS&S consolidated safety, security, and sustainability awards under a centralized recognition program to "recognize excellence in everyday work." The new recognition venue was launched in fall 2012 via the Operational Excellence website. The process was intentionally made simple with no complex review process or paperwork to fill out. Each time a new recognition is posted on the Operational Excellence website the recipient receives a gift of appreciation and the recognition is also highlighted in Inside PNNL. The new process appears to be catching on. Since the program's launch, 55 staff members have been recognized.

4. **Evaluate and implement suggestions to improve Student Roadshow for 2012.**

   Status: Complete. In 2012, student survey input and SME input from the 2011 Roadshow was utilized to improve the Roadshow format. The provision of refreshments, new to 2012 VPP Roadshow sessions, provided a more congenial and interactive forum for students to learn about PNNL's safety culture and engage in one-on-one discussions with SMEs and each other, and attendance at the 2012 Roadshow was excellent, often with rooms packed to capacity. Many students noted in this year's Roadshow survey that they really appreciated the chance to talk frankly with SME's and to meet other students across the laboratory whom they might not otherwise have met. Also, mentors were encouraged to attend the 2012 Roadshow with their students, and several did so, demonstrating a commitment to operational excellence on the part of the mentor, and strengthening the mentor-student bond. The roadshows emphasize expectations for maintaining a questioning attitude, reporting concerns, requesting help whenever the student is unsure, and stopping work if necessary, if the student perceives a risk to himself/herself or to others. The aim of the Roadshow is to foster open-door communication with PNNL staff and to engage each student in PNNL operational excellence culture, thus cultivating values that will extend to the student's home life, academic life, and future career settings.

5. **Revise and update the VPP website.**

   Status: The entire VPP website was reviewed in 2012. Outdated information was removed and archived as needed. Relevant current information was integrated onto the new Operational Excellence website. The Operational Excellence approach integrates key EHS&S information and provides resources for staff via a single website. Additional efforts to provide more information externally are underway.

6. **Respond to all staff who provided comments and their names in the Operational Culture Survey.**

   Status: Ongoing. Some respondents were confused between the question asking if they wanted to be contacted and the question on whether they wanted a prize. To address this issue, the VPP administrator follows up with staff members that indicated they wish to be contacted about their responses each quarter. We may also want to reword this survey question to ask staff for permission to share comments anonymously to improve Laboratory performance.

7. **Update the format of the *Porcelain Press*.**

   Status. The format of the Porcelain Press was going to be expanded to allow more information on a single issue. It was determined that using both sides of the paper and flipping it over mid-month was more effective than increasing the size of paper. In addition to utilizing both sides, a new Operational Excellence website was launched that integrates key VPP information.

4.3 Improvements Planned for 2013

The IMS reflects Battelle's revised approach to management and operations by describing how fundamental management and operating elements (e.g., CBP and M&O programs) work together as a coherent system. A single IMS improvement plan captures major improvements related to improving effectiveness and efficiency of the IMS. Additional minor improvements are managed at the division, CBP or M&O program levels. Table 4.1 summarizes the subset of Laboratory- and Division-level improvement initiatives planned to improve operational excellence.

Table 4.1. Summary of 2013 Performance Objectives Commitments and Measures

Performance Objective	Commitments	Measures
Improve risk identification and mitigation process for projects (continued from FY 2012) to include process safety management like risks.	Re-engineer/deploy streamlined risk management process for project execution	Initiate testing of re-engineered EPR process
Institutionalize a process for evaluating process safety like risks	Develop chartered Process Safety Board	Approved Process Safety Board Charter
Improve efficiency of managing materials and specimens (continued from FY 2012)	Manage/inventory materials based on hazard	Continue deployment of operational significance construct for management of materials as demonstrated by: • Integration of RFID technology with chemical management for chemical inventory management; and • Deployment of RFID technology and operational significance model at EMSL
Increase effectiveness and efficiency of selected IOPS permits	Streamline permit process for selected IOPs permits	Develop updates for selected IOPS permits
Strengthen operational culture by maturing a predictive indicator of risk.	Mature a process that considers staff engagement, high risk activities and operating experience to reduce workgroup incidents.	Use feedback from the FY 2012 pilot to refine a predictive model and provide value-added information to workgroups at high risk for future operational incidents.
Strengthen accountability for subcontractor performance (notable outcome)	Develop and institutionalize risk-based subcontractor oversight model.	Implement improved subcontractor oversight model
Improve research productivity	Right sizing required EHS&S training courses.	Right sizing 50% of the most impactful EHS&S training courses.

In addition to the above initiatives, Table 4.2 provides a list of improvement actions that the VPP Steering Committee will champion during 2013.

Table 4.2. 2013 Continuous Improvement Actions

Theme	Discussion	Planned Action
Leadership	Survey data indicate staff are still not aware of the DSOC venue for raising concerns. Need to increase communications to and from DSOCs.	Continue to increase awareness of the DSOCs.
Risk Management		Continue to promote and communicate parking lot and pedestrian safety.
Engagement	Many survey respondents provided comments. Several of the comments are asking for "help." Following up with comments where names were provided demonstrates commitment.	Improve Sequim staff awareness and participation in VPP activities.
Continuous Improvement	Students and interns saw value in the Student Roadshow held in 2012. Suggestions to improve the event were gathered.	Improve Operational Culture Survey response rate by sharing results with Laboratory staff and communicate improvements made as a result of input. Evaluate and implement suggestions to improve Student Roadshow for 2013. Implement a process for staff to perform home safety assessments with their families.

5.0 VPP Supplemental Information

5.1 Safety and Health Performance Data

Table 5.1 and Figure 5.2 provide safety performance data for the past 3 years. PNNL was once again among the top safety performers of Office of Science multi-program laboratories in 2012. As demonstrated in Figure 5.2, the 3-year rolling case rate average for Total Recordable (TR) and Day Away, Restricted and Transferred (DART) cases continue to demonstrate continuous improvement over the long term. The 3-year rolling TRC rate is 0.63; DART rate 0.24; a 15% and 20% reduction from 2011 3-year average rates, respectively. PNNL's TRC performance is the best among the Office of Science Multi-Program Laboratories as shown by Figure 5.1. This outstanding performance is particularly impressive given that PNNL does not use incentive programs to drive performance.

Table 5.1. Safety Performance Data for PNNL: Three-Year Occupational Injury and Illness Data

PNNL Employees (Only)					
Calendar Year	**Hours Worked**	**Total # Recordable Cases**	**Total Recordable Case Incidence Case Rate***	**# of Cases w/ Days Away or Restricted Time**	**Days Away & Restricted Time (DART) Case Rate***
2010	8,353,042	31	0.74	11	0.26
2011	8,450,106	26	0.62	13	0.31
2012	7,855,661	23	0.59	8	0.20
2010-2012	**24,658,809** *Total hours*	**80** *Total cases*	**0.65** *3-yr Average*	**32** *Total cases*	**0.26** *3-yr Average*
PNNL Construction Subcontractors (Only)					
2010	186,417	2	2.15	0	0.00
2011	35,321	0	0.00	0	0.00
2012	21,984	1	9.10	1	9.10
2010-2012	**243,722** *Total hours*	**3** *Total cases*	**2.46** *3-yr Average*	**1** *Total cases*	**0.82** *3-yr Average*
PNNL TOTAL (including subcontractors)					
2010	8,539,459	33	0.77	11	0.26
2011	8,485,427	26	0.61	13	0.31
2012	7,877,645	24	0.61	9	0.23
2010-2012	**24,902,531** *Total hours*	**83** *Total cases*	**0.67** *3-yr Average*	**33** *Total cases*	**0.27** *3-yr Average*
CY2011 BLS rates for NAICS 5417 ***"Scientific research and development services"***		*>1000*	***0.8***	*>1000 employees*	***0.4***
		All employers	***1.0***	*All employers*	***0.5***

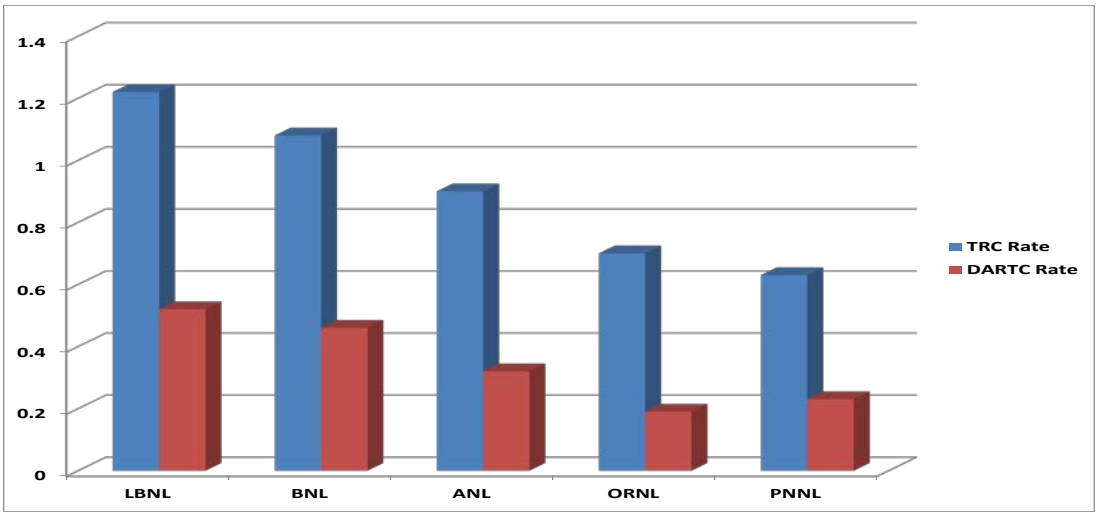

Figure 5.1. Safety Performance of Office of Science Multi-Program Laboratories (data based on CAIRS, Jan-Dec 2012)

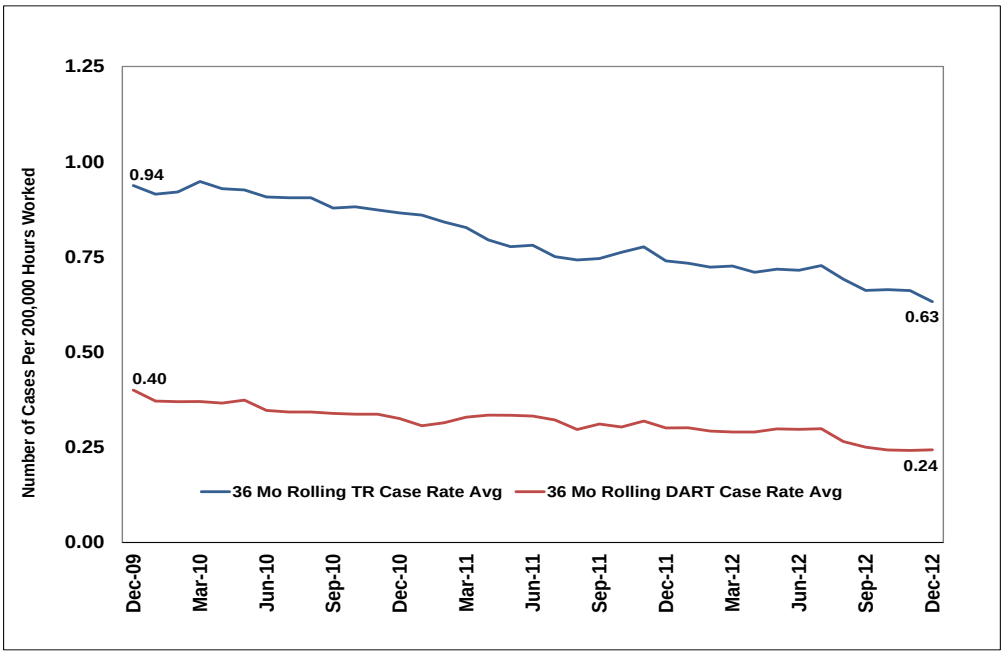

Figure 5.2. PNNL 3-Year Rolling Average TR and DART Case Rates (data based on SHIMS Dec 2009–Dec 2012)

Improvements in safety and health performance have made and sustained across the board in 2012 as demonstrated by the following examples:

- In 2012, WS&H electrical-related occurrences were down 77% from 2009.
- There has been a decrease in the number of ergonomic injuries. Over a 5-year period 2003–2007, PNNL averaged 16 repetitive motion incidents a year. Over the past 5 years, the average has dropped to under five per year (4.6), and in calendar year 2012, only one repetitive motion event was reported.

- The number of TR cases experienced in FY 2012 has dropped 29% and Overexertion or Strain Injuries resulting in Day Away Restricted or Transferred Cases have dropped 67% from FY 2009 numbers.

PNNL is proud of the outstanding progress in reducing the number and severity of injuries, but we also understand that lagging indicators of safety do not address the risk of serious operational failures. To minimize the potential for serious accidents, PNNL has developed a predictive indicator that identifies lesser engaged workgroups at risk for an operational event.

5.2 VPP Outreach Activities for Calendar Year 2012

PNNL VPP outreach activities culminated this year when it hosted a VPP evaluation team comprised of members from DOE and other VPP-certified sites. The visit and examination by the evaluation team resulted in PNNL once again achieving VPP Star Status. This is the highest VPP assessment ranking an organization can achieve and makes PNNL the only DOE Office of Science laboratory to have earned VPP Star Status.

The PNNL VPP website (http://vpp.pnl.gov) continues to be a source of significant outreach activity. In October 2012, the internal and external VPP websites were updated. The internal VPP website was combined with the Operational Excellence website to streamline internal messaging. Plans are in place to revise and update the external website.

In addition to staff outreach, PNNL VPP extends its reach to both professional safety communities as well as Tri-Cities neighbors and civic organizations. Table 5.2 provides a summary of additional external outreach activities during 2012.

Table 5.2. VPP Steering Committee Outreach Activities

Date	PNNL Steering Committee Member	Outreach Contact	Description of Outreach
February	Steve Goheen	Nevada National Security Site	Assisted with DOE VPP Triennial Re-evaluation Assessment. Brought back several ideas to improve programs (e.g., wellness).
March	Cindy Caldwell	Dr. John Winn, Dartmouth College	Dr. John Winn, Dartmouth College, spoke about the tragic death of a colleague working with dimethyl mercury and the importance of a questioning attitude.
	Cindy Caldwell	Mary Logue Jefferson Laboratory	Shared information on predictive modeling and Operational Culture Survey.
April	Nancy Isern	Gilbert Cosme and Dennis Dixon, Palo Verde Nuclear Generating Station	Exchanged information regarding how VPP communicates safety to PNNL staff, the role VPP has at PNNL, and key messages. They shared their presentation on the Seatbelt Convincer.

Table 5.2. (contd)

Date	PNNL Steering Committee Member	Outreach Contact	Description of Outreach
May	Nancy Isern, Cindy Caldwell	Grant Watson, NASA, Director of Safety and Mission Assurance	Exchanged safety culture/program information on program improvements and VPP.
	Fred Brockman, Jerry Dean, Joe Ortega, Jim Henle	Region X Meeting	Attended Region X VPP Conference. Several members attended Region X conference. Key messages were communicated to participants and information was shared (e.g., understanding consequences but choosing to accept the risk, back and shoulder injury preventions).
	Margie Myers (Lead), VPP Steering Committee	Multiple Contacts	The VPP booth at the Hanford Health and Safety Expo in May 2012 was a driving simulator used to demonstrate the dangers of texting while driving. A video also played to show the dangers of texting and driving.
August	Steve Goheen, Nancy Isern, Chandy Lindberg, Martin Iedema (SME), Loretta Shockey, Peggy Lang, Margie Myers	VPPPA National Meeting	Attended National Voluntary Protection Program Participants' Association (VPPPA) Conference. Presented Intern Roadshow and returned with many ideas for program improvements that are being addressed through subcommittees (e.g., staff recognition, communications, reporting).
November	Cindy Caldwell	Dr. Alice Young, Texas Tech University	Dr. Alice Young Texas Tech University shared lessons learned from an explosion that seriously injured a graduate student and steps that the university is taking to strengthen their safety culture.
All year	Nancy Isern, Jerry Dean, Renee McGaughy, Steve Goheen	Multiple contacts	Site Champions Monthly Meeting with Hanford Site Contractors.
	Various staff members	Participation in various Energy Facility Contractors' Group working groups	Input on standards development and continuous improvement actions related to EHS&S.

5.3 VPP Internal Communication Activities

In 2012, the VPP program expanded the scope of its communications efforts by integrating its safety message with PNNL's Operational Excellence initiative. Now, in addition to focusing staff attention on timely and relevant safety issues, VPP coordinates those messages in the context of continuously improving the Laboratory's operational performance.

Day to day, VPP outreach occurs face-to-face in the workplace, through an online presence on the Operational Excellence website, and through an ongoing Operational Culture Survey to gauge how staff

perceives Laboratory performance related to safety, security, sustainability and wellness into mission execution. The integrated approach was launched with an Operational Excellence website that brings together the following:

- VPP website
- Archives of Safety and Operating Experience Lessons Learned
- An Operational Culture Evaluation established through a year-round employee survey
- Laboratory and Directorate Safety Operations Council summaries
- Topical and timely commentaries on safety and operations from PNNL managers and thought leaders.

Besides delivering safety information to employees, the Operational Excellence website also establishes two-way communication channels for employees to recognize day-to-day safety excellence in the workplace, as well as ask questions or draw attention to safety concerns. Integrating VPP communications within the Operational Excellence framework has further embedded safety as an expected core business practice of all staff.

In addition to its integrated communication program, VPP continues to expand its legacy communication and staff engagement activities. In 2012, those activities included the following:

- An annual staff appreciation picnic that bring employees together in an informal setting where they share food and are able to visit an array of exhibits that display information on safety trends, equipment, wellness and sustainability. The picnic is also precedent-setting having become the first Laboratory event to achieve 97 percent zero waste, a distinction it has continued for 2 years.
- VPP participated in the annual “Taste of Diversity Street Fair” for staff, which is a lunch event for all staff where the street is shut down and filled with a variety of ethnic finger foods and showcases the diverse interest and activities of staff. VPP steering committee members had a booth promoting parking lot and crosswalk safety and talked to staff about their perceptions and how they could get involved.
- A series of safety roadshows that introduce student interns to Laboratory best safety practices. In addition to conducting the roadshow events on site in June and July, PNNL VPP leaders were invited to present a summary of the roadshow program at the 2012 VPP National Conference.
- The *Porcelain Press* newsletter shares timely and pertinent safety information with PNNL staff every month. The newsletter, which is posted in all Laboratory restrooms as well as online, is noted in employee survey responses as the most recognized safety communication at PNNL. Topics covered in the newsletter over the past year are listed in Table 5.3.
- Recognition rewards with the VPP logo are purchased and distributed by VPP as an incentive for staff participation in the annual survey, wellness events, as well as for other safety activities. While increasing survey responses, the rewards remind staff of the value of VPP and Safety 24/7.

Table 5.3. List of Operational Excellence Topics Issued in Porcelain Press in 2012

Month	Topic
January–February	Slips, Trips, and Falls Security Resolutions Pollution Prevention Pays Less Strain, More Gain
March	Reporting Safety Events or Occurrence Smart Passwords Preventing Repetitive Motion Injuries Sharing the Road with Bikes
April	Getting to Know your DSOC Protecting Against Car Thieves New Onsite Medical Provider Chosen Sustainability Goals
May	Student Intern Roadshows Crosswalk Enforcement Disposing of Prescriptions Recycling Mixed Plastic
June	Buzz About Insect Stings Telework at PNNL Cyber security Getting to Know Subject Matter Experts
July	Facility Alarms Financial Security on the Road Walking to Wellness Ride Sharing
August	Occupational Health Clinic Opening Zero Waste Event Planning Hosting Visitors to the Lab Summer Wellness Challenge Winners
September	Readying for Lab Lockdown Email Phishing PNNL Fleet Wins Sustainability Award Pedestrian Safety
October	Operational Culture Survey Flu Shot Program VPP Review Assessment Workplace Violence Prevention
November	Safeguarding PNNL Network Information Reducing Commuter Miles Ergonomic Health Winter Closure Notification System
December	Winter Walking Hazards Reducing Christmas Gift Waste Winter Driving Tips Understanding Export Controls

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Appendix A

Alignment of ES&H Programs

Leadership: Operational Excellence Credo	Objectives	Program Crosswalk*				
		VPP		Integrated Safety Management System (ISMS)		ISO 14001 Section
		Tenets	Elements	Core Functions	Guiding Principles	
Human life and health have value above all else. My actions set examples that ensure operational excellence and positively impact the Laboratory's reputation. I must create an environment where open and honest inputs are encouraged and addressed fairly. Hold managers and individuals, including myself, accountable for our actions. Consistently communicate performance expectations and recognize a job well done. Visit the workplace frequently.	Leaders have a passion for safety.	1	1a		1, 3	N/A
	Visible leadership is demonstrated by getting out into the workplace, setting a good example, and being involved in what's going on.	1	1a	5	1, 3	4.4.1
	Managers encourage and appreciate reporting of issues, are respectful, and respond proportionately to mistakes.	1	1a, 1d	5	1	N/A
	Staff at all levels take strong personal ownership for self-reporting deficiencies and taking responsibility to follow up in their resolution. There is a high level of integrity and staff set high standards for themselves and others.	2, 3	2a, 3e		1, 2	4.4.2, 4.5.3
	Staff recognize and reward others for performance that exceeds standards and expectations.	2	2a		1,2	4.1
	Managers provide ongoing reviews of performance of assigned roles and responsibilities to reinforce expectations and ensure that they are being met.	1	1a, 1c, 1e, 1i		1, 2	4.4.1, 4.4.2

Risk Management: Operational Excellence Credo	Objectives	Program Crosswalk*				
		VPP		ISMS		ISO 14001 Section
		Tenets	Elements	Core Functions	Guiding Principles	
All incidents are preventable. Human error is inevitable; but I can reduce its likelihood and severity. I understand the scope of work, the associated risks and how to manage the risks. I must act to reduce the likelihood and severity of human error to prevent incidents. Ensure that work is planned and there are adequate resources to do work right. Anticipate and recognize change and reassess risks.	Management and staff sincerely believe incidents are preventable.	1, 2	1a, 2a			N/A
	Individuals are mindful of impacts associated with errors and failures of equipment or processes.	4	4b		3	4.4.2
	At all levels of the organization and stages of work planning, staff are mindful and evaluate risks.	1, 3	1b, 1f, 1g, 3a–3g	2	4	4.3.1, 4.4.2
	Risks are identified, workers and SMEs are involved, and controls are implemented to make certain work is performed safely and within expectations.	3, 4	3d, 4a	2, 4	7	4.3.1, 4.4.6
	Risks and associated controls are updated when change occurs.	3, 4	3a–3g, 4a–4h		3	4.4.5, 4.4.6
	Emphasis is placed on work controls to reduce or eliminate hazards at all levels of the organization.	4	4a–4h	3	5, 6	4.4.6
	Organizational processes are designed to provide layers of defenses recognizing that people are fallible.	3, 4, 5	3a–3g, 4a–4h, 5a, 5b	4	6, 7	N/A
	The Laboratory is committed to incorporating error prevention into work.	1, 5	1a, 5a, 5b		6	4.5.3

Continuous Improvement: Operational Excellence Credo	Objectives	Program Crosswalk*				
		VPP		ISMS		ISO 14001 Section
		Tenets	Elements	Core Functions	Guiding Principles	
To improve we must be innovative and learn from our experiences. I strive to continuously improve the way we work. Incorporate feedback and learning from others to improve. Encourage people to make suggestions, raise issues and actively participate in resolution.	The Laboratory encourages the development of innovative business processes, systems and capabilities that maximize operational performance, and ultimately the increase in value of the Laboratory's products and services.			1	4	N/A
	Performance indicators are tracked, trended, evaluated, and acted upon.	1, 3	1b, 3g	5	1	4.5.1, 4.5.3
	Line managers are directly involved in oversight and performance improvement.	1	1d	1, 5	1, 4	4.4.1
	Operating experience is highly valued, the capacity to learn from experience is highly developed, and organization members convene to swiftly uncover lessons and learn from mistakes.	1	1a, 1e	5	3, 5	4.5.3
	Individuals are well informed of lessons learned and are committed to not repeating the mistakes.	1	1f, 1j	1, 5	3	4.4.2
	Issues are resolved effectively and efficiently.	3	3e	5	1	4.5.3
	A variety of methods are available for personnel to raise issues without fear of retribution.	2, 3	2a, 3e	3	1, 5	N/A
	Performance improvement processes encourage workers to offer innovative ideas.	2	2a, 2b	1	1, 2	N/A

Engagement: Operational Excellence Credo	Objectives	Program Crosswalk*				
		VPP		ISMS		ISO 14001 Section
		Tenets	Elements	Core Functions	Guiding Principles	
I am responsible for my own well-being and for the well-being of all those around me.	Staff feel comfortable, confident, and compelled to stop an activity that they perceive could result in an undesirable event.	1, 3	1a, 3e 5a, 5b	3	1, 2, 3	4.4.2, 4.4.6
We all have the authority to stop work and are expected to use it when needed.	Staff look out for each other because of genuine concern and care for every individual.	2	2a			N/A
	Staff take personal responsibility for themselves and others to eliminate “at risk” behaviors.	2	2a 5a, 5b		3, 6	4.4.2
Actively care for the safety and welfare of myself and others.	Team members support each other through awareness of each other’s actions and constructive feedback.	2	2a		3	4.4.2
Maintain a questioning attitude.	Individuals question deviations and avoid complacency.	2	2a, 2b		1	4.4.2

Key to Program Crosswalk

VPP Tenets and Sub-elements:

1=Management Leadership

1a=Commitment, 1b=Organization, 1c=Responsibility, 1d=Accountability, 1e=Resources, 1f=Planning,1g=Contract Workers, 1h=Program Evaluation, 1i=Site Orientation, 1j=Employee Notification

2=Employee Involvement

2a=Degree and Manner of Involvement, 2b=Safety Committees

3=Worksite Analysis

3a=Pre-Use/Pre-Startup Analysis, 3b=Comprehensive Surveys, 3c=Self-Inspections, 3d=Routine Hazard Analysis, 3e=Employee Reporting of Hazards, 3f=Accident Investigations, 3g=Trend Analysis

4=Hazard Prevention & Control

4a=Professional Expertise, 4b=Safety & Health Rules, 4c=Personal Protective Equipment, 4d=Preventative Maintenance, 4e=Emergency Preparedness, 4f=Radiation Protection Program, 4g=Medical Programs, 4h=Occupational Safety & Health Programs

5=Safety & Health Training

5a=Employees, 5b=Supervisors/Managers

ISMS Core Functions

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

ISMS Guiding Principles

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

ISO 14001:2004 Sections

4.1 General requirements
4.2 Environmental policy
4.3.1 Environmental aspects; 4.3.2 Legal and other requirements; 4.3.3 Objectives, targets, and programs
4.4.1 Resources, roles, responsibility and authority; 4.4.2 Competence, training, and awareness; 4.4.3 Communication; 4.4.4 Documentation; 4.4.5 Control of documents; 4.4.6 Operational control; 4.4.7 Emergency preparedness and response
4.5.1 Monitoring and measurement; 4.5.2 Evaluation of compliance; 4.5.3 Nonconformity, corrective action, and preventive action; 4.5.4 Control of records; 4.5.5 Internal audit
4.6 Management review

Appendix B

PNNL Operational Excellence – Foundation

Appendix B

PNNL Operational Excellence – Foundation

B.1 Introduction

Reaching a higher performance begins with PNNL's Credo for Operational Excellence (Figure 2.1), which defines the desired culture as the basis for measurement and analysis. Governed by the PNNL Research Operations Committee (ROC), the Credo focuses on the following four themes: leadership, risk management, continuous improvement, and engagement. Performance indexes were developed for all four themes, and goals for each index were set to distinguish outstanding and world class performance for quantitative measures. Appendix A describes how the elements of VPP, ISM, and ISO programs align with the Credo.

B.2 Attributes of the Credo for Operational Excellence

B.2.1 I Believe

Human life and health have value above all else: The health and safety of people is a priority for PNNL staff. When conflicts arise in the workplace, safety is not compromised. No one is expected to take unnecessary risks to accomplish the Laboratory's mission.

All incidents are preventable: Incidents result in negative consequences and include but are not limited to injuries. Incidents can also come from mistakes associated with any aspect of our business processes, such as errors in preparing proposals, designing research, and performing work. Looking retrospectively and "peeling back the onion," every incident could have been prevented if we had anticipated the unexpected. Careful planning reduces the number of events and/or the severity. If we truly believe that all incidents can be prevented, then an injury or incident in a work outcome cannot be dismissed as the result of a careless worker. Our organizational culture is totally committed to learning from all of our experiences to reduce the frequency and impact of incidents.

Instilling a belief that incidents are preventable is not about numbers; it is allowing our genuine value for the lives of people to touch us. It requires a strong commitment and dedication from everyone. As leaders, we can influence transformation of the concept into a value through conversations with staff that stimulate personal reflection and inquiry.

Human error is inevitable; but I can reduce its likelihood and severity: Error is part of human behavior. Most errors are trivial, but some errors trigger negative consequences. We cannot reduce errors to zero, but we can reduce their frequency and severity by looking beyond the person for weaknesses in organizational culture and processes.

To improve we must be innovative and learn from our experiences: The ability and willingness to learn is a critical aspect of improvement. Learning is gained through experimentation, observation, analysis, and a willingness to examine both successes and failures.

I am responsible for my own well being and for the well being of all those around me: All staff members feel responsible for the well-being of their coworkers as well as themselves and will intervene to prevent or mitigate an "error-likely" situation.

B.2.2 I Know

My actions set examples that ensure operational excellence and positively impact the Laboratory's reputation: Setting an example takes confidence and strength of character. Positive examples create opportunities for others to emulate and build personal reputation. Most importantly, the sum of our individual reputations contributes to form the Laboratory's reputation. Leaders do not necessarily need to be in positions of authority to make a profound difference and can come from anywhere in the organization. Leaders create change, set direction, and motivate people to see new possibilities.

I must create an environment where open and honest inputs are encouraged and addressed fairly: We want to create an open, collaborative environment where staff report what occurs so that we can collectively learn.

I understand the scope of work, the associated risks, and how to manage the risks: All business operation functions (such as finance, purchasing, ES&H, security, quality) are effectively integrated into work planning and execution, and staff are actively involved in the process.

I must act to reduce the likelihood and severity of human error to prevent incidents: Error prevention expectations are consistently communicated and applied throughout the Laboratory.

I strive to continuously improve the way we work: Learning is used to improve our business operations processes, systems, and capabilities to increase the value of the Laboratory's products and services.

We all have the authority to stop work and are expected to use it when needed: We will stop work if there is a concern that will affect the health and well-being of staff or the Laboratory's reputation, such as the scientific integrity of our work.

B.2.3 I Do

Hold managers and individuals, including myself, accountable for our actions: We hold each other accountable for our actions. All staff are expected to follow and reinforce established rules, procedures, policies, and behaviors.

Consistently communicate performance expectations and recognize a job well done: Shaping staff behavior will drive opinions and beliefs. High standards of work performance must be reinforced in all areas to achieve operational excellence. Recognition is an expression of a job well done and provides an opportunity to motivate staff and positively reinforce behavior.

Visit the workplace frequently: The presence of leadership in the workplace creates an understanding of worker challenges and concerns and provides an opportunity to reinforce expectations for operational performance with staff through coaching.

Ensure that work is planned and there are adequate resources to do work right: Sufficient resources have been provided so staff can do their work with distinction—effectively, efficiently, and in full compliance with regulatory and customer expectations. Resources may include manpower, financial support, and accessibility to information and equipment.

Anticipate and recognize change and reassess risks: To reduce the risk of human error, staff evaluate the implications of changes in the workplace to avoid unwanted outcomes and plan contingencies. Examples include new staff assigned to an activity, a move to a different workspace or laboratory, use of new equipment, and changes to an experimental process.

Incorporate feedback and learning from others to improve: A culture of problem prevention exists. Individuals share examples of problems they prevented. Staff are encouraged to identify opportunities for improvement by discussing good catches and near-misses. When things do not go right, we consistently take the opportunity to maximize learning.

Encourage people to make suggestions, raise issues, and actively participate in resolution: People are encouraged to speak openly and honestly, voicing what may not be popular. Staff are persistent and remind managers if problems are not resolved quickly. Managers respond promptly to issues and provide feedback on problem resolution. Individuals are engaged in designing and implementing improvement initiatives and solving problems.

Actively care for the safety and welfare of myself and others: The organization has created an environment in which everyone is encouraged to contribute to improvement and take whatever action is necessary to avoid injury to self or others. Staff are expected to make recommendations, even if the situation does not relate to their job.

Maintain a questioning attitude: To reduce the risk of human error, avoid complacency and question unexpected conditions. Consider and question decisions that are made and the steps put in place to implement them. Check the understanding of a situation by collaborating with others before proceeding. Ask: what is the worst thing that can happen in this situation?

B.3 Operational Excellence Themes

As noted above, the attributes of the Credo for Operational Excellence focus on the following four themes: leadership, risk management, continuous improvement, and engagement. Tables B.1 through B.4 provide the specific attributes, objectives, and indicators associated with each of the four operational excellence themes. Unless noted otherwise, the indicators are survey response data used in conjunction with other evaluation data as described in Section 2.0.

Table B.1. Leadership

Leadership: Operational Excellence Credo	Objectives	Indicators
Human life and health have value above all else. My actions set examples that ensure operational excellence and positively impact the Laboratory's reputation. I must create an environment where open and honest inputs are encouraged and addressed fairly. I hold managers and individuals, including myself, accountable for our actions. I consistently communicate performance expectations and recognize a job well done. I visit the workplace frequently.	Leaders have a passion for safety. Visible leadership is demonstrated by getting out into the workplace, setting a good example, and being involved in what is going on. Managers encourage and appreciate reporting of issues, are respectful, and respond proportionately to mistakes. Staff at all levels take strong personal ownership for self-reporting deficiencies and take responsibility to follow up in their resolution. There is a high level of integrity and staff set high standards for themselves and others. Staff recognize and reward others for performance that exceeds standards and expectations. Managers provide ongoing reviews of performance of assigned roles and responsibilities to reinforce expectations and make sure these expectations are being met.	My supervisor's first priority is accomplishing work safely. My supervisor understands how my work is performed. My supervisor makes sure my work is performed as planned. My concerns are respected and addressed. I am encouraged to report concerns even when no harm is done. My supervisor visits with me in my workplace. Safe work procedures are fairly and consistently enforced.

Table B.2. Risk Management

Risk Management: Operational Excellence Credo	Objectives	Indicators
All incidents are preventable. Human error is inevitable, but I can reduce its likelihood and severity. I understand the scope of work, the associated risks, and how to manage the risks. I must act to reduce the likelihood and severity of human error to prevent incidents. I need to ensure that work is planned and there are adequate resources to do the work right. I need to anticipate and recognize change and reassess risks.	Management and staff sincerely believe incidents are preventable. Individuals are mindful of impacts associated with errors and failures of equipment or processes. At all levels of the organization and stages of work planning, staff are mindful and evaluate risks. Risks are identified, workers and subject matter experts (SMEs) are involved, and controls are implemented to make certain work is performed safely within expectations. Risks and associated controls are updated when change occurs. Emphasis is placed on work controls to reduce or eliminate hazards at all levels of the organization. Organizational processes are designed to provide layers of defenses, recognizing that people are fallible. The Laboratory is committed to incorporating error prevention into work.	Integrated Operations System (IOPS) Permits updated* IOPS Reading Completion* IOPS Must Do Completion* IOPSHazard Awareness Summaries without Problem* Past due training* Research and project management risks are adequately identified and controlled (Project Review risk questions)* My work environment is maintained for safe operation. I have adequate training to recognize and respond to potential safety issues. Program risk and performance profile.*

* Performance metric from integrated management system

Table B.3. Continuous Improvement

Continuous Improvement: Operational Excellence Credo	Objectives	Indicators
To improve, we must be innovative and learn from our experiences. I strive to continuously improve the way we work. I incorporate feedback and learning from others to improve. I encourage people to make suggestions, raise issues, and actively participate in resolution activities.	The Laboratory encourages the development of innovative business processes, systems, and capabilities that maximize operational performance and ultimately increase the value of the Laboratory's products and services. Performance indicators are tracked, trended, evaluated, and acted upon. Line managers are directly involved in oversight and performance improvement. Operating experience is highly valued, the capacity to learn from experience is highly developed, and organization members convene to swiftly uncover lessons and learn from mistakes. Individuals are well informed of lessons learned and are committed to not repeating mistakes. Issues are resolved effectively and efficiently. A variety of methods are available for personnel to raise issues without fear of retribution. Performance improvement processes encourage workers to offer innovative ideas.	Lessons learned origin of demand (want to do vs. must do).* Percent unique Lessons Learned readership.* I believe efforts to improve health and safety are encouraged and recognized. My company adapts quickly and learns from errors. Issue closure timeliness.*

* Performance metric from integrated management system

Table B.4. Engagement

Engagement: Operational Excellence Credo	Objectives	Indicators
I am responsible for my own well-being and for the well-being of those around me. We all have the authority to stop work and are expected to use it when needed. I actively care for the safety and welfare of myself and others. I maintain a questioning attitude.	Staff feel comfortable, confident, and compelled to stop an activity they perceive could result in an undesirable event. Staff look out for each other because of genuine concern and care for every individual. Staff take personal responsibility for themselves and others to eliminate "at risk" behaviors. Team members support each other through awareness of each other's actions and constructive feedback. Individuals question deviations and avoid complacency.	I perform research and development (R&D) or manage projects of high quality with the most efficient use of resources. My workgroup questions things that could go wrong. Voluntary Retention Rate.* My first priority is accomplishing work safely.

* Performance metric from integrated management system

Appendix C

PNNL Operational Excellence Themes – Data

C.1 Performance Indexes

LEADERSHIP Theme Indicators	Actual Data	"Green" Benchmark	Index*	Weight	Weighted Value	"Gold" Benchmark	"Gold" Index Relative to "Green"
My supervisor's first priority is accomplishing work safely (VPP-7; % Strongly Agree/Agree)	89%	89%	1.00	14%	0.14	94%	1.1
My supervisor understands how my work is performed (VPP-15; % Strongly Agree)	40%	44%	0.90	14%	0.13	61%	1.4
My supervisor makes sure that my work is performed as planned (VPP-16; % Strongly Agree)	30%	44%	0.67	14%	0.09	61%	1.4
My concerns are respected and addressed (VPP-4; % Strongly Agree)	38%	33%	1.15	14%	0.16	50%	1.5
I am encouraged to report concerns even when no harm is done (VPP-3; % Strongly Agree)	43%	57%	0.75	14%	0.10	75%	1.3
Safe work procedures are fairly and consistently enforced (VPP-9; % Strongly Agree)	31%	57%	0.55	15%	0.08	75%	1.3
My supervisor visits with me in my workplace (VPP-2; % Strongly Agree)	36%	38%	0.96	15%	0.14	54%	1.4
Overall LEADERSHIP Index				**100%**	**0.85**		**1.3**

*Index=Actual/Target, if >target is good, or inverse if <target is good

RISK MITIGATION Theme Indicators	Actual Data	"Green" Benchmark	Index*	Weight	Weighted Value	"Gold" Benchmark	"Gold" Index Relative to "Green"
My work environment is maintained for safe operation (VPP-10; % Strongly Agree)	45%	44%	1.01	20%	0.20	65%	1.5
I have adequate training to recognize and respond to potential safety issues (VPP-11; % Strongly Agree)	45%	47%	0.96	10%	0.10	63%	1.3
Research and project management risks are adequately identified and controlled (Project Review risk questions FY 2012)	99%	95%	1.04	20%	0.21	100%	1.1
Program Risk and performance profile (% of EHS&S programs in green/blue – March 7, 2013)	85%	90%	0.94	20%	0.19	95%	1.1
Training not past due (FY 2012 total avg)	93%	97%	0.96	10%	0.10	100%	1.0
IOPS Permits (2-Year Update; FY 2012)	94%	95%	0.99	5%	0.05	100%	1.1
IOPS Reading Completion on time (FY 2012)	100%	95%	1.05	5%	0.05	99%	1.0
IOPS Must Do (FY 2012)	95%	95%	1.00	5%	0.05	100%	1.1
Percent of Hazards Awareness Summaries without Problem (FY 2012)	95%	95%	1.00	5%	0.05	100%	1.1
Overall RISK MITIGATION Index				**100%**	**0.99**		**1.2**

CONTINUOUS IMPROVEMENT Theme Indicators	Actual Data	"Green" Benchmark	Index*	Weight	Weighted Value	"Gold" Benchmark	"Gold" Index Relative to "Green"
I believe efforts to improve Health and Safety are encouraged and recognized (VPP-1; % Strongly Agree)	51%	43%	1.19	25%	0.30	60%	1.4
My company adapts quickly and learns from errors (VPP-8; % Strongly Agree)	24%	50%	0.47	25%	0.12	60%	1.2
% Unique Lessons Learned readership in the Laboratory (FY 2012)	90%	85%	1.06	13%	0.13	95%	1.1
Lessons Learned origin of demand: Want to vs. must do (FY 2012)	85%	75%	1.13	13%	0.14	85%	1.1
Issue closure timeliness (less than 9 mos; avg FY 2012)	92%	85%	1.08	25%	0.27	95%	1.1
Overall CONTINUOUS IMPROVEMENT Index				**100%**	**0.96**		**1.2**

ENGAGEMENT Theme Indicators	Actual Data	"Green" Benchmark	Index*	Weight	Weighted Value	"Gold" Benchmark	"Gold" Index Relative to "Green"
I perform R&D (or manage projects) of high quality with the most efficient use of resources (R&D Staff Sentiment top box)	26%	43%	0.60	25%	0.15	60%	1.4
Voluntary Retention Rate (FY 2012)	91%	95%	0.96	25%	0.24	98%	1.0
My first priority is accomplishing work safety (VPP-13; % Strongly Agree/Agree)	95%	96%	0.98	25%	0.25	98%	1.0
My workgroup questions things that could go wrong (VPP-14)	29%	47%	0.62	25%	0.15	63%	1.3
Overall ENGAGEMENT Index				**100%**	**0.79**		**1.2**

C.2 2012 VPP Questions and Responses

VPP1: I believe efforts to improve health and safety are encouraged and recognized.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	51.3	44.3	2.5	1.4	0.5	4.44	2264

VPP2: My supervisor visits with me in my workplace.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	36.3	47.0	6.2	7.7	2.8	4.06	2264

VPP3: I am encouraged to report concerns even when no harm is done.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	42.7	48.1	6.8	1.9	0.5	4.31	2236

VPP4: My concerns are respected and addressed.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	37.9	47.6	10.5	2.8	1.3	4.18	2140

VPP5: In your opinion, how valuable are each of the following PNNL Voluntary Protection Program (VPP) activities . (Mean Score)

Organization	Well4Life	Porcelain Press	VPP Picnic	DSOC	Safety Expo	Intern Roadshow	N
Laboratory level (%)	4.03	3.94	3.71	3.68	3.62	3.63	N/A

VPP6: Which activities have been conducted in your work area in the past year?

Organization	Ergonomic Assessment	Emergency Preparedness Drills	IOPS Self-Assessment (i.e., lab inspection)	Management Walk-thru (i.e., office inspection)	None of these	N
Laboratory level (%)	18	65	32	49	15	2264

VPP7: The following support my ability to work safely. (Check all that apply)

Organization	Ergonomic Equipment/ Tools	IOPS	Lock & Tag	PPE	Training	None of these	N
Laboratory level (%)	58.5	44.7	25.4	39.7	83.0	5.5	2264

VPP8: My Company adapts quickly and learns from errors.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	23.6	54.1	15.7	5.6	1.0	3.94	2264

VPP9: Safe work procedures are fairly and consistently enforced.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	31.2	56.2	8.8	2.8	1.0	4.14	2264

VPP10: My work environment is maintained for safe operation.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	44.6	51.7	2.9	0.8	0.1	4.40	2264

VPP11: I have adequate training to recognize and respond to potential safety hazards.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	45.1	52.3	1.9	0.7	0.1	4.42	2264

VPP12: I am confident that coworkers in my work area know what actions to take in an emergency.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	34.5	57.2	6.7	1.5	0.2	4.24	2264

VPP13: My first priority is accomplishing work safely.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	48.7	45.8	3.5	1.7	0.2	4.41	2264

VPP14: My workgroup questions things that could go wrong.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	29.1	51.8	15.1	3.4	0.6	4.05	2264

VPP15: My supervisor understands how my work is performed.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	39.7	49.4	6.2	3.3	1.4	4.23	2264

VPP16: My supervisor makes sure my work is performed as planned.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	29.6	50.8	13.2	5.4	1.1	4.02	2264

VPP17: My supervisor's first priority is accomplishing our work safely.

Organization	1	2	3	4	5	Mean	N
Laboratory level (%)	43.5	45.9	8.7	1.3	0.5	4.31	2264

C.3 Basis for Benchmark

C.3.1 Gallup® Professional, Scientific, and Technical Database Benchmarks

	Workgroup Level Industry Professional, Scientific, and Technical Services Scorecard %5s	
Percentile	75th	90th
Overall Satisfaction	29%	44%
Gallup® Q12		
Q12. Learn & grow	50%	67%
Q11. Progress	57%	73%
Q10. Best friend	40%	56%
Q09. Employees committed to quality	47%	63%
Q08. Mission/Purpose	43%	63%
Q07. Opinions count	33%	50%
Q06. Development	43%	60%
Q05. Cares about me	57%	75%
Q04. Recognition	40%	57%
Q03. Opportunity to do best	38%	54%
Q02. Have materials & equipment	43%	60%
Q01. Know what's expected	63%	80%

C.3.2 Safety Benchmarks

Managing for World Class Safety (Stewart 2001) describes benchmark research performed from 1995 to 1998 through the Rotman School of Management at the University of Toronto. A comprehensive safety questionnaire was used to investigate five North American companies that have achieved enduring world class safety performance to determine quantitatively how they achieved excellence. Similar measurements were taken at companies with poor safety ratings to validate measurement techniques. The LWIF of the five very safe companies averaged 0.08 per 200,000 hours worked over a 5-year period (the five companies chosen had average LWIFs from 0.03 to 0.12). The lost workday frequency for the poor safety rating companies averaged 20 per 200,000 hours worked. World class safety was defined as having a

5-year average LWIF no worse than 0.25 per 200,000 hours, with no single year worse than 0.50. The criterion for qualification as a poorly performing company was set at a LWIF greater than seven for an average of at least 3 years.

Q-1 The priority individuals give to safety	% who ranked safety first
Best result	94
Safe company average	83
Unsafe company average	62
Worst result	56
Q-2 Worker's view of the priority managers give to safety	**% who ranked safety first**
Best result	87
Safe company average	66*
Unsafe company average	19
Worst result	8
*81 without outlier	
Q-8 Extent that line managers are held accountable for safety	**% who said line management is held fully accountable**
Best result	61
Safe company average	44
Unsafe company average	10
Worst result	2
Q-20 Safety of physical facilities in your workplace	**% who said facilities are excellent**
Best result	65
Safe company average	44
Unsafe company average	5
Worst result	0

C.3.3 Correlation to Q12 Benchmarks

C.3.3.1 8 vs. 13 Highest Correlations

PNNL Specific Question (C01-C08)	Gallup® Question (Q00-Q12)	Pearson's r
C01. I received feedback on the previous employee engagement survey conducted at my organization.	Q11. In the last six months, someone at work has talked to me about my progress.	0.616
C02. My team participated in an effective action planning session after last year's employee engagement survey.	Q06. There is someone at work who encourages my development.	0.594
C03. My team has made progress on the goals set during our action planning sessions after the last employee engagement survey.	Q06. There is someone at work who encourages my development.	0.609
C04. My current job brings out my most creative ideas.	Q03. At work, I have the opportunity to do what I do best every day.	0.742
C05. My organization encourages new ideas that defy conventional wisdom.	Q07. At work, my opinions seem to count.	0.787
C06. My organization values diverse opinions and ideas.	Q07. At work, my opinions seem to count.	0.834
C07. My supervisor creates an environment that is trusting and open.	Q05. My supervisor, or someone at work, seems to care about me as a person.	0.705
C08. I would recommend my organization as a great place to work.	Q00. How satisfied are you with your organization as a place to work?	0.869

Note: The Pearson's r value is used to measure the strength of the relationship between two variables. Results range from a value of -1 to 1 with 1 being a direct relation, 0 being neutral, and -1 being a direct inverse relation.

Interpretation:

C01-C03: Groups which discussed last year's Gallup® results spend more quality time with their manager/mentor.

C04: Groups who feel creative on the job also feel like they get to do what they do best every day.

C05-C06: Groups who think their ideas are valued and encouraged feel their opinions count.

C07: Groups who think their manager creates a trusting, open environment feel cared about.

C08: Groups who would recommend PNNL as a great place to work are more satisfied with their job.

C.3.3.2 20 vs. 13 Highest Correlations

VPP Question (C01-C20)	Gallup® Question (Q00-Q12)	Pearson's r
C01. To what extent can injuries be prevented?	Q08. The mission or purpose of my organization makes me feel my job is important.	0.224
C02. I believe efforts to improve safety and health are encouraged, recognized, and responded to at PNNL.	Q02. I have the materials and equipment I need to do my work right.	0.372
C03. Management visits my workplace on a routine basis.	Q03. At work, I have the opportunity to do what I do best every day.	0.336
C04. I feel free to approach management regarding any safety concern.	Q02. I have the materials and equipment I need to do my work right.	0.408
C05. I am regularly involved in decisions that affect my safety and health.	Q09. My associates or fellow employees are committed to doing quality work.	0.319
C06. I am aware of PNNL Safety Committee activities (e.g., VPP, DZAC, Electrical, Lock & Tag, Biological).	Q03. At work, I have the opportunity to do what I do best every day.	0.428
C07. I am knowledgeable regarding the safety and health requirements that apply to my work.	Q10. I have a best friend at work.	0.382
C08. Workspace or activity safety inspections are conducted in my work area.	Q12. This last year, I have had opportunities at work to learn and grow.	0.254
C09. Responses to reports of hazards are timely and adequate.	Q02. I have the materials and equipment I need to do my work right.	0.464
C10. I have been involved with hazard analysis (e.g., IOPS Permits, Procedures, Ergonomic Evaluations, Pre-Job Reviews, and Electronic Prep and Risk (EPR).	Q12. This last year, I have had opportunities at work to learn and grow.	0.31
C11. Engineering controls, work practices, or personal protective equipment support my ability to work safely.	Q02. I have the materials and equipment I need to do my work right.	0.338
C12. I have seen safe work procedures fairly and consistently enforced.	Q02. I have the materials and equipment I need to do my work right.	0.561
C13. Equipment in my work area is properly/adequately maintained for safe operation.	Q12. This last year, I have had opportunities at work to learn and grow.	0.482
C14. I have been trained to recognize and respond to potential hazards to protect myself and others.	Q09. My associates or fellow employees are committed to doing quality work.	0.281
C15. The safety and health training I receive is appropriate for my job.	Q03. At work, I have the opportunity to do what I do best every day.	0.511
C16. I am confident that my coworkers know what actions to take and where to go in an emergency at my work location.	Q03. At work, I have the opportunity to do what I do best every day.	0.288
C17. Safety is a core value for ME.	Q10. I have a best friend at work.	0.271
C18. I believe safety is a core value for MY COWORKERS.	Q09. My associates or fellow employees are committed to doing quality work.	0.328
C19. I believe safety is a core value for MY IMMEDIATE MANAGER.	Q09. My associates or fellow employees are committed to doing quality work.	0.342

VPP Question (C01-C20)	Gallup® Question (Q00-Q12)	Pearson's r
C20. I believe safety is a core value for MY PROJECT MANAGER (if applicable).	Q12. This last year, I have had opportunities at work to learn and grow.	0.376

Interpretation:

Of the 13 Gallup® Questions, 4 Questions account for 17 of these 20 correlations (each is the highest correlation for either 4 or 5 VPP Questions). These are:

Q02. I have the materials and equipment I need to do my work right. – More likely to believe safety is encouraged and recognized, feel free to approach management regarding safety, believe responses to hazards are timely and adequate, believe controls, practices and equipment support their safety, and see safety enforced. The theme of these questions is I HAVE WHAT I NEED AND GET WHAT I ASK FOR.

Q03. At work, I have the opportunity to do what I do best every day. – More likely to have management visit, be aware of PNNL Safety Committee activities, have appropriate safety training, and be confident in coworkers knowledge of safety. The theme of these questions is I COMMUNICATE WITH OTHERS REGARDING SAFETY.

Q09. My associates or fellow employees are committed to doing quality work. – More likely to be involved in safety decisions, have been trained in safety, and have coworkers and immediate managers with safety as a core value. The theme of these questions is I BELIEVE SAFETY IS IMPORTANT TO MY WORK GROUP.

Q12. This last year, I have had opportunities at work to learn and grow. – More likely to have safety inspections, be involved in hazard analysis, have properly maintained equipment, and have safety be a core value for their projects. This theme might be I BELIEVE SAFETY IS IMPORTANT TO MY PROJECTS.

Q10. "Best Friend at Work" was highest for two VPP questions – "C17. Safety is a core value for ME" and "I am knowledgeable regarding the safety and health requirements that apply to my work." The logic here might be PEOPLE WITH FRIENDS AT WORK VALUE SAFETY MORE BECAUSE THEY LOOK OUT FOR THEIR FRIENDS. This also appears to give show that the "best friend" question is more valuable than some people give it credit. It might be difficult to understand, but this shows it can be a strong predictor nonetheless.

Q08. "The mission or purpose of my organization makes me feel my job is important" had the strongest correlation for "C01. To what extent can injuries be prevented?" PEOPLE WHO FEEL THEIR JOB IS IMPORTANT ARE MORE LIKELY TO THINK ACCIDENTS CAN BE PREVENTED.

2013 Operational Excellence Culture Evaluation

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