

2010

Baldrige National Quality Program



NuGrain Laboratories Feedback Report



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The *NuGrain Laboratories Feedback Report* was prepared for use in the 2010 Malcolm Baldrige National Quality Award Examiner Preparation Course. The report reflects the work of a team of experienced Baldrige Examiners who evaluated the *NuGrain Laboratories Case Study* using the Independent and Consensus Review process. The *NuGrain Laboratories Case Study* describes a fictitious government-owned, contractor-operated research laboratory. There is no connection between the fictitious NuGrain Laboratories and any other organization, either named NuGrain Laboratories or otherwise. Other organizations cited in the case study also are fictitious, except for several national and government organizations. Because the primary purpose of the case study is to provide learning opportunities for training Baldrige Examiners and others, there are areas in the case study where Criteria requirements purposely are not addressed.

NuGrain Laboratories scored in band 5 for both Process and Results Items. An organization in band 5 for Process Items typically demonstrates effective, systematic, well-deployed approaches responsive to the overall requirements of most Criteria Items. The organization demonstrates a fact-based, systematic evaluation and improvement process and organizational learning, including innovation, that result in improving the effectiveness and efficiency of key processes. For an organization that scores in band 5 for Results Items, results typically address most key customer/stakeholder, market, and process requirements, and they demonstrate areas of strength against relevant comparisons and/or benchmarks. Improvement trends and/or good performance are reported for most areas of importance to the Criteria requirements and the accomplishment of the organization's mission. Performance projections for some high-priority areas are reported.



Baldrige National Quality Program
National Institute of Standards and Technology • Department of Commerce

October 27, 2010

Ms. Celia Valasquez
Chief Operations Officer
NuGrain Laboratories for Strategic Agricultural Research
Kearney, NE 68848

Dear Ms. Valasquez:

Congratulations for taking the Baldrige challenge! We commend you for your commitment to performance excellence and applying for the Malcolm Baldrige National Quality Award. This feedback report was prepared for your organization by members of the Board of Examiners in response to your application for the 2010 Malcolm Baldrige National Quality Award. It presents an outline of the scoring for your organization and describes areas identified as strengths and opportunities for possible improvement. The report contains the Examiners' observations about your organization, although it is not intended to prescribe a specific course of action. Please refer to "Preparing to Read Your Feedback Report" for further details about how to use the information contained in your feedback report.

We are eager to ensure that the comments in the report are clear to you so that you can incorporate the feedback into your planning process to continue to improve your organization. As direct communication between Examiners and applicants is not permitted, please contact me at (301) 975-2360 if you wish to clarify the meaning of any comment in your report. We will contact the Examiners for clarification and convey their intentions to you.

The feedback report is not your only source for ideas about organizational improvement. Current and previous Award recipients can be potential resources on your continuing journey to performance excellence. A contact list of Award recipients is enclosed. The 2010 recipients will share their stories at our annual Quest for Excellence Conference, April 3–6, 2011. Current and previous recipients participate in our regional conferences as well. Information about these events and other Baldrige Program-related activities can be found on our Web site at www.nist.gov/baldrige.

In approximately 30 days, you will receive a customer satisfaction survey from the Panel of Judges. As an applicant, you are uniquely qualified to provide an effective evaluation of the materials and processes that we use in administering the Award Program. Please help us continue to improve the program by completing and returning this survey.

Thank you for your participation in the Baldrige Award process. Best wishes for continued success with your performance excellence journey.

Sincerely,

Harry S. Hertz, Director
Baldrige National Quality Program

Enclosures

The economic environment is difficult for Cargill Corn Milling, as it is difficult for many manufacturing companies today. But ... by utilizing the processes and tools that we've learned from Baldrige, we're able to not only meet these challenges but actually excel in them.

*Alan Willets, President and Business Unit Leader
Cargill Corn Milling
2008 Baldrige Award Recipient*

Preparing to read your feedback report . . .

Your feedback report contains Baldrige Examiners' observations based on their understanding of your organization. The Examiner team has provided comments on your organization's strengths and opportunities for improvement relative to the Baldrige Criteria. The feedback is not intended to be comprehensive or prescriptive. It will tell you where Examiners think you have important strengths to celebrate and where they think key improvement opportunities exist. The feedback will not necessarily cover every requirement of the Criteria, nor will it say specifically how you should address these opportunities. You will decide what is most important to your organization and how best to address the opportunities.

If your organization last applied before 2008, you may notice a slight change in the report. Key themes, which serve as an overview or executive summary of the report, comprise four sections rather than three: (a) Process Item strengths, (b) Process Item opportunities for improvement, (c) Results Item strengths, and (d) Results Item opportunities for improvement. In addition, each 2010 feedback report includes a graph in Appendix A that shows your organization's scoring profile compared to the median scores for all 2010 applicants.

Applicant organizations understand and respond to feedback comments in different ways. To make the feedback most useful to you, we've gathered the following tips and practices from prior applicants for you to consider.

- Take a deep breath and approach your Baldrige feedback with an open mind. You applied to get the feedback. Read it, take time to digest it, and read it again.
- Especially note comments in **boldface type**. These comments indicate observations that the Examiner team found particularly important—strengths or opportunities for improvement that the team felt had substantial impact on your organization's performance practices, capabilities, or results and, therefore, had more influence on the team's scoring of that particular Item.
- You know your organization better than the Examiners know it. If the Examiners have misread your application or misunderstood information contained in the application, don't discount the whole feedback report. Consider the other comments, and focus on the most important ones.

- Celebrate your strengths and build on them to achieve world-class performance and a competitive advantage. You've worked hard and should congratulate yourselves.
- Use your strength comments as a foundation to improve the things you do well. Sharing those things you do well with the rest of your organization can speed organizational learning.
- Prioritize your opportunities for improvement. You can't do everything at once. Think about what's most important for your organization at this time, and decide which things to work on first.
- Use the feedback as input to your strategic planning process. Focus on the strengths and opportunities for improvement that have an impact on your strategic goals and objectives.

The real value in applying for this Award is in the rigorous evaluation process. The constructive feedback from Baldrige helps us improve the way we do business.

*Mike Levinson, City Manager
City of Coral Springs
2007 Baldrige Award Recipient*

The Baldrige Award application process has provided our company with many learning and continuous improvement opportunities, making Pro-Tec better for the endeavor.

*W. Paul Worstell, President
Pro-Tec Coating Company
2007 Baldrige Award Recipient*

KEY THEMES

Key Themes—Process Items

NuGrain Laboratories for Strategic Agricultural Research (NuGrain) scored in band 5 for Process Items (1.1–6.2) in the Consensus Review of written applications for the Malcolm Baldrige National Quality Award. For an explanation of the process scoring bands, please refer to Figure 6a, Process Scoring Band Descriptors.

An organization in band 5 for Process Items typically demonstrates effective, systematic, well-deployed approaches responsive to the overall requirements of most Criteria Items. The organization demonstrates a fact-based, systematic evaluation and improvement process and organizational learning, including innovation, that result in improving the effectiveness and efficiency of key processes.

a. The most important strengths or outstanding practices (of potential value to other organizations) identified in NuGrain’s response to Process Items are as follows:

- NuGrain leverages its core competencies of systematic agricultural research, Process Portfolio Management, and Research Portfolio Management (Figure 6.1-1) to optimize the long-term life-cycle management of agricultural research contracts. Each strategic objective is aligned with a core competency. These core competencies are supported by an effective, systematic Work System Design Process (Figure 6.1-2) and Stage-Gate Process (Figure 6.2-1) that integrate voice-of-the-customer (VOC) needs and expectations into the design of the key processes and work systems. This integrated approach demonstrates the organizational value of a focus on efficient and effective processes.
- NuGrain demonstrates management by fact through systematic approaches for data measurement, analysis, and use; the Measure Selection Process; and a schedule of organizational performance reviews aligned with contract, strategic, and other business needs (Figure 4.1-3). An example of NuGrain’s ability to translate data into meaningful information is senior leaders’ (SLs’) use of the Senior Leadership Team (SLT) Scorecard to monitor progress on research projects and programs and achievement of the Strategic Plan. As part of strategy development, the Metrics Infrastructure Group (MIG) collects and aggregates data for the environmental scan. R-37 survey data are used both to identify potential products for customers and in the Requests for Proposals development process. These processes allow NuGrain to improve organizational performance, incorporate learning as cycles of refinement into current processes, and build on the success factor of strong business practices that provide systematic, repeatable results in business management.
- NuGrain focuses on customer-driven excellence through designing and improving systematic processes. For example, NuGrain uses a VOC approach to determine key customer requirements, ensures a focus on customer requirements with the Performance Evaluation Plan (PEP), develops staff capability to engage customers via Touch Point

training, obtains input from customers and partners to incorporate into the Strategic Planning Process (SPP), and uses the complaint process and the Irritant Program to address customer dissatisfaction. To incorporate organizational learning, these customer-focused processes have undergone cycles of refinement resulting in improved processes over time. All of these approaches support NuGrain's customer-focused culture and align with its principal success factor of excellent and sustainable relationships with customers, suppliers, partners, and collaborators.

- NuGrain utilizes a well-executed approach to organizational learning that includes continuous improvement of existing processes. For example, the Senior Leader Communication Plan was refined in 2008 to include daily rounding with employees, and it was recently refined to include the collection of topics and questions before Hoedown Sessions. The SPP is evaluated annually, and improvements include the revision of planning horizons, the introduction of the Strategic Alignment Document, and the formation of the MIG. Other approaches that have been refined include the Product and Service Offering Process (PSOP), the VOC Process, workforce engagement and communication processes, and approaches used to improve work processes. By assessing and refining approaches important to organizational success, NuGrain supports its cultural focus of identifying problems, innovating solutions, and improving performance results.

b. The most significant opportunities, concerns, or vulnerabilities identified in NuGrain's response to Process Items are as follows:

- Although NuGrain has multiple approaches to engage customer and stakeholder groups, there are gaps in deployment to some of these groups. For example, it is not evident that potential customers included in the Product and Service Offering Committee (PSOC) include representatives from diverse geographies and market segments. It is not evident that the Irritant Program is deployed to all relevant customer/partner groups, nor is it clear that Touch Point training is individualized to meet the varying requirements of customers and stakeholders. The PEP Negotiation Process does not appear to be deployed to all relevant customer groups, such as government agencies other than the U.S. Department of Agriculture (USDA) and the Work for Others (WFO) program managers. Finally, it is not clear how work process management approaches are deployed to partners and collaborators. Without full deployment, NuGrain may be limited in its ability to fully leverage its principal success factor of excellent and sustainable relationships with customers, suppliers, partners, and collaborators.
- While NuGrain tracks data and information on a variety of measures to use for organizational performance improvement, it is not clear that the organization utilizes systematic processes to determine organizational goals, performance projections, or comparative data. Goals are not included in the Strategic Alignment Document (Figure 2.2-1), and it is not evident how the projections included in this document and in results data were chosen. Additionally, it is not clear how the Comparative Data Selection Process ensures the effective use of comparative data or how the process supports top-box comparisons and innovation. Developing and implementing systematic processes for determining organizational goals, performance projections, and comparative data may

help NuGrain achieve exceptional performance, as well as attain its vision of becoming the premier government-owned laboratory.

- Several operational processes do not appear to be fully deployed to all relevant workforce segments and geographic sites. For example, while social responsibility is a priority and NuGrain supports voluntarism, it is not clear whether its workforce members in all types of jobs (e.g., scientists, farm operations staff) at all locations participate in its volunteer activities. While NuGrain identifies four methods used to improve work processes, it is not clear that these methods are deployed to all sites and workforce segments. Also, it is unclear whether NuGrain deploys succession planning and career progression processes to all workforce members, including scientists in highly technical, specialized areas, and whether the Engagement of Workforce Assessment (EWA) differs across workforce segments. Without fully deploying key operational processes to all relevant workforce segments and sites, NuGrain may miss opportunities to engage the entire workforce and demonstrate leadership in the communities it serves.

Key Themes—Results Items

NuGrain scored in band 5 for Results Items (7.1–7.6). For an explanation of the results scoring bands, please refer to Figure 6b, Results Scoring Band Descriptors.

For an organization in band 5 for Results Items, results typically address most key customer/stakeholder, market, and process requirements, and they demonstrate areas of strength against relevant comparisons and/or benchmarks. Improvement trends and/or good performance are reported for most areas of importance to the Criteria requirements and the accomplishment of the organization’s mission. Performance projections for some high-priority areas are reported.

c. Considering NuGrain’s key business/organization factors, the most significant strengths found in response to Results Items are as follows:

- Multiple process effectiveness outcomes that are aligned with NuGrain’s key customer requirements of reduced cycle times and effective program execution demonstrate good performance levels, beneficial trends, and favorable comparisons. Research Total Cycle Time (Figure 7.5-1) shows improvement in strategic thrust areas and overall, with overall performance improving from 39 months in 2003 to 30 months in 2009 and outperforming the best competitor since 2005. External Peer Review Scores (Figure 7.5-2) also show improvement overall and in strategic thrust areas from 2003 to 2009, with overall results equal to or better than the best competitor’s since 2006. During the same time period, the Process Management Efficiency Ratio (Figure 7.5-4) improved from about 100 to approximately 1,700, with performance equal to or better than the best competitor’s in the last two years. In addition, results for Idea Well suggestions and implementations (Figure 7.5-16) show that from 2005 to 2009, submissions increased from 586 to 1,129, and implementations grew from 92 to 564. These results indicate NuGrain’s success in building on its principal success factors of cycle time to bring research opportunities to commercialized use and strong business practices that provide systematic, repeatable results in business management, as well as its value of cultivating innovation and creativity.

- Several of NuGrain’s product and financial outcomes demonstrate beneficial trends and favorable comparisons. For example, the percentage of Incentive Award Fees Earned (Figure 7.1-2) almost doubled between 2003 and 2009 and exceeded the performance of the best USDA competitor each year. Similarly, the number of patents awarded for 2009 (Figure 7.1-3) was more than four times the 2003 level and 17 percent above the best competitor’s level. In 2009, NuGrain exceeded its best competitor in the number of articles published in peer-reviewed journals (Figure 7.1-4), with a total of 3,000 articles compared to 2,400 for the competitor. In addition, from 2003 to 2009, the value increase for Crop Yields (Figure 7.1-5) improved from \$10 to \$150 per acre, outperforming the best competitor each year. Also, results for Funding Growth (Figure 7.3-1) show steady improvement from \$20 million in 1997 to \$2.4 billion in 2009, surpassing NuGrain’s top two competitors. Results for Funding Sources by Customer Group (Figure 7.3-5) show an increase from 2003 to 2009 in funding from other government agencies from zero to over 20 percent, while WFO funding increased about 8 percent. These results indicate NuGrain’s success in addressing its strategic challenges of uncertain funding and competition with other contractors.
- Several customer-focused and workforce-focused results demonstrate good performance levels, beneficial trends, and/or favorable comparisons. Results for USDA Satisfaction with Research Program Elements and USDA Satisfaction with Research Project Elements (Figures 7.2-1 and 7.2-2) show significant improvement from 2005, when scores ranged from 75 to 80, to 2009, with scores that range from 86 to 95. Results from the EWA for Engagement Overall and by Segments, Engagement by Location and Years of Service, and Engagement by Education and Ethnicity (Figures 7.4-1 through 7.4-3) show improvement for all segments from 2005 to 2009, with NuGrain’s 2009 overall engagement score exceeding the best peer comparison. During the same time period, results for Engagement on Elements of Organizational Health (Figure 7.4-4) show improvement to a score at or above 4.0 (on a 5-point scale) for all seven elements, with six of those elements equaling or surpassing the best peer’s score. Also, NuGrain’s Training Effectiveness by Assessment Level (Figure 7.4-8B) has been better than the best competitor’s results since 2007 and steadily improved for each level from 2005 to 2009. These results support the principal success factor of attracting the brightest minds by addressing the opportunity to grow and learn as well as other workforce engagement and satisfaction factors.

d. Considering NuGrain’s key business/organization factors, the most significant opportunities, vulnerabilities, and/or gaps (related to data, comparisons, linkages) found in response to Results Items are as follows:

- NuGrain is missing results in several areas of its overall organizational performance. For example, results are not included for several strategic thrust areas, such as enhancing the taste of healthier products (Better Nutrition Approaches); new or more useful products from plants, including fiber-conversion products (New and Useful Product Development); or fertilization in different growing environments (Grain Safety and Resistance). In addition, NuGrain does not present results for its core competency of specialized research competencies, such as corn or wheat enhancements from gene

engineering or crop nanotechnology, or results related to the success factor of the ability to engage in high-risk research. Results are not provided for measures of engagement and loyalty for several key market segments, such as the agricultural and scientific communities. Likewise, NuGrain does not report results for many important measures of workforce engagement and satisfaction, such as scientific freedom, access to state-of-the-art technology, the opportunity to publish and present, tools to do the job, work experience while in school, job security, challenging and meaningful work, effective support processes, flexible hours, and adequate staffing. NuGrain may not be able to fully achieve its mission and vision without a full complement of organizational performance measures.

- Several results do not include competitive or comparative data. For example, comparisons are not provided for results related to the satisfaction of the scientific and agricultural communities, collaborating universities, or students (Figures 7.2-6 through 7.2-9). Also, no comparative data are included in several leadership outcomes, such as measures of fiscal accountability (Figure 7.6-2), regulatory and legal findings (Figure 7.6-3), and ethical behavior (Figure 7.6-4). In addition, some comparisons may not support NuGrain's vision to be the premier government-owned laboratory system. For example, comparisons for the number of articles published relative to USDA competitors (Figure 7.1-4) do not take into account the many laboratories outside the agricultural industry. Similarly, several financial results, such as Overall Performance to Budget (Figure 7.3-2) and Project Overhead Costs (Figure 7.3-6), are compared only to those of a very limited number of competitors. NuGrain may not be able to maintain its strategic advantage of strong results without robust and appropriate comparative data.

DETAILS OF STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT

Category 1 Leadership

1.1 Senior Leadership

Your score in this Criteria Item for the Consensus Review is in the 70–85 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- NuGrain’s Leadership Integration Model (Figure 1.1-1) provides a systems approach to leadership that includes multiple linked processes to guide and sustain the organization by setting direction and vision, planning, aligning the mission to customer and stakeholder requirements and organizational core competencies, deploying resources, developing the workforce, and performing other leadership functions. The model places NuGrain’s mission at the center of all leadership activities. SLs deploy the mission, vision, and values (MVV) by posting them in the cafeteria and other common areas, reinforcing them at new employee orientation and Hoedown Sessions, and creating 10-minute MVV/strategic objective teaching moments for monthly presentation by managers. NuGrain also includes the MVV and performance expectations in all partner and supplier contracts. The MVV are reviewed and kept current as part of the SPP.
- NuGrain’s organizational value of demonstrating integrity in its science, relationships, and management of government assets sets the foundation for SLs to foster, require, and ensure legal and ethical behavior. Annually, SLs sign the Code of Conduct during a quarterly workforce meeting and provide personal examples of ethical business conduct. SLs enforce a no-tolerance approach for violations of the Code of Conduct. As a result of a performance improvement review in 2006, SLs began conducting an annual, mandatory legal and ethical webcast for the workforce and partners. During this webcast, SLs review the annual USDA Ethics Report, identify new legal requirements, and role-play case studies.
- The Senior Leader Communication Plan is used to enhance and ensure communications with the workforce, customers, and stakeholder groups. The plan notes what each leadership group is to communicate as well as how often. Methods of communicating with the workforce (Figure 1.1-3) include such approaches as Hoedown Sessions, e-mail, an internal newspaper, and weekly face-to-face or webcam discussions with 10 randomly selected employees. The approach was refined in 2008, when SLs began daily rounding with employees, and more recently with the solicitation of topics and questions before Hoedown Sessions. Approaches used by SLs to reward and recognize members of the workforce include personal thank-you notes, awards for high performance, and staff performance incentives/bonuses. These multiple methods support NuGrain’s value to “practice open and honest communication with each other and our partners” and reinforce a culture of high performance.

- Innovation of processes is part of NuGrain’s organizational culture. SLs personally participate in the SPP, action planning, the Process Design Process (PDP), and the Stage-Gate Process with the intent of ensuring that innovation is a focus. Additionally, partner agreements contain measurable outcomes for implementing new approaches, and three workforce awards are given for innovation. Further, benchmarks are built into data analysis to challenge NuGrain’s workforce to use innovation to match and exceed competitors’ performance.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain routinely obtains input from customers and other stakeholders and uses this input during the SPP, it is not evident how the organization balances value for all customers and other stakeholders. For example, customer relationship development concentrates on the USDA, with little evidence of similar relationship development with the newer research funding customers. Additionally, organizational action planning does not appear to fully address university partnership opportunities outside Nebraska Free University (NFU). Without effectively balancing value for all customers and stakeholders, NuGrain may have difficulty maintaining its principal success factor of maintaining excellent and sustainable relationships with customers and partners, as well as addressing its sustainability strategic challenge of an uncertain funding environment.
- Although SLs identify one leadership skill they will work on together each year, NuGrain does not appear to have a fact-based, systematic approach in place for each SL to develop and enhance his or her personal leadership skills. Additionally, there is little evidence that NuGrain’s approach to the development of future leaders, including succession planning, is deployed to a variety of workforce segments, such as scientific researchers with specialized knowledge and expertise and employees who are primary contacts with key partners. A lack of deployment to such workforce members may limit NuGrain’s attempts to create a sustainable organization.

1.2 Governance and Societal Responsibilities

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- SLs are accountable to the NFU Board of Trustees (BOT) and Chancellor. NuGrain’s Director meets quarterly with the Chancellor and the USDA Director of Strategic Research to review governance and contract responsibilities. NuGrain uses several approaches to achieve fiscal accountability and independence in audits. These include random monthly audits of internal systems, an annual external audit, and piloting of standards from the U.S. Office of Management and Budget (OMB) Federal Funding and Transparency Act of 2006. NuGrain also uses an open performance review system that allows any stakeholder to view the results of the performance review meetings.
- Ethical and legal behavior is an organizational expectation for all staff members and partners. To support a no-tolerance environment for unethical behavior, NuGrain deploys systematic approaches such as ethics training for new employees, training on the responsible conduct of research, annual signings of the general and research Codes of Conduct, enforcement of the Codes of Conduct by the Research Integrity Officer and Legal/Compliance Officer, investigation of all allegations and hotline calls, and an internal audit. Based on an improvement in the ethics process, audit findings and scenarios are shared with SLs and the workforce for use in understanding and recognizing ethics issues. NFU and partner/supplier agreements include the Code of Ethics. NuGrain also has established measures and goals for many of these processes (Figure 1.2-2).
- NuGrain demonstrates effective, systematic approaches to reduce potential adverse impacts of its products and operations on the environment. The Environmental Protection Process uses environmental impact statements and risk management plans to identify compliance and societal risks, and it includes review by the SLT and the Ethics, Safety, and Research Review Committees. Public meetings are held annually at each site to share current and future project information and gather feedback from farmers, local citizens, and businesses. The feedback is used during the environmental scan portion of the SPP. NuGrain also demonstrates societal responsibility in its processes related to environmental well-being. Examples include the recapture of water, the use of solar cells and environmentally friendly fertilizer products, the establishment of Green Teams, and an environmental review of all new research projects. All of these approaches support the organizational value of respecting the land and the people who use it.
- The performance of all SLs is evaluated annually, and the NFU Chancellor reviews the Director’s performance. The BOT conducts its own annual self-assessment to identify opportunities for improvement. An organization-wide leadership development plan is created annually, using the strategic objectives, core competencies, and action plans as input, as well as individual leaders’ performance plans. Demonstrating organizational learning, NuGrain has improved and refined these approaches; for example, in 2005, it developed the Leadership Integration Model, and in 2006, it added workforce participation to the evaluation

of the leadership system.

OPPORTUNITIES FOR IMPROVEMENT

- While NuGrain has several mechanisms in place to protect stakeholder interests, including restriction of gifts, specifications for selecting suppliers, and compliance with hiring laws, it is not clear that each method has been deployed to all stakeholders. Specifically, these policies do not appear to address the interests of several identified stakeholder groups (Figure P.1-6), such as industry partners. Additionally, since the governance structure mainly involves NFU and the USDA, it is not clear how the other university and non-USDA funding agencies' interests are represented. A more comprehensive governance approach may help ensure that there are no gaps in the protection of stakeholder interests.
- While NuGrain states that it identifies key communities based on its core competencies, there is little evidence that a fact-based, systematic approach is used to determine those key communities. Additionally, although NuGrain indicates that it strengthens its key communities through voluntarism and environmental protections, it is not evident that all components of the workforce at all locations participate. For example, it is not clear how many scientists participate, whether staff members use their 24-hour allotment of work time for voluntarism, or whether students are involved in voluntarism that might support learning and provide opportunities for growth, such as participating in science fairs or partnerships with universities. Without a fully deployed, systematic process, NuGrain may not be addressing its value to “demonstrate leadership in all we do, in all the communities we serve.”

Category 2 Strategic Planning

2.1 Strategy Development

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- **NuGrain conducts planning annually through a 12-step SPP (Figure 2.1-1). Participants include SLs, the NFU Chancellor, industry partners, collaborating universities, program managers, and agricultural community members. Blind spots are identified through data analysis; the environmental scan; the strengths, weaknesses, opportunities, and threats (SWOT) analysis; and input from stakeholders. SWOT results are used to identify strategic challenges and advantages. The short-term planning horizon is set to allow for rapid changes in the political, economic, or regulatory environment, and the long-term planning horizon is set to align with research timelines and to stretch beyond the USDA contract timeline. The SPP is evaluated annually, and improvements include revision of planning horizons, the introduction of the Strategic Alignment Document, and the formation of the Metrics Infrastructure Group (MIG), which is responsible for providing data to leaders for performance review.**
- To help ensure that the SPP addresses various key factors, the MIG collects data and information for analysis by SLs one month before the planning retreat (see Figure 2.1-2). Data are collected on customer needs, industry trends, the competitive environment, technology shifts, human resource needs and capabilities, organizational capabilities, financial capabilities and needs, partner/supplier directions and capabilities, and regulatory issues. These inputs allow NuGrain to perform the SWOT analysis in Step 5 of the SPP. To ensure NuGrain's ability to execute the Strategic Plan, the budget, human resources, and information technology (IT) plans are aligned with the Strategic Plan, and progress is closely monitored throughout the year through NuGrain's performance review process so that action plans can be modified or added as needed.
- NuGrain utilizes the Strategic Alignment Document (Figure 2.2-1) to outline the strategic objectives that are determined during the SPP. Each objective is aligned to NuGrain's core competencies, strategic challenges, and strategic advantages. Each objective has associated key measures with short-term action plans, as well as both short-term and longer-term projections. In many cases, best-in-class or competitors' projections also are included. NuGrain considers input from all stakeholder groups during Step 1 of the SPP, and it includes representatives from industry and the agricultural community in the strategic planning retreat.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain identifies short- and longer-term projections in Figure 2.2-1, no goals are presented. Setting goals may serve to focus NuGrain more clearly on achieving its vision to be the premier government-owned laboratory system.
- It is not evident how NuGrain's strategic objectives balance short- and longer-term challenges and opportunities or address future core competencies. Additionally, while NuGrain uses key stakeholder input in the SPP, it is unclear whether this approach ensures that the strategic objectives balance the needs of all key stakeholders, such as NFU, collaborating universities, and students. This lack of balance may make it difficult to ensure organizational sustainability in light of NuGrain's key strategic challenges of uncertain funding, changing contract performance requirements, and competition with other contractors.

2.2 Strategy Deployment

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- Short- and long-term action plans are outlined in Figure 2.2-1. Key planned changes identified by NuGrain include improving key work processes to address stagnant or declining financial and human resources. SLs lead teams that include staff members, suppliers, and partners in developing short-term action plans and measures using the Work System Design Process. A standardized template introduced in 2002 is used to record and track action-plan progress, which the SLT reviews monthly as part of an organizational performance review. Action plans are deployed to the entire workforce through interactive Web-based sessions and meetings at each location. Workforce members' accountability for completion of action plans is incorporated into the performance plans that are part of the Workforce Performance Management (WPM) Process, and employee incentives are based on completion of action plans. Key supplier and partner responsibilities are reviewed monthly at supplier meetings.
- Human resource allocation occurs in Step 8 of the SPP. A ten-year workforce Capability and Capacity Plan is developed and linked to NuGrain's strategic short- and long-term action plans. For example, key elements of the plan that are aligned with NuGrain's strategic challenge of a declining number of agricultural graduates include recruitment, a development plan for new hires, scholarship support, and incentives.
- To identify the potential need to modify or revise action plans, the SLT conducts a monthly review of action plan templates and the SLT Scorecard (Figure 4.1-2) as part of the organization's performance review process. Strategic objective teams routinely review their metrics, and progress is communicated and needed changes identified through regular meetings with the workforce, the BOT, suppliers, and partners. Changing customer requirements, including changes related to policy and emergencies, also may necessitate modification of action plans. When changes are implemented, they are deployed through discussions and meetings.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain notes a few improvements (e.g., the 2002 introduction of a standardized template for action plan design and tracking and its 2003 revision to include budget information), there is no evidence that the approaches used to develop and deploy action plans are evaluated in a fact-based, systematic way to identify opportunities for improvement. A systematic approach in this area may support NuGrain's principal success factor of strong business practices that provide systematic, repeatable results.
- While strategic objective teams identify the performance projections for the organization and for competitors and best-in-class organizations provided in Figure 2.2-1 and many reported results, the approach the teams use to determine NuGrain's performance projections and those of its key comparisons is not evident. For example, while NuGrain notes that it

analyzes its competitive environment and considers prior performance against goals, it is unclear what steps are in place to estimate the organization's rate of improvement and change. Determining an effective approach may help NuGrain more accurately estimate future performance and its progress on achieving its vision.

- It is not evident that NuGrain has a systematic approach for assessing and managing financial and other risks associated with action plans. While NuGrain has a small contingency fund for unanticipated circumstances, it is not clear how this fund is set up, evaluated to mitigate potential risks, or deployed in times of need. A systematic approach to address these risks may be particularly important since upcoming changes may require NuGrain to do more with stagnant or declining resources, and it has identified the uncertain funding environment as a strategic challenge.

Category 3 Customer Focus

3.1 Customer Engagement

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- The Product and Service Offering Process (PSOP; Figure 3.1-1) is used to identify customer product offerings to meet customer requirements and expectations. This process is a component within the Research Portfolio Management Work System (Figure 6.1-1) and is overseen by the Product and Service Offering Committee (PSOC). The PSOP is a six-step process designed to incorporate and translate the voice of the customer (VOC) into research product features. Committee suggestions for revising the PSOP are submitted and reviewed annually. A recent improvement was to add industry partners and farmers to the committee.
- To build a customer-focused culture, NuGrain utilizes multiple systematic approaches, including the Touch Point program and the customer relationship management (CRM) process. Touch Point training, instituted in 2007 as a cycle of learning, provides the workforce with the communication tools it needs to effectively seek information and provide service to customers. The CRM process is used to enhance customer and stakeholder partnerships, and the Program Oversight Panel (POP) helps engage customers on an ongoing basis. Working together, these systematic approaches effectively support NuGrain's culture, which is designed to engage its customers and stakeholders.
- NuGrain identifies customer support requirements through the VOC Process (Figure 3.2-1), using information gathered through a variety of listening and learning mechanisms (Figure 3.2-2). The requirements are deployed through meetings, Hoedown Sessions, and Touch Point training. NuGrain uses multiple customer support and communication mechanisms (Figure 3.1-2), and the VOC Process provides opportunities to expand relationships with customers and stakeholders. Data gathered from the VOC Process are analyzed by the VOC Committee (VOCC) and used for organizational learning, as well as integrated into the SPP.
- NuGrain uses the Idea Well and its Innovation Service Now (ISN) component to help ensure a positive customer experience. An ISN Committee collects and trends data, selects ideas for improvements, and develops themes. The approach was deployed organization-wide in 2007. Via this approach, workforce members receive tokens of appreciation or bonuses for their ideas. NuGrain receives over 1,000 ideas per year using these methods.

OPPORTUNITIES FOR IMPROVEMENT

- It is not evident that NuGrain has a systematic process to identify and innovate product offerings to attract new customers. While potential customers are represented on the PSOC, it is not clear whether they include representatives from diverse geographies and market segments or how NuGrain uses their input or other methods to attract new customers. This potential gap may hinder NuGrain's efforts toward new and useful product development,

which it has identified as a key strategic thrust.

- Although all staff members receive Touch Point training, which includes customer support requirements, it is unclear how the training or the program is individualized to meet the varying communication needs of customers and other stakeholders. As a result, NuGrain may be missing opportunities to enhance its principal success factor of excellent and sustainable relationships with customers, suppliers, partners, and collaborators.

3.2 Voice of the Customer

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- The VOCC leads a well-deployed, systematic approach to determine current customer satisfaction and engagement. Metrics capture actionable information to use in exceeding customer expectations and to analyze and use in improvements. NuGrain uses multiple sources of satisfaction and engagement information, including the R-37 and E-10 surveys to obtain information on customer satisfaction and engagement with competitors, the quarterly E-10 to monitor customer engagement, the VOCC's review and analysis of CRM data, and the SLT's and program leads' use of data and information analysis. The use of the R-37 for non-USDA customers and the development of the E-10 to assess customer engagement are examples of refinements to this approach, which supports NuGrain's strategic advantages of long-term continuity of relationships and a strong reputation for research.
- NuGrain has multiple systematic, well-deployed, qualitative and quantitative methods for listening to and learning from current and future customers (Figure 3.2-2). The VOC Process (Figure 3.2-1), which is used to deploy these methods, is managed by the cross-functional VOCC, composed of SLs, program leads, and project leads, with all locations represented. Data and information are fed into the SPP, with improvement cycles in 2002 and 2005 that identified the need to gather more quantitative data and enhanced customer engagement data, respectively. Additionally, in a 2005 cycle of refinement, NuGrain began cultivating relationships with writers of leading journals, using PR Alert software to track media. In 2006, a key learning was to begin monitoring blogs for related news, customer trends, preferences, and information.
- NuGrain solicits customer complaints via monthly Performance and Engagement Review meetings. Complaints are immediately discussed with the customer to correct the issue and recover the customer's confidence. If warranted, the complaint is passed to the Process Team Process (PTP) for evaluation and improvement. In addition, complaint data are captured and aggregated with the CRM results, which then become inputs into the SPP environmental scan.

OPPORTUNITIES FOR IMPROVEMENT

- Although the Irritant Program captures just-in-time feedback on customer preferences and dissatisfaction to enable staff response before the irritant becomes a complaint, it is not evident that the process is fully deployed to all locations and relevant customer/partner groups. It also is not evident that NuGrain uses the data and information from the Irritant Program to improve other parts of the organization. Aggregating and analyzing information from the Irritant Program and the complaint process in a timely manner may assist NuGrain with increasing satisfaction, engagement, partnership, and long-term loyalty.

- While customer, market, and product information serves as input during Step 4 of the SPP, it is not evident how NuGrain uses this input to identify current and anticipate future customer groups and market segments or to identify and anticipate key customer requirements. In addition, although NuGrain makes use of customer and market information to improve marketing and identify opportunities for innovation, it is not clear how this information is used to build a more customer-focused culture. Without a systematic approach, NuGrain may have difficulty ensuring that it is making the most effective use of its multiple data sources.
- While NuGrain has various means to collect customer dissatisfaction data, it is not clear how this information is shared with relevant partners and used for improvement efforts. For example, it is not evident that NuGrain shares the information with industry partners, such as seed suppliers, equipment manufacturers, IT specialists, and GPS technology manufacturers, or with collaborating universities, including SurfU-Davis, Mississippi Universal University, and Pennsylvania Proper College. Fully deploying these processes may be important since NuGrain has identified excellent and sustainable relationships with partners as a principal success factor.

Category 4 Measurement, Analysis, and Knowledge Management

4.1 Measurement, Analysis, and Improvement of Organizational Performance

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- NuGrain’s systematic process for selecting, collecting, and integrating data for tracking operational performance (Figures 4.1-1 and 4.1-2) is well deployed throughout the organization. The Chief Technology Officer is the process owner and is supported by a Six Sigma Yellow Belt. The process is fully aligned, cascading through the organization through the contract process, the Performance Evaluation Plan (PEP), programs, processes, action plans, and departments. The Enterprise Architecture Process ensures consistent measurement and alignment at all user, data, and application levels, allowing tracking of daily operations and overall performance. Cycles of refinement include the addition of the Beedakers Framework in 2004, enhancement of the Project Learning and Analysis Tool System (PLANTS) to provide comprehensive portfolio management capabilities in 2007, and expansion of the Research Data and Information System (RDIS) to provide access to key partners in 2008.
- NuGrain reviews organizational performance following a systematic schedule that is aligned with contract, strategic, and other business needs (Figure 4.1-3). Performance reviews are conducted by all levels of the workforce to track progress on strategic objectives and action plans, research projects, key and nonkey processes, and process improvement projects. Leaders at multiple levels review scorecard indicators, program deliverables, department-level measures, and process improvement measures monthly. Weekly project reviews involve process teams and key partners.
- NuGrain has a systematic, well-deployed approach to translating performance review findings into action plans, setting priorities, and providing opportunities for improvement. Action plans are captured in a database that is analyzable through PLANTS. The SLT reviews action plan data aggregated by specific priorities, enabling it to set priorities based on a global review. A special PLANTS report keeps partners, suppliers, and collaborators informed of improvement priorities.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain states that it uses its Comparative Data Selection Process and Measure Selection Process (Figure 4.1-1) to select effective comparative data, it is not clear how these processes govern the selection and use of comparative data. Further, it is unclear how alignment matrices used in the Comparative Data Selection Process ensure effective use of comparative data or how the process supports top-box comparisons and innovation. Without a systematic approach for selecting and using the most effective benchmarks and other comparative data, NuGrain may be limited in its ability to evaluate its success relative to the industry and to competitors, as well as its progress on its vision of being the premier

government-owned laboratory system.

- Although NuGrain uses the Process Management Process (PMP) to keep its performance measurement system current with business needs and directions, it is not clear how the approach ensures that the system is sensitive to rapid or unexpected organizational or external changes. It also is not evident that performance analysis and review approaches are evaluated for effectiveness. Without a clear approach to improve the measurement system and keep it agile, NuGrain may have difficulty positioning itself to overcome its strategic challenges of competition with other contractors and changing contract performance requirements.
- While NuGrain conducts multiple organizational performance reviews (Figure 4.1-3), it is not clear that the reviews include performance in some areas that NuGrain has identified as key to its success. These areas include the cycle time for research, efficient farming, relationships, and participation in the community.

4.2 Management of Information, Knowledge, and Information Technology

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- NuGrain makes data and information available through systematic, well-deployed approaches via the intranet, a high-speed network that connects all research and operations sites that includes home pages customized for job type and responsibilities. As a cycle of refinement to the process in 2005, the portal concept was expanded to suppliers, partners, collaborators, and customers. To keep its data and information availability mechanisms current with business needs and technological changes, NuGrain conducts an Annual Process Performance Analysis that includes a review of data, information, and knowledge management processes. Employees and customers contribute ideas to the IT Idea Well for process improvements, as well as for new hardware and software. A five-year IT plan is used to prepare for organizational changes.
- NuGrain’s Information Management Contingency and Disaster Recovery Process is a systematic, effective approach to identifying, reducing, and managing risk associated with information systems. Process tools and analyses cover risk and site impact analysis, identification of critical components and their impact on other systems, and evaluation of the costs of system downtime and restoration. Information Systems uses these analyses to develop a Disaster Recovery Plan and a Contingency Plan for NuGrain. All plans are reviewed and revalidated annually. Systems are backed up off-site and are subject to monthly emergency preparedness drills.
- NuGrain uses multiple approaches (Figure 4.2-1) to help ensure the accuracy, integrity, timeliness, and security of organizational data and information. These approaches include trained data owners, certification of data sources, a System Testing Process, and onetime token cards for passwords.

OPPORTUNITIES FOR IMPROVEMENT

- **It is unclear whether NuGrain has systematic, fully deployed approaches in place to ensure the reliability and user-friendliness of its hardware and software. For example, although NuGrain uses formal enterprise processes to maintain systems and has a plan for emergencies, it is unclear if these processes are deployed to key technologies used for research, such as configurable laboratory technology or the nationwide virtual private network (VPN). In addition, it is unclear if NuGrain conducts pilot testing at all geographic sites to help ensure the user-friendliness of new products. Systematic approaches in these areas may help NuGrain support its core research competencies.**
- It is unclear if NuGrain fully addresses data confidentiality and security. For example, although the Knowledge Management Process deploys knowledge sets to defined users, it is unclear how NuGrain manages confidential or proprietary business intelligence and organizational knowledge to protect assets resulting from successful operation of its core

research business. For example, while the workforce signs the Codes of Conduct, it is not clear whether this or any other mechanism addresses nondisclosure or confidentiality issues. Likewise, it is unclear how NuGrain manages patent rights and ownership or how it protects proprietary information when workforce members leave the organization. Without clear processes to support the organizational value of demonstrating integrity in science and management of government assets, NuGrain may find it more difficult to ensure its principal success factors of engaging in high-risk research and attracting the brightest minds.

- It is unclear how NuGrain manages its organizational knowledge to facilitate identifying, sharing, and implementing best practices. For example, it is not clear how monthly meetings and Idea Wells systematically transfer needed information and best practices. Nor is it clear how the PDP and PMP are used for this purpose. Enhancing processes for sharing best practices so that the transfer of knowledge is fully deployed may increase innovation and efficiencies across NuGrain's large organization.

Category 5 Workforce Focus

5.1 Workforce Engagement

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- NuGrain uses multiple approaches to encourage its culture of open communication, an engaged workforce, and respect for diverse opinions. One method is the Idea Wells. Ideas go to the Well Team, which reviews and immediately implements those considered to be quick wins. More complex ideas are shared with process owners and process Six Sigma Yellow Belts. Other methods used to encourage an exchange of ideas across the organizational disciplines include quarterly colloquiums at rotating sites, monthly operational forums, and the Scientific Peer Research Review (SPRR) Process. A 2007 improvement cycle initiated communities of interest and discussion groups that communicate across the organization through the Internet and intranet.
- NuGrain’s learning and development system systematically addresses workforce learning and development needs, transfer of knowledge from departing and retiring workers, and reinforcement of new knowledge and skills on the job. The system includes shadowing or cross-training with retiring employees, risk management audits, regular competency checks, and on-the-job learning. Learning needs are identified in workforce performance plans and are aggregated to determine knowledge gaps. Programs are then developed to address the gaps. NuGrain also uses an extensive computer-based training library to support self-identified training needs and career development. These approaches demonstrate a commitment to both organizational and individual learning and align with the workforce satisfaction and engagement factor of the opportunity to grow and learn.
- NuGrain worked with the NFU Education Department to develop a systematic evaluation process for its training curriculum. NuGrain uses all four levels of the Ebonywood Model for Assessment to evaluate training effectiveness. Data are gathered at each evaluation level and used as inputs into the biannual curriculum review to determine if there are opportunities for improvement. Efficiency of the learning and development system is measured through several approaches, such as dollar investment per workforce member and participation in online training and mentoring. Data on accident rates and safety violations are used to track the effectiveness of safety training.
- The WPM Process provides the foundation for workforce career progression. The Work System Design Process (Figure 6.1-2) includes the identification of performance expectations, skills, and competencies, along with requirements for training and development for each work process and job category. This approach supports alignment with the strategic objectives and a focus on efficient and effective processes for workforce development, career goals, and job progression. Plans are reviewed quarterly to monitor progress on career goals and job progression strategies. Additionally, new hires are assigned buddies to help them adjust to NuGrain, and mentors are available for workforce members who are looking for job

or career development assistance. NuGrain has established a Succession Planning Process (Figure 5.1-3) that is implemented through a Leadership Development Plan managed by a Leadership Development Committee at each site and linked to the organization's strategies and the Human Resource Plan.

OPPORTUNITIES FOR IMPROVEMENT

- While NuGrain states that the WPM Process and Work System Design Process are used to accomplish career progression and has a systematic Succession Planning Process (Figure 5.1-3) for leadership and management positions, it is not clear how these approaches manage effective career progression for all segments of the workforce, including fellows, junior and senior scientists, and the highly technical, expert scientists in fields such as gene splicing and natural-based fuels. The lack of an effective approach to manage career progression for workforce members with specialized research competencies may affect NuGrain's sustainability, as well as innovation, achievement, and the ability to secure highly competitive funding.
- The Employee Workforce Assessment (EWA), which was initiated in 1995, is used annually as NuGrain's primary approach to assess workforce engagement and satisfaction. However, it is not clear how this assessment tool or other informal processes differ across NuGrain's multiple workforce segments. In addition, it is not evident that the EWA has undergone any additional cycles of improvement since 2000. Without cycles of improvement, as well as assessment methods tailored to its diverse workforce segments and their varying satisfaction and engagement factors, NuGrain may miss information that is critical to retaining a high-quality workforce.

5.2 Workforce Environment

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- To assess workforce capability and capacity needs, NuGrain’s Recruitment and Staffing Team conducts an annual assessment using the Six Sigma Process. The team gathers information from program and project leads at all locations to verify current and projected needs. Key process performance data are reviewed, and a matrix is constructed to determine the needed skill mix, competencies, and staffing levels. The Recruitment and Staffing Team uses this information to project staffing needs, create a staffing matrix, and update the ten-year Capability and Capacity Plan. This process led NuGrain to identify a potential downturn in funding in 2006, which resulted in an initiative to begin training and knowledge-sharing meetings on research in renewable energy, enabling NuGrain to be well positioned to help the USDA lead this effort. This process is consistent with meeting NuGrain’s key success factor of attracting the brightest minds in agricultural science and technology.
- NuGrain uses a multistep Recruitment and Hiring Process (Figure 5.2-1) that includes a Diversity Council at each location to recruit, place, and retain new members of the workforce. The process is integrated with NuGrain’s staffing matrix. The process includes behavioral interviews and may include testing for some positions. NuGrain uses a Workforce Referral Program that gives employees a bonus for referring successful applicants. To remain current with changing business needs, NuGrain conducts an annual review of its recruitment and retention policies and procedures that has led to multiple cycles of improvement.
- NuGrain uses multiple approaches to manage and organize the workforce to accomplish work. These approaches integrate with NuGrain’s work systems; the Process Portfolio Management Work System and the Research Portfolio Management Work System (Figure 6.1-1) are used to help translate customer requirements and strategic objectives into multiyear research programs. NuGrain uses the Work System Design Process to design and monitor its key processes to capitalize on core competencies and Review the organization structure of teams and work systems. Leveraging one of its strategic advantages, NuGrain uses the Prime Contract Management Process to define product specifications, performance expectations, and staffing requirements.
- NuGrain organizes support of its workforce via services, benefits, and policies around four focus areas (Figure 5.2-2) that serve to integrate the identified factors related to workforce satisfaction and engagement (Figure P.1-4). The array of offerings covers the major areas identified, and NuGrain tailors these offerings to meet the needs of its diverse workforce by allowing individuals to select those that best meet their needs. The set of services, benefits, and policies is reviewed annually by focus groups at each site that are constructed to represent each of the workforce segments. Feedback from these focus groups is used to identify improvements to the offerings and has resulted in upgrades such as the recent addition of dependent care benefits to address the growing number of workforce members with small children and/or aging parents.

OPPORTUNITIES FOR IMPROVEMENT

- While NuGrain lists numerous approaches to address workforce health, safety, and security, the performance measures and improvement goals NuGrain has established to address workforce needs are not clear. For example, while a few health and safety measures are listed in Figure 2.2-1, it is not clear how these are aligned to specific workforce needs. Identifying a set of aligned measures with goals for a safe and healthy workplace environment may help NuGrain manage and improve these processes.
- NuGrain has indicated a strategic challenge of a declining number of agriculture graduates and identifies several approaches to help retain employees; however, these approaches appear to be limited in scope and deployment. For example, while NuGrain identifies the employee-supervisor relationship as having a strong correlation to retention, it is not evident that NuGrain's assessments have included other factors, such as compensation and career growth opportunities. It also is not clear if these correlations and other approaches have considered variations in job types and geographical locations among NuGrain's diverse workforce segments. This may limit NuGrain's ability to retain key workforce members, potentially interrupting key research, partnerships, contracts, and other business-critical areas.

Category 6 Process Management

6.1 Work Systems

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- NuGrain uses the Work System Design Process (Figure 6.1-2), which is owned by the SLT, to design its work systems. The process considers both core competencies and capabilities. A process salience scoring matrix is used to help determine key internal processes, and processes not determined to be key are evaluated for potential outsourcing. Several processes have been outsourced over the years, resulting in significant cost savings. Over time, this approach has been used to reduce the number of key work processes by 40 percent. Other refinements have resulted from the improvement approach that is embedded within the process. This approach supports NuGrain’s efforts toward strong business practices that provide systematic, repeatable results in business management, which NuGrain has identified as a principal success factor.
- NuGrain uses the Work System Design Process (Figure 6.1-2) to ensure that the organization capitalizes on its core competencies. Core competencies have been deployed to key processes using this approach (Figure 6.1-3). For example, core competencies are embedded in key work processes and job descriptions. Additionally, the WPM Process ensures that core competencies are built into education, training, and performance plans.
- NuGrain uses site emergency plans to help ensure workplace preparedness for disasters and emergencies. The plans, which are approved by the Emergency Director, include components such as categorization of emergencies, assessment of hazardous material conditions, and protective actions to prevent emergencies. These plans are updated and reapproved annually as part of the SPP. To facilitate organizational learning, annual performance review and improvement workshops are held. These workshops have resulted in several improvements and refinements, such as an electronic hazardous material inventory.
- NuGrain has identified 22 key processes that contribute to organizational success, financial return, and customer value, as well as their associated key requirements and measures (Figure 6.1-4). These processes are segmented as Program Management Processes, Project Management Processes, and Enabling Processes. With this approach, program and project deliverables are tied to annual contract performance ratings and to NuGrain’s award fee. NuGrain’s process teams use Six Sigma tools (e.g., Suppliers-Inputs-Process-Outputs-Customers [SIPOC] maps, value stream maps, and relationship maps) to formally document each process in a process specification document. These teams include suppliers, partners, and collaborators, as appropriate.

OPPORTUNITIES FOR IMPROVEMENT

- **It is not clear whether NuGrain’s site emergency plans address continuity of operations other than for information systems. For example, plans for continuity of operations that may be necessary in the event of natural disasters, such as fires, floods, tornadoes, and blizzards, are not evident. This may be particularly important since NuGrain operates in four diverse geographic areas, and NuGrain’s strategic advantages include well-established facilities as well as long-term continuity and uninterrupted support.**
- A key element of NuGrain’s strategy for ensuring that key processes contribute to organizational success, financial return, and customer value is for program leads to engage their USDA counterparts during the annual PEP Negotiation Process; however, it is not clear that NuGrain has deployed this approach (or additional approaches) to its other customer groups—other government agency program managers and WFO program managers (Figure P.1-6). Such deployment may be particularly important since NuGrain has identified one of its principal success factors as excellent and sustainable relationships with customers, and the WFO and other government agencies contribute 30 percent of the organization’s funding.

6.2 Work Processes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5a, Scoring Guidelines for Process Items.)

STRENGTHS

- **NuGrain manages its process designs as projects using the Process Design Process (PDP) and the Six Sigma Define-Measure-Analyze-Design-Verify (DMADV) Process. In step four of the DMADV Process, factors such as cost, quality, and cycle time are considered. The PDP has a formalized process handoff that includes the process specification document, process measures, training, and updated procedures, as needed. The process handoff also includes 90-day and 180-day process reviews to ensure that the process is performing as designed. Process performance gaps trigger a Define-Measure-Analyze-Improve-Control (DMAIC) Process. This approach includes Process Design Teams that are led by Six Sigma Black Belts and may include customers, suppliers, and partners, as needed. Work process innovation occurs in the Analyze step of the DMADV Process through benchmarking and innovation brainstorming.**
- NuGrain utilizes a systematic approach to implement and manage its work processes. For example, the six-step PMP is used to ensure that day-to-day operations meet key requirements. Process Yellow Belts monitor processes using measures that are in PLANTS and RDIS. Most process teams include customer and stakeholder representatives. Key measures and indicators used to control and improve key processes have been defined (Figure 6.1-4).
- To improve its work processes to achieve better performance, NuGrain uses four approaches: the Annual Process Performance Analysis, Lean-Kaizen Blitzes to address issues from the monthly PEP reviews, the PTP, and external program reviews. Several of these approaches utilize Lean or Six Sigma methods. All four methods use the Idea Wells as sources of ideas and repositories for lessons learned. Some of these processes have gone through cycles of refinement and improvement.
- NuGrain uses multiple approaches, including the deployment of the PDP and PMP, to control costs and to prevent defects and rework. NuGrain also utilizes the Stage-Gate Process (Figure 6.2-1), which is designed to reduce program uncertainty and risk. Each gate is designed to prevent rework costs in succeeding stages. These approaches support NuGrain’s strategic advantage of strong results and efficient processes, as well as its principal success factor of strong business practices that provide systematic, repeatable results in business management.

OPPORTUNITIES FOR IMPROVEMENT

- While NuGrain identifies four methods it uses to improve its work processes, it is not clear whether the four methods have been fully deployed at all sites and across all workforce segments. For example, it is not clear if Six Sigma Yellow Belts and Black Belts at all sites have access to each other’s projects and thus share lessons learned. Given the dispersed nature of NuGrain’s workforce and processes, opportunities to share best practices or learn

from others may be missed, thus raising the potential for missed opportunities to improve work processes.

- While NuGrain involves customer and stakeholder representatives in most process teams, it is not clear that this approach is well deployed and systematic. For example, the types of customers and examples of inputs that they are providing are not evident. Additionally, it is not clear how customer and supplier inputs are considered when they are not included on these process teams, and partners' and collaborators' roles in work process management are not clear. This may limit NuGrain's ability to fully achieve its potential in the area of work process management.
- It is unclear how NuGrain's process review timelines support keeping processes current with business needs, including the organizational agility to meet changes in those needs. Of NuGrain's four methods to improve work processes, three occur on a yearly timetable. It is unclear how NuGrain responds in a timely manner to changes in the research or business environment that arise during the yearly cycle. NuGrain may benefit from having approaches in place to quickly address challenges and changes that affect sustainability, such as uncertain funding, reduced funding for general crop research, and increased competition from larger organizations.

Category 7 Results

7.1 Product Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- **Several product performance results demonstrate good performance levels, beneficial trends, and favorable comparisons with NuGrain’s best USDA competitor. The percentage of incentive award fees earned (Figure 7.1-2), an indicator of meeting customer requirements for achievement of contract deliverables, increased from about 5 percent in 2006 to 9.4 percent in 2009, compared with about 5.5 percent for the best competitor that year. The number of patents awarded (Figure 7.1-3) increased from 10 in 2003 to more than 45 in 2009, which is 17 percent above the best competitor’s 2009 performance. NuGrain has far exceeded its best competitor in the number of articles published in peer-reviewed journals (Figure 7.1-4), with 3,000 total in 2009, compared with 2,400 for the best competitor. Segmented results indicate that the Efficient and Precision Farming research program contributes the majority of the publications.**
- From 2003 through 2009, NuGrain’s results show good performance levels and steadily improving trends for areas important to the agricultural community market segment. For example, the value increase for Crop Yields (Figure 7.1-5) improved from \$10 to \$150 per acre, savings on Fertilizer and Pesticide Usage (Figure 7.1-6) trended favorably from \$1 to \$24 per acre, and Soil Erosion (Figure 7.1-7) was reduced from 2.5 to approximately 0.8 tons per acre. NuGrain’s performance on all three of these measures has compared favorably with that of its best competitor since 2006.

OPPORTUNITIES FOR IMPROVEMENT

- **Results are not provided for several areas of importance to the accomplishment of NuGrain’s mission. For example, NuGrain does not report results for several strategic thrust areas, such as enhancing the taste of healthier products (Better Nutrition Approaches); new or more useful products from plants, including fiber-conversion products (New and Useful Product Development); and fertilization in different growing environments (Grain Safety and Resistance). In addition, results are not presented for NuGrain’s core competency of specialized research competencies, such as corn or wheat enhancements from gene engineering or crop nanotechnology. Also, there are no results related to the success factor of the ability to engage in high-risk research. Measuring and monitoring the product outcomes of all relevant research focus areas may help NuGrain leverage its core research competencies, build its competitive position in an uncertain funding environment, and take greater advantage of its ability to adapt to changing research priorities.**

- The product results presented include limited or no segmentation by product offerings, customer segments, or market segments. For example, while the segmentation by strategic thrust area for Published Articles (Figure 7.1-4) provides information on the progress of NuGrain’s various research programs, results for Patents Awarded and Commercialized (Figure 7.1-3) are not segmented. Likewise, while results for Increase in Grain Protein Content (Figure 7.1-8) are segmented by location, giving insight into outcomes from different growing environments, no segmentation is provided for Crop Yields (Figure 7.1-5), savings on Fertilizer and Pesticide Usage (Figure 7.1-6), or reductions in Soil Erosion (Figure 7.1-7).
- Some comparisons may not support NuGrain’s vision to be the premier government-owned laboratory system. Specifically, most results are compared with those of competitors, not necessarily with best-in-class benchmarks. For example, comparisons of Published Articles (Figure 7.1-4) with those of USDA competitors do not take into account the many other laboratories outside the USDA realm. Results for Increase in Grain Protein Content (Figure 7.1-8) are compared with the best competitor’s average, and the Bellefonte site has remained below that average for five years. Increased use of best-in-class comparative data may increase NuGrain’s opportunities to identify best practices and demonstrate its organizational value of “leadership in all we do.”

7.2 Customer-Focused Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- Several results for customer satisfaction show beneficial trends and favorable comparisons. Ten measures related to USDA Satisfaction with Research Program Elements (Figure 7.2-1) and Satisfaction with Research Project Elements (Figure 7.2-2) show significant improvement from 2005, when scores ranged from 75 to 80 percent, to 2009, with scores ranging from 86 to 95 percent. Projections through 2014 predict continued improvement. In 2009, NuGrain outperformed two key competitors in all ten measures, and it equaled the best R-37 score in six of the measures. These results support NuGrain’s vision to be the premier government-owned laboratory system.
- NuGrain demonstrates good performance levels and beneficial trends for customer loyalty, a key indicator of customer engagement. Results for USDA Customer Loyalty (Figure 7.2-11) show that this customer’s likelihood to renew NuGrain’s contract increased from 80 percent in 2005 to about 95 percent in 2009, compared with approximately 72 percent and 62 percent for its two top competitors and equaling the best score. The likelihood to contract for additional research improved from 80 percent in 2005 to approximately 93 percent in 2009, compared to 60 percent and 70 percent for the top competitors and approaching the best score. Likewise, during this same time period, other customers’ loyalty as shown by their likelihood to contract for additional research (Figure 7.2-12) increased from 70 percent to about 88 percent for other government agencies and from approximately 65 percent to 80 percent for WFOs.
- NuGrain demonstrates strong results for engagement through the customer life cycle and for the effectiveness of its engagement methods. Results for overall Engagement through the Customer Life Cycle (Figure 7.2-13) from 2005 to 2009 show improvement from 67 percent to 95 percent for the USDA, from 64 percent to 87 percent for other government agencies, and from 60 percent to 87 percent for WFOs. Likewise, the score for Effectiveness of Engagement Methods (Figure 7.2-14), increased during this time period from an overall rate of 86 percent to 93 percent for the USDA, from 75 percent to 88 percent for other government agencies, and from 74 percent to 90 percent for WFOs.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain measures and monitors customer satisfaction, comparisons are limited. For example, comparisons are not provided for results related to the satisfaction of the scientific and agricultural communities, collaborating universities, or students (Figures 7.2-6 through 7.2-9). Without comparisons, NuGrain may have difficulty assessing its progress in addressing challenges affecting its sustainability, such as the uncertain funding environment and competition with other contractors.

- Although very few formal complaints are filed against NuGrain, results are missing for in-process measures of customer and stakeholder dissatisfaction. For example, NuGrain maintains a system to capture customer irritants, yet no results are reported for this measure of customer dissatisfaction. Without fully measuring and monitoring customer dissatisfaction, NuGrain may overlook opportunities for improvement with a customer group that, if addressed, may lead to higher levels of organizational performance and customer loyalty.
- Results are limited for measures of the engagement and loyalty of all of NuGrain’s key market segments and customer groups. For example, no results are reported for the agricultural or scientific communities. Also, while NuGrain provides overall loyalty and engagement results for the customer groups of non-USDA government agencies and WFOs (Figures 7.2-12 and 7.2-13), such results are not provided for individual organizations within those groups. Without results data in these areas, NuGrain may miss an opportunity to build or maintain key relationships with organizations that influence the organization’s long-term sustainability.

7.3 Financial and Market Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- In keeping with its vision of becoming the premier government-owned laboratory system, NuGrain shows strong, steady Funding Growth (Figure 7.3-1) from \$20 million in 1997 to almost \$2.4 billion in 2009. NuGrain’s performance on this measure was equal to or better than two key competitors in 2008 and 2009. Additionally, NuGrain’s growth in funding from other government agencies and its WFO program reflects its efforts to address the sustainability challenge of uncertain funding with a dependency on a single main funding source; results for Funding Sources by Customer Group (Figure 7.3-5) display a decrease in USDA funds from 100 percent in 2001 to about 70 percent in 2009, while funding from other government agencies grew from zero in 2003 to over 20 percent in 2009, and WFO funding increased about 8 percent from 2003 to 2009. Projections through 2014 are presented that predict continued improvement.
- NuGrain demonstrates positive results for measures of financial performance tied to its strategic challenges of the high cost of entry into new research programs and competition with other contractors. Overall Performance to Budget (Figure 7.3-2) shows steady performance levels below budget, ranging from 96 to 99 percent from 2005 through 2009. Project Overhead Costs (Figure 7.3-6) show a steadily improving trend from 40 percent in 2003 to about 17 percent in 2009. NuGrain’s performance on this measure has been better than a key competitor’s since 2007. Results for Contract Fees (Figure 7.3-7) demonstrate a steadily improving trend from approximately 22 percent of budget in 2005 to about 12 percent of budget in 2009. On this measure, NuGrain has performed better than two competitors since 2007. All three results contain projections through 2014 that predict continued improvement.
- NuGrain’s market share of USDA government-owned, contractor-operated (GOCO) research (Figure 7.3-9) steadily increased from 20 percent in 2005 to 40 percent in 2009, and its performance has been equal to or better than two competitors’ since 2008. The market share of USDA overall research funding (Figure 7.3-10) steadily increased from 5 percent in 2005 to 10 percent in 2009, despite declines in funding from the USDA. NuGrain’s performance has been equal to or better than two competitors’ since 2008. Projections reported for both measures show continued improvement. These results are aligned with NuGrain’s vision to be the premier government-owned laboratory system.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain indicates that it determines comparative data through the Measure Selection Process, results for measures of financial performance contain data for only a few of its competitors and no other comparisons or benchmarks. For example, Figures 7.3-1, 7.3-2, and 7.3-7 related to Funding Growth, Overall Performance to Budget, and Contract Fees report results for only two competitors, and no other comparative data are provided. Results

for Project Overhead Costs (Figure 7.3-6) include data for only one competitor, and no other comparisons are presented. Not tracking the results of all key competitors and other comparisons may result in an inaccurate picture of NuGrain's organizational performance and may hamper its efforts to be the premier government-owned laboratory system.

- NuGrain does not report results for several measures of financial performance; these include the value related to the over 300 patents that NuGrain has received, funding for high-risk research, and the results of Foundation investments or other measures of the Foundation's performance. Additionally, NuGrain does not report its marketplace performance for elements of its funding community market segment, such as the U.S. Department of Energy, U.S. Department of Homeland Security, U.S. Department of Health and Human Services, and National Science Foundation, or for WFOs. Not tracking and reporting these key measures may limit NuGrain's ability to be successful in a marketplace of competition with other contractors, uncertain funding, and declining numbers of agricultural graduates.
- It is unclear whether NuGrain's projected overall funding growth is supported by its projections of growth from separate funding sources and other financial data. NuGrain projects overall funding growth of 67 percent from 2009 to 2014 (Figure 7.3-1). At the same time, the percentage of funding from the USDA is projected to continue a decline evidenced since 2003. Funds from other sources are projected to grow by less than 20 percent, from 22 percent in 2009 to 30 percent in 2014 (Figure 7.3-5). Other factors such as Overall Performance to Budget (Figure 7.3-2) and Market Share (Figures 7.3-9 and 7.3-10) are projected to remain relatively stable until 2014. It is unclear how the projected growth will take place without larger increases in funding from other government agencies and WFOs. Without clearly justified growth projections, NuGrain may not be able to overcome its strategic challenge of uncertain funding.

7.4 Workforce-Focused Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- **Several results for workforce engagement and satisfaction demonstrate good performance levels and beneficial trends. Results from the EWA for Engagement Overall and by Segments, Engagement by Location and Years of Service, and Engagement by Education and Ethnicity (Figures 7.4-1 through 7.4-3) show improvement for all segments from 2005 to 2009, with NuGrain’s 2009 overall engagement score at about 4.1 on a 5-point scale, compared with the best peer at 4.0. During the same time period, results for Engagement on Elements of Organizational Health (Figure 7.4-4) show improvement to 4.0 or above for all seven elements, with scores in all elements but one (feedback) equaling or surpassing the best peer’s scores. Results for Workforce Satisfaction (Figure 7.4-5) show improvement from 2005 to 2009 on three of the five measures. Some measures, including teamwork, knowledge sharing, rewards and recognition, training, and compensation and benefits, are aligned with NuGrain’s key workforce motivation and satisfaction factors. Most measures include projections through 2014 that forecast continued improvement.**
- Results related to workforce health and safety have shown significant improvement in both the number and the severity of incidents over the past six years. From 2003 to 2009, the number of Total Recordable Cases (TRC) per 200,000 work hours (Figure 7.4-12) declined from about 1.1 to approximately 0.8 for lab workers and from nearly 5 to about 3.1 for farm workers, with 2009 performance for both workforce segments equal to the best competitor’s and exceeding the Occupational Safety and Health Administration (OSHA) 80th percentile. Likewise, the number of Days Away/Restricted Time (DART) per 200,000 work hours (Figure 7.4-13) has declined for both these workforce segments over the past six years. Results for Workforce Health, Safety, and Security: Reported Incidents (Figure 7.4-14) show improvement in five of the six reported categories from 2006 to 2009, with three of the categories (chemical and electrical hazards, incidents related to lab equipment use, and security incidents) experiencing substantial reductions. These results reflect NuGrain’s focus on safety excellence, which it has identified as a key element of its workforce climate.
- Results for Students Choosing Careers in Agriculture (Figure 7.4-10) show that the number of interns remaining with NuGrain or staying in the industry has been increasing since 2005. The number of students that have remained with NuGrain increased from about 26 percent in 2005 to 35 percent in 2009, compared with 14 percent and 10 percent for two of NuGrain’s competitors, whose performance levels also show a decrease from 2007 to 2009. These results indicate NuGrain’s success in addressing its strategic challenge of a declining number of agricultural graduates.
- Several results provided for workforce capability and workforce capacity demonstrate a

beneficial trend. NuGrain's Training Effectiveness by Assessment Level (Figure 7.4-8B) steadily improved for each level from 2005 to 2009 and has outperformed the best competitor's results since 2007. Hiring Cycle Time and Costs (Figure 7.4-9) have been cut by 50 percent, from 120 days and \$6,000 per hire in 2001 to 60 days and \$3,000 per hire in 2009. Results from 2005 to 2009 for Employee Voluntary Turnover (Figure 7.4-11) show good performance levels and beneficial trends for most workforce segments, with the overall turnover rate improving from approximately 7.2 percent to about 6.1 percent, compared to more than 7 percent for NuGrain's key competitor. These results are aligned with NuGrain's workforce satisfaction factors of adequate staffing and career support.

OPPORTUNITIES FOR IMPROVEMENT

- **NuGrain has not provided results for many measures of engagement and satisfaction identified as important by its workforce. Not reported are results for measures such as scientific freedom, access to state-of-the-art technology, opportunity to publish and present, tools to do the job, work experience while in school, job security, challenging and meaningful work, effective support processes, flexible hours, and adequate staffing (Figure P.1-4). This gap may make it more difficult to attract the brightest minds in agricultural science and technology, which NuGrain has identified as a principal success factor.**
- Although NuGrain reports results for Training Investment (Figure 7.4-6) by employee and student and for Participation in Training and Development Activities (Figure 7.4-7), these metrics do not appear to clearly indicate the overall development of employees, especially leaders. In addition, these results are not segmented by NuGrain's workforce groups (job types and locations). Results in these areas may help NuGrain assess whether it is developing its employees to align with the organizational value of cultivating innovation and creativity and whether it is affording the workforce the opportunity to grow and learn—a key factor in engagement and satisfaction.

7.5 Process Effectiveness Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- Several process effectiveness outcomes demonstrate good performance levels and beneficial trends that are aligned with the key customer requirement of reduced cycle times, as well as NuGrain's success factor of the cycle time to bring research opportunities to commercialized use. Research Total Cycle Time (Figure 7.5-1) shows improvement in strategic thrust areas and overall, with overall performance improving from 39 months in 2003 to 30 months in 2009 and performance better than the best competitor's since 2005. Collaborative Agreement Cycle Time (Figure 7.5-7) improved from approximately 153 days in 2005 to fewer than 60 days in 2009, comparing favorably with the best competitor's level of about 80 days. From 2004 to 2009, results for Research Project Stage-Gate Cycle Time (Figure 7.5-8) show an improvement in total cycle time from approximately 1,110 days to about 900 days, and those for Research Program Stage-Gate Cycle Time (Figure 7.5-9) show total cycle time improving from about 330 days to 140 days. In addition, results for both materials and subcontractor cycle time (Figure 7.5-15) improved from 2005 to 2009, outperforming the best competitor and the national research laboratory best-in-class comparison, respectively.
- Results for several key measures of work system performance show beneficial trends and favorable comparisons. External Peer Review Scores (Figure 7.5-2) show improvement for all strategic thrust areas, and NuGrain's overall score increased from approximately 91 percent in 2003 to 96 percent in 2009, with results equal to or better than the best competitor's since 2006. In addition, from 2003 to 2009, the overall Stage-Gate Approval Rate (Figure 7.5-3) improved from approximately 72 percent to about 86 percent. During the same time period, the Process Management Efficiency Ratio (Figure 7.5-4) improved from about 100 to approximately 1,700, with performance equal to or better than the best competitor's the last two years. These results reflect NuGrain's success in meeting the key customer requirement of effective program execution.
- Results for several measures of work process performance demonstrate sustained good levels of performance and/or beneficial trends. Results for Information Management Performance (Figure 7.5-14) show that system availability increased from 99.5 percent in 2001 to over 99.9 percent in 2009, equaling the best-in-class comparison, while system vulnerabilities decreased from 0.5 percent to 0.2 percent. In addition, results for Total Project Cost vs. Baseline Project Cost (Figure 7.5-10) show performance from 2004 to 2009 within the good range of 0.95 to 1.05, while the best competitor's performance was outside this range from 2006 through 2008. This result indicates NuGrain's success in addressing customer requirements related to cost.

- NuGrain’s Idea Well suggestions and implementations (Figure 7.5-16) have both increased. From 2005 to 2009, submissions increased from 586 to 1,129, and implementations grew from 92 to 564. These results may be particularly noteworthy since the Idea Well process is integrated at various points within the organization and is a key part of NuGrain’s performance improvement system.

OPPORTUNITIES FOR IMPROVEMENT

- NuGrain provides limited or no results for some measures that the organization may need to assess its overall work system effectiveness. For example, while NuGrain provides results from its emergency drills (Figure 7.5-6; NuGrain Emergency Readiness Rating), results are not provided for any of NuGrain’s other approaches for workplace preparedness for disasters, such as the effectiveness of the Information Management Contingency and Disaster Recovery Process. Also, NuGrain identifies several processes that are performed by suppliers and partners but does not provide results for these processes. In addition, results are not provided for measures that address supply chain requirements for key suppliers (Figure P.1-7), such as quality, on-time delivery, flexible/tailorable solutions, best value, knowledge transfer, fair treatment, innovation, and capable staff members. The absence of these results may limit NuGrain’s overall work system efforts.
- Results for several process effectiveness measures do not demonstrate performance levels that support NuGrain’s vision of being the premier government-owned laboratory system. For example, in results for Prime Contract Management Performance (Figure 7.5-11), the percentage of milestones delivered on time, while improving from 2001 to 2009, remains below the performance level of the best GOCO. Similarly, NuGrain’s Commercialization Process Performance (Figure 7.5-13) has improved, but only to a 2009 level equal to the national research laboratory average.

7.6 Leadership Outcomes

Your score in this Criteria Item for the Consensus Review is in the 50–65 percentage range. (Please refer to Figure 5b, Scoring Guidelines for Results Items.)

STRENGTHS

- NuGrain demonstrates good to excellent performance for the accomplishment of its strategic objectives (Figure 7.6-1), with an overall average of 94 percent of near-term and 88 percent of long-term action plans completed in 2009. These plans, which are important for identifying opportunities for related research and the sustainability of the organization, are related to results such as Patents Awarded and Commercialized (Figure 7.1-3) and USDA Customer Loyalty (Figure 7.2-11). Additionally, NuGrain has met 100 percent of its near-term and 93 percent of its long-term completion rates for action plans related to building the capability and capacity of its workforce, a strategic challenge (Figure 7.6-1).
- Results for numerous indicators of fiscal accountability, ethical behavior, legal compliance, and governance show sustained high performance levels and/or beneficial trends. For example, from 2005 to 2009, nine measures of fiscal accountability (Figure 7.6-2) show good levels and beneficial trends, including zero USDA and OMB external audit material weaknesses and 100 percent compliance with Sarbanes-Oxley/Internal Revenue Service 990. Eight measures of regulatory and legal compliance (Figure 7.6-3) also show good levels and beneficial trends, with no Equal Employment Opportunity Commission validated complaints or USDA findings from 2005 to 2009. Results for ethical behavior (Figure 7.6-4) show 100 percent ethics training attendance, signing of both Codes of Conduct, and America COMPETES Act compliance in 2009, as well as zero ethical violations for five years. Also, results for Workforce Members' Trust in Senior Leaders/Governance (Figure 7.6-5) segmented by the multiple workforce groups show improvement from 2006 to 2009, with the 2009 overall average exceeding the top peer and national top 10 percent comparisons. These results align with the organizational value of integrity.
- NuGrain demonstrates beneficial trends for the organization's fulfillment of its societal responsibilities in regard to "Greening" the Environment (Figure 7.6-8). Results from 2005 to 2009 show improvement in can recycling from 8.5 tons to 8.8 tons, electronics recycling increasing from 0.23 tons to 0.28 tons, green waste decreasing from 80 tons to 72 tons, safe disposal of hazardous materials increasing from 95 percent to 100 percent, and gasoline usage decreasing from 11.5 tons to 9.1 tons. Results for two of the measures (safe disposal of hazardous materials and gasoline usage) demonstrate 2009 results equal to the top peer's. These results align with the organizational values of integrity and respect for the land and the people who use it.

OPPORTUNITIES FOR IMPROVEMENT

- Although NuGrain provides results for overall support of its key communities through voluntarism (Figure 7.6-9), results are not presented for some of the specific community support actions identified in Item 1.2. For example, results are missing for leadership participation in community service, grants for farmers to purchase equipment, specific

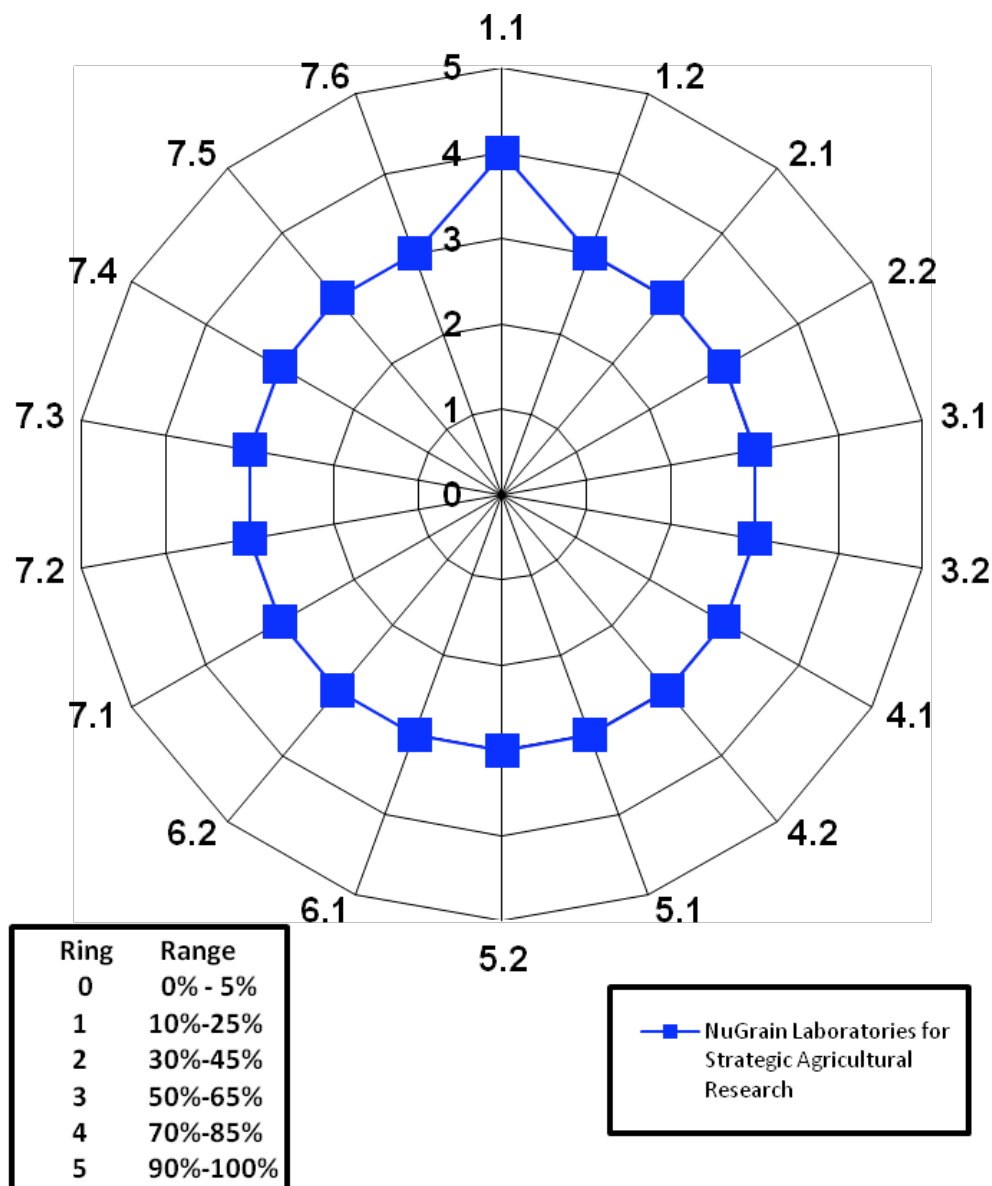
speaking engagements, support for 4-H or Future Farmers of America, participation in local science fairs, and education (e.g., tutoring or research projects). In addition, the results provided in Figure 7.6-9 are not segmented by NuGrain's four local communities. Measuring and monitoring segments of community service may assist NuGrain with determining if the voluntarism/community benefit provided is in alignment with the organizational value of respecting the land and the people who use it, as well as NuGrain's principal success factor of support for communities adjacent to research facilities.

- Results are not provided for several of NuGrain's approaches related to ethics. For example, although results for Ethical Behavior (Figure 7.6-4) include data on breaches of ethical behavior, attendance at ethics training, and signing of the Codes of Conduct, results are not provided for some of the identified approaches for building an ethical culture. For example, results are not reported for leaders' efforts to model and require ethical behavior, the discussions of ethical concerns at Hoedown Sessions, or the interactive webcasts for the workforce and partners that focus on ethical issues. Tracking results in these areas may enhance NuGrain's ability to maintain its value of demonstrating integrity.
- Comparative data are not provided for several leadership outcomes. For example, no comparisons are provided for measures of fiscal accountability (Figure 7.6-2), regulatory and legal findings (Figure 7.6-3), or ethical behavior (Figure 7.6-4). Additionally, although NuGrain exceeded its peer in total volunteer hours (Figure 7.6-9) from fiscal year (FY) 2007 to FY2009, it is unclear if the peer comparison is to a similar-sized organization. Without effective comparisons to competitors, comparable organizations, and/or benchmarks, NuGrain may not recognize opportunities to improve in these areas of leadership and societal responsibility.

APPENDIX A

The spider, or radar, chart that follows depicts your organization's performance as represented by scores for each Item. This performance is presented in contrast to the median scores for all 2010 applicants. You will note that each ring of the chart corresponds to a scoring range, as indicated in the key below the chart.

Each point in blue represents the scoring range your organization achieved for the corresponding Item. The points in red represent the median scoring ranges for all 2010 applicants. Seeing where your performance is similar or dissimilar to the median of all applicants may help you initially determine or prioritize areas for improvement efforts and strengths to leverage.



APPENDIX B

By submitting a Baldrige application, you have differentiated yourself from most U.S. organizations. The Board of Examiners has evaluated your application for the Malcolm Baldrige National Quality Award. Strict confidentiality is observed at all times and in every aspect of the application review and feedback.

This feedback report contains the Examiners' findings, including a summary of the key themes of the evaluation, a detailed listing of strengths and opportunities for improvement, and scoring information. Background information on the examination process is provided below.

APPLICATION REVIEW

Independent Review

Following receipt of the Award applications, the Award process review cycle (shown in Figure 1) begins with Independent Review, in which members of the Board of Examiners are assigned to each of the applications. Examiners are assigned based on their areas of expertise and with attention to avoiding potential conflicts of interest. Each application is evaluated independently by the Examiners, who write observations relating to the Scoring System described beginning on page 66 of the *2009–2010 Criteria for Performance Excellence*.

Award Process Review Cycle

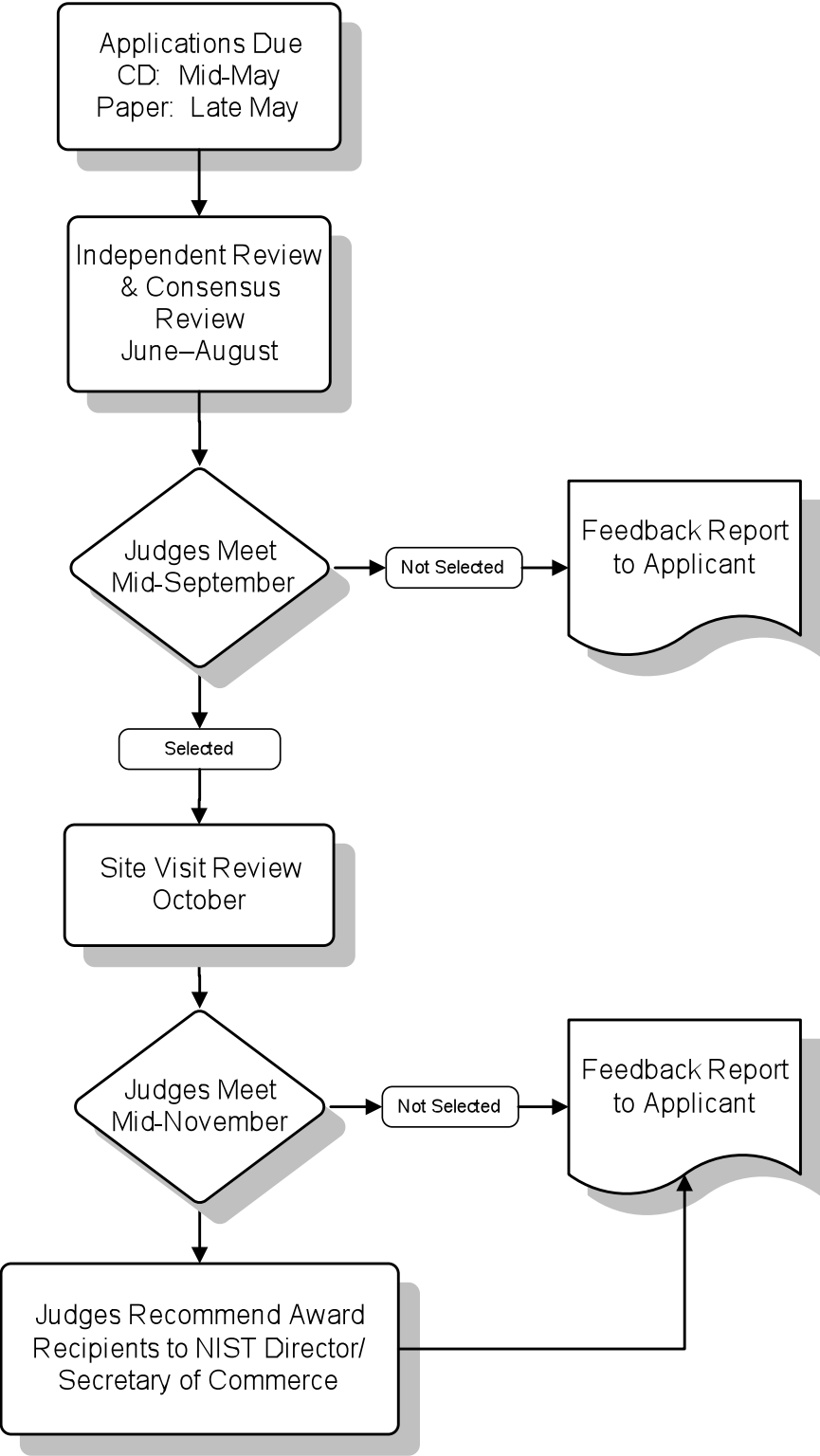


Figure 1—Award Process Review Cycle

Consensus Review

In Consensus Review (see Figure 2), a team of Examiners, led by a Senior Examiner, conducts a series of reviews, first managed virtually through a secure Web site and eventually concluded through a focused conference call. The purpose of this series of reviews is for the team to reach consensus on comments and scores that capture the team’s collective view of the applicant’s strengths and opportunities for improvement. The team documents its comments and scores in a Consensus Scorebook.

Step 1 Consensus Planning	Step 2 Virtual Consensus	Step 3 Consensus Call	Step 4 Post-Consensus Call Activities
<ul style="list-style-type: none"> • Clarify the timeline for the team to complete its work. • Assign Category/Item discussion leaders. • Discuss key business/organization factors. 	<ul style="list-style-type: none"> • Review all Independent Review evaluations—draft consensus comments and propose scores. • Post Consensus Review Worksheets for the team to review. • Address feedback, incorporate inputs, and propose a resolution of differences on each worksheet. • Review updated comments and scores. 	<ul style="list-style-type: none"> • Discuss a limited number of issues related to specific comments or scores, and discuss all key themes. • Achieve consensus on comments and scores. 	<ul style="list-style-type: none"> • Revise comments and scores to reflect consensus decisions. • Prepare final Consensus Scorebook. • Prepare feedback report.

Figure 2—Consensus Review

Site Visit Review

After Consensus Review, the Panel of Judges selects applicants to receive site visits based on the scoring profiles. If an applicant is not selected for Site Visit Review, one of the Examiners on the consensus team edits the final Consensus Scorebook, which becomes the feedback report.

Site visits are conducted for the highest-scoring applicants to clarify any uncertainty or confusion the Examiners may have regarding the written application and to verify that the information in

the application is correct (see Figure 3 for the Site Visit Review process). After the site visit, the team of Examiners prepares a final Site Visit Scorebook.

Step 1 Team Preparation	Step 2 Site Visit	Step 3 Post-Site Visit Activities
<ul style="list-style-type: none"> • Review consensus findings. • Develop site visit issues. • Plan site visit. 	<ul style="list-style-type: none"> • Make/receive presentations. • Conduct interviews. • Record observations. • Review records. 	<ul style="list-style-type: none"> • Resolve issues. • Summarize findings. • Finalize comments. • Prepare final Site Visit Scorebook. • Prepare feedback report.

Figure 3—Site Visit Review

Applications, Consensus Scorebooks, and Site Visit Scorebooks for all applicants receiving site visits are forwarded to the Panel of Judges for review (see Figure 4). The Judges recommend which applicants should receive the Award. The Judges discuss applications in each of the six Award categories separately, and then they vote to keep or eliminate each applicant. Next, the Judges decide whether each of the top applicants should be recommended as an Award recipient based on an “absolute” standard: the overall excellence of the applicant and the appropriateness of the applicant as a national role model. The process is repeated for each Award category.

Step 1 Panel of Judges’ Review	Step 2 Evaluation by Category	Step 3 Assessment of Top Organizations
<ul style="list-style-type: none"> • Applications • Consensus Scorebooks • Site Visit Scorebooks 	<ul style="list-style-type: none"> • Manufacturing • Service • Small business • Education • Health care • Nonprofit 	<ul style="list-style-type: none"> • Overall strengths/opportunities for improvement • Appropriateness as national model of performance excellence

Figure 4—Judges’ Review

Judges do not participate in discussions or vote on applications from organizations in which they have a competing or conflicting interest or in which they have a private or special interest, such as an employment or a client relationship, a financial interest, or a personal or family relationship. All conflicts are reviewed and discussed so that Judges are aware of their own and others’ limitations on access to information and participation in discussions and voting.

Following the Judges’ review and recommendation of Award recipients, the Site Visit Team Leader edits the final Site Visit Scorebook, which becomes the feedback report.

SCORING

The scoring system used to score each Item is designed to differentiate the applicants in the various stages of review and to facilitate feedback. As seen in the Scoring Guidelines (Figures 5a and 5b), the scoring of responses to Criteria Items is based on two evaluation dimensions: Process and Results. The four factors used to evaluate process (Categories 1–6) are Approach (A), Deployment (D), Learning (L), and Integration (I), and the four factors used to evaluate results (Items 7.1–7.6) are Levels (Le), Trends (T), Comparisons (C), and Integration (I).

In the feedback report, the applicant receives a percentage range score for each Item. The range is based on the Scoring Guidelines, which describe the characteristics typically associated with specific percentage ranges.

As shown in Figures 6a and 6b, the applicant's overall scores for Process Items and Results Items each fall into one of eight scoring bands. Each band score has a corresponding descriptor of attributes associated with that band. Figures 6a and 6b provide information on the percentage of applicants scoring in each band at Consensus Review.

SCORE	PROCESS (For Use with Categories 1–6)
0% or 5%	<ul style="list-style-type: none"> ▪ No systematic approach to Item requirements is evident; information is anecdotal. (A) ▪ Little or no deployment of any systematic approach is evident. (D) ▪ An improvement orientation is not evident; improvement is achieved through reacting to problems. (L) ▪ No organizational alignment is evident; individual areas or work units operate independently. (I)
10%, 15%, 20%, or 25%	<ul style="list-style-type: none"> ▪ The beginning of a systematic approach to the basic requirements of the Item is evident. (A) ▪ The approach is in the early stages of deployment in most areas or work units, inhibiting progress in achieving the basic requirements of the Item. (D) ▪ Early stages of a transition from reacting to problems to a general improvement orientation are evident. (L) ▪ The approach is aligned with other areas or work units largely through joint problem solving. (I)
30%, 35%, 40%, or 45%	<ul style="list-style-type: none"> ▪ An effective, systematic approach, responsive to the basic requirements of the Item, is evident. (A) ▪ The approach is deployed, although some areas or work units are in early stages of deployment. (D) ▪ The beginning of a systematic approach to evaluation and improvement of key processes is evident. (L) ▪ The approach is in the early stages of alignment with your basic organizational needs identified in response to the Organizational Profile and other Process Items. (I)
50%, 55%, 60%, or 65%	<ul style="list-style-type: none"> ▪ An effective, systematic approach, responsive to the overall requirements of the Item, is evident. (A) ▪ The approach is well deployed, although deployment may vary in some areas or work units. (D) ▪ A fact-based, systematic evaluation and improvement process and some organizational learning, including innovation, are in place for improving the efficiency and effectiveness of key processes. (L) ▪ The approach is aligned with your organizational needs identified in response to the Organizational Profile and other Process Items. (I)
70%, 75%, 80%, or 85%	<ul style="list-style-type: none"> ▪ An effective, systematic approach, responsive to the multiple requirements of the Item, is evident. (A) ▪ The approach is well deployed, with no significant gaps. (D) ▪ Fact-based, systematic evaluation and improvement and organizational learning, including innovation, are key management tools; there is clear evidence of refinement as a result of organizational-level analysis and sharing. (L) ▪ The approach is integrated with your organizational needs identified in response to the Organizational Profile and other Process Items. (I)
90%, 95%, or 100%	<ul style="list-style-type: none"> ▪ An effective, systematic approach, fully responsive to the multiple requirements of the Item, is evident. (A) ▪ The approach is fully deployed without significant weaknesses or gaps in any areas or work units. (D) ▪ Fact-based, systematic evaluation and improvement and organizational learning through innovation are key organization-wide tools; refinement and innovation, backed by analysis and sharing, are evident throughout the organization. (L) ▪ The approach is well integrated with your organizational needs identified in response to the Organizational Profile and other Process Items. (I)

Figure 5a—Scoring Guidelines for Process Items in the Business/Nonprofit Criteria

SCORE	RESULTS (For Use with Category 7)
0% or 5%	<ul style="list-style-type: none"> ▪ There are no organizational performance results and/or poor results in areas reported. (Le) ▪ Trend data either are not reported or show mainly adverse trends. (T) ▪ Comparative information is not reported. (C) ▪ Results are not reported for any areas of importance to the accomplishment of your organization’s mission. No performance projections are reported. (I)
10%, 15%, 20%, or 25%	<ul style="list-style-type: none"> ▪ A few organizational performance results are reported, and early good performance levels are evident in a few areas. (Le) ▪ Some trend data are reported, with some adverse trends evident. (T) ▪ Little or no comparative information is reported. (C) ▪ Results are reported for a few areas of importance to the accomplishment of your organization’s mission. Limited or no performance projections are reported. (I)
30%, 35%, 40%, or 45%	<ul style="list-style-type: none"> ▪ Good organizational performance levels are reported for some areas of importance to the Item requirements. (Le) ▪ Some trend data are reported, and a majority of the trends presented are beneficial. (T) ▪ Early stages of obtaining comparative information are evident. (C) ▪ Results are reported for many areas of importance to the accomplishment of your organization’s mission. Limited performance projections are reported. (I)
50%, 55%, 60%, or 65%	<ul style="list-style-type: none"> ▪ Good organizational performance levels are reported for most areas of importance to the Item requirements. (Le) ▪ Beneficial trends are evident in areas of importance to the accomplishment of your organization’s mission. (T) ▪ Some current performance levels have been evaluated against relevant comparisons and/or benchmarks and show areas of good relative performance. (C) ▪ Organizational performance results are reported for most key customer, market, and process requirements. Performance projections for some high-priority results are reported. (I)
70%, 75%, 80%, or 85%	<ul style="list-style-type: none"> ▪ Good to excellent organizational performance levels are reported for most areas of importance to the Item requirements. (Le) ▪ Beneficial trends have been sustained over time in most areas of importance to the accomplishment of your organization’s mission. (T) ▪ Many to most trends and current performance levels have been evaluated against relevant comparisons and/or benchmarks and show areas of leadership and very good relative performance. (C) ▪ Organizational performance results are reported for most key customer, market, process, and action plan requirements, and they include some projections of your future performance. (I)
90%, 95%, or 100%	<ul style="list-style-type: none"> ▪ Excellent organizational performance levels are reported for most areas of importance to the Item requirements. (Le) ▪ Beneficial trends have been sustained over time in all areas of importance to the accomplishment of your organization’s mission. (T) ▪ Evidence of industry and benchmark leadership is demonstrated in many areas. (C) ▪ Organizational performance results fully address key customer, market, process, and action plan requirements, and they include projections of your future performance. (I)

Figure 5b—Scoring Guidelines for Results Items in the Business/Nonprofit Criteria

Band Score	Band Number	% Applicants in Band ¹	PROCESS Scoring Band Descriptors
0–150	1	0	The organization demonstrates early stages of developing and implementing approaches to the basic Criteria requirements, with deployment lagging and inhibiting progress. Improvement efforts are a combination of problem solving and an early general improvement orientation.
151–200	2	0	The organization demonstrates effective, systematic approaches responsive to the basic requirements of the Criteria, but some areas or work units are in the early stages of deployment. The organization has developed a general improvement orientation that is forward-looking.
201–260	3	0	The organization demonstrates effective, systematic approaches responsive to the basic requirements of most Criteria Items, although there are still areas or work units in the early stages of deployment. Key processes are beginning to be systematically evaluated and improved.
261–320	4	0	The organization demonstrates effective, systematic approaches responsive to the overall requirements of the Criteria, but deployment may vary in some areas or work units. Key processes benefit from fact-based evaluation and improvement, and approaches are being aligned with organizational needs.
321–370	5	0	The organization demonstrates effective, systematic, well-deployed approaches responsive to the overall requirements of most Criteria Items. The organization demonstrates a fact-based, systematic evaluation and improvement process and organizational learning, including innovation, that result in improving the effectiveness and efficiency of key processes.
371–430	6	0	The organization demonstrates refined approaches responsive to the multiple requirements of the Criteria. These approaches are characterized by the use of key measures, good deployment, and evidence of innovation in most areas. Organizational learning, including innovation and sharing of best practices, is a key management tool, and integration of approaches with organizational needs is evident.
431–480	7	0	The organization demonstrates refined approaches responsive to the multiple requirements of the Criteria Items. It also demonstrates innovation, excellent deployment, and good to excellent use of measures in most areas. Good to excellent integration is evident, with organizational analysis, learning through innovation, and sharing of best practices as key management strategies.
481–550	8	0	The organization demonstrates outstanding approaches focused on innovation. Approaches are fully deployed and demonstrate excellent, sustained use of measures. There is excellent integration of approaches with organizational needs. Organizational analysis, learning through innovation, and sharing of best practices are pervasive.

¹ Percentages are based on scores from the Consensus Review.

Figure 6a—Process Scoring Band Descriptors

Band Score	Band Number	% Applicants in Band ¹	RESULTS Scoring Band Descriptors
0–125	1	0	Results are reported for a few areas of importance to the accomplishment of the organization’s mission, but they generally lack trend and comparative data. Limited or no performance projections are reported.
126–170	2	0	Results are reported for several areas of importance to the Criteria requirements and the accomplishment of the organization’s mission. Some of these results demonstrate good performance levels. The use of comparative and trend data is in the early stages. Limited performance projections are reported.
171–210	3	0	Results address many areas of importance to the accomplishment of the organization’s mission, with good performance being achieved. Comparative and trend data are available for some of these important results areas, and some beneficial trends are evident. Limited performance projections are reported.
211–255	4	0	Results address some key customer/stakeholder, market, and process requirements, and they demonstrate good relative performance against relevant comparisons. There are no patterns of adverse trends or poor performance in areas of importance to the Criteria requirements and the accomplishment of the organization’s mission. Limited performance projections are reported, including those for a few high-priority areas.
256–300	5	0	Results address most key customer/stakeholder, market, and process requirements, and they demonstrate areas of strength against relevant comparisons and/or benchmarks. Improvement trends and/or good performance are reported for most areas of importance to the Criteria requirements and the accomplishment of the organization’s mission. Performance projections for some high-priority areas are reported.
301–345	6	0	Results address most key customer/stakeholder, market, and process requirements, as well as many action plan requirements, and some results include projections of future performance. Results demonstrate beneficial trends in most areas of importance to the Criteria requirements and the accomplishment of the organization’s mission, and the organization is an industry ² leader in some results areas.
346–390	7	0	Results address most key customer/stakeholder, market, process, and action plan requirements and include projections of future performance. Results demonstrate excellent organizational performance levels and some industry ² leadership. Results demonstrate sustained beneficial trends in most areas of importance to the Criteria requirements and the accomplishment of the organization’s mission.
391–450	8	0	Results fully address key customer/stakeholder, market, process, and action plan requirements and include projections of future performance. Results demonstrate excellent organizational performance levels, as well as national and world leadership. Results demonstrate sustained beneficial trends in all areas of importance to the Criteria requirements and the accomplishment of the organization’s mission.

¹ Percentages are based on scores from the Consensus Review.

² “Industry” refers to other organizations performing substantially the same functions, thereby facilitating direct comparisons.

Figure 6b—Results Scoring Band Descriptors

Baldrige National Quality Program

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