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## **ISO 9001:2000 and the Baldrige Criteria for Performance Excellence - A Comparison**

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# **ISO 9001:2000 and the Baldrige Criteria for Performance Excellence - A Comparison**

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## **Abstract**

The Sandia National Laboratories Nuclear Weapons Strategic Management Unit (NWSMU) is pursuing performance excellence, by focusing on compliance with the ISO 9001:2000 standard for quality management systems. The NWSMU also intends to achieve ISO Certification and eventually reach levels of performance excellence that are consistent with those of Malcolm Baldrige National Quality Award winners. In that context, this report documents a study undertaken to answer these questions:

- Would achieving ISO 9001:2000 compliance or certification help an organization prepare to achieve Baldrige-level performance excellence?
- Would pursuing Baldrige-based performance excellence help an organization achieve ISO certification?
- What are the areas where the Baldrige and ISO systems are most closely aligned?

The study produced answers to those questions, as well as a number of comparisons and contrasts between the ISO standard and the Baldrige criteria.

## **Acknowledgments**

The study reported herein was prompted by the interest of Les E. Shephard, Sandia National Laboratories, in the synergies between efforts to satisfy the ISO 9001-2000 standard and similar efforts to meet the Baldrige Criteria for Performance Excellence.

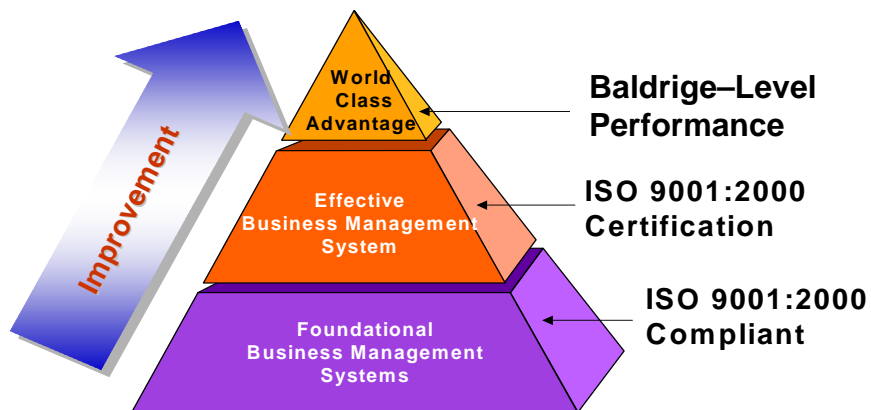
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## Introduction

### Purpose of the Study

Over the last 10 years, Sandia National Laboratories has used the Baldrige Criteria for Performance Excellence for periodic self-assessment and improvement. In 1995 and again in 1998, Sandia applied for the New Mexico Quality Award at the Zia level. In both years, Sandia received Roadrunner recognition and took some action on the opportunities for improvement that were included in our feedback report. Additionally, several organizations within Sandia have individually gained certification to ISO standard 9001:2000, for their quality management systems. In 2002, Sandia's Nuclear Weapons Strategic Management Unit (NWSMU) (consisting of approximately 60% of Sandia employees and budget) began a journey toward "performance excellence" that focuses on self-assessments against ISO 9001:2000. The NWSMU also intends to achieve ISO compliance and certification and eventually reach levels of performance excellence that are consistent with those of Baldrige Award winners. The intended progress in organizational performance using ISO and Baldrige is depicted in Figure 1, below. (Note – Throughout this report, the abbreviation "ISO" refers specifically to the ISO 9001:2000 standard, and "Baldrige" refers to the Baldrige Criteria for Performance Excellence.)



**Figure 1.** Business Improvement Scale.

Because of Sandia's involvement with both Baldrige and ISO, this study sought answers to three questions:

- 1) Would achieving ISO 9001:2000 compliance or certification help an organization prepare to achieve Baldrige-level performance excellence?
- 2) Would pursuing Baldrige-based performance excellence help an organization achieve ISO certification?

3) What are the areas where the Baldrige and ISO systems are most closely aligned?

In the process of determining the answers to those questions, particularly question 3), we developed a number of comparisons and contrasts between the two documents, which are also reported.

### **Summary of Conclusions**

First it should be stated that, as would be expected, no conflicts or contradictions were identified between the requirements of the ISO standard and the Baldrige criteria. In other words, neither pursuit of ISO 9001 certification nor adoption of approaches consistent with the Baldrige criteria would inherently cause an organization to be unable to meet any of the requirements or criteria of the other document. In general, the two documents drive complementary and supportive approaches, policies, and practices, and both systems share the objective of organizational and process improvement.

It should also be noted that both ISO and Baldrige can enable an organization to improve its performance and market success. The primary differences are in purpose and methods of review or certification. The Baldrige criteria can be used to guide an organization toward performance improvement, as well as in preparing a written application for the Malcolm Baldrige National Quality Award. By comparison, ISO 9001 is a standard against which an organization's quality management system is compared for certification purposes, and certification is determined and maintained through periodic on-site assessments by an independent party.

**Answer to question 1** - Would achieving ISO 9001:2000 compliance or certification help an organization prepare to achieve Baldrige-level performance excellence?: Yes, especially in the area of Process Management (Baldrige Category 6). That is, an ISO assessment would provide the most usable feedback regarding the criteria in Baldrige Category 6 (see Figure 5).

**Answer to question 2** - Would pursuing Baldrige-based performance excellence help an organization achieve ISO certification?: Very little; a complete Baldrige assessment would require a large effort for little return with regard to ISO certification. Even a self-assessment that focused on Baldrige Category 6 would be of marginal value with regard to ISO compliance because the Baldrige criteria questions are broader and more general than the ISO requirement statements.

**Answer to question 3** - What are the areas where the Baldrige and ISO systems are most closely aligned?: The strongest alignment exists between Baldrige Category 6 (Process Management) and ISO Clauses 4 through 8. Conversely, the Baldrige criteria are most strongly represented in ISO Clauses 7 and 8 (Product Realization and Measurement/Analysis/Improvement).

## Comparison Methodology

International Standard ISO 9001, “Quality management systems – Requirements,” is promulgated by the International Organization for Standardization, a worldwide federation of national standards bodies. The standard specifies requirements for a quality management system that will enable an organization to consistently provide products or services that meet customer or regulatory requirements and to enhance customer satisfaction. An organization’s adherence to the standard should build confidence among its customers that its products or services will consistently conform to customer or regulatory requirements.

The Baldrige *Criteria for Performance Excellence* are a set of non-binding criteria published each year by the Baldrige National Quality Program Office within the U. S. Department of Commerce. While they are the basis for awarding the Malcolm Baldrige National Quality Award, they also serve as a tool for understanding and managing organizational performance; improving practices, capabilities, and business results; and for performing organizational self-assessments.

To address the three questions posed above, the specific requirements of ISO 9001-2000 and the specific criteria of the Baldrige National Quality Program were compared in a structured manner. In particular, only the content of ISO 9001 was compared with the Baldrige award criteria; we did not expand the comparison to include guidance or elaborative information related to either the ISO standard or the Baldrige criteria. (Such guidance or elaborative information is available in ISO 9004 and in many of the sections of the Baldrige *Criteria for Performance Excellence* publication other than the section that specifies the criteria.) This approach was taken because the requirements of ISO 9001, alone, and the Baldrige criteria, alone, are the bases for certification or the award, respectively. Organizations will tend to focus on the content of those specific documents as the bases of their quality systems.

Specifically, the individual sub-clauses of the ISO standard were compared against the areas to address in the Baldrige criteria or their component, parenthetically-numbered question sets. (ISO “sub-clauses” are defined as the most specific requirement statements in the ISO standard within clauses 4 through 8 that are headed by a section number, as illustrated in Figure 2. In the Baldrige criteria, an “area to address” is a detailed criterion. Some areas to address consist of one or more criteria questions that are not further subdivided; other areas to address are broken into parenthetically-numbered sets of questions [e.g., 2.1.b(1) and 2.1.b(2)]. Figure 3 shows the Baldrige hierarchy of Categories, items, and areas to address, using example topical headers from that document.)

Topical headers excerpted from ISO 9001, illustrating clauses and sub-clauses, are shown below:

<b>4 Quality Management System</b>	[ISO 9001 <u>Clause</u> ]
...	
<b>4.2 Documentation Requirements</b>	
<b>4.2.1 General</b>	[ISO 9001 <u>Sub-clause</u> ]

**Figure 2.** Identification of Clauses and Sub-clauses in ISO 9001

Topical headers excerpted from the Baldrige Criteria for Performance Excellence, illustrating categories, items, and areas to address, are shown here:

<b>5 Human Resource Focus</b>	[Baldrige <u>Category</u> ]
<b>5.1 Work Systems</b>	[Baldrige <u>Item</u> ]
a. Organization and Management of Work	[Baldrige <u>Area to address</u> ]

**Figure 3.** Identification of Categories, Items, and Areas to address in the Baldrige Criteria

In performing these comparisons of the most specific, identifiable requirements and criteria (the “elements”), the relationship between the elements was characterized to be either well-aligned, somewhat aligned, or showing no correlation to one another. While these characterizations are to some extent subjective, the degree of subjectivity was reduced in two ways. First, the existence of some degree of alignment (or, conversely, lack of alignment) between elements is fairly apparent. The great majority of elements, compared pair-wise, have no relationship to one another; they are simply about different topics. Those pairs were characterized as having no correlation. Of the remaining elements, a number were clearly very similar, in part or as a whole. Those elements were characterized as being well-aligned. Among the remainder, most were found to be somewhat aligned, with the rest falling in the “no correlation” group. Second, a two-person check-and-balance approach was used. For any set of elements, the characterization was initially developed by one of the authors, then evaluated separately by the other author; any points of initial disagreement about the extent of alignment between elements was resolved by discussion between the authors. The degree of alignment between individual pairs of elements in the two documents was recorded in the form of a two-dimensional matrix with the Baldrige elements along one axis and the ISO elements along the other. Each resulting cell of the matrix was color-coded to indicate the degree of alignment, if any, between individual elements of the two documents.

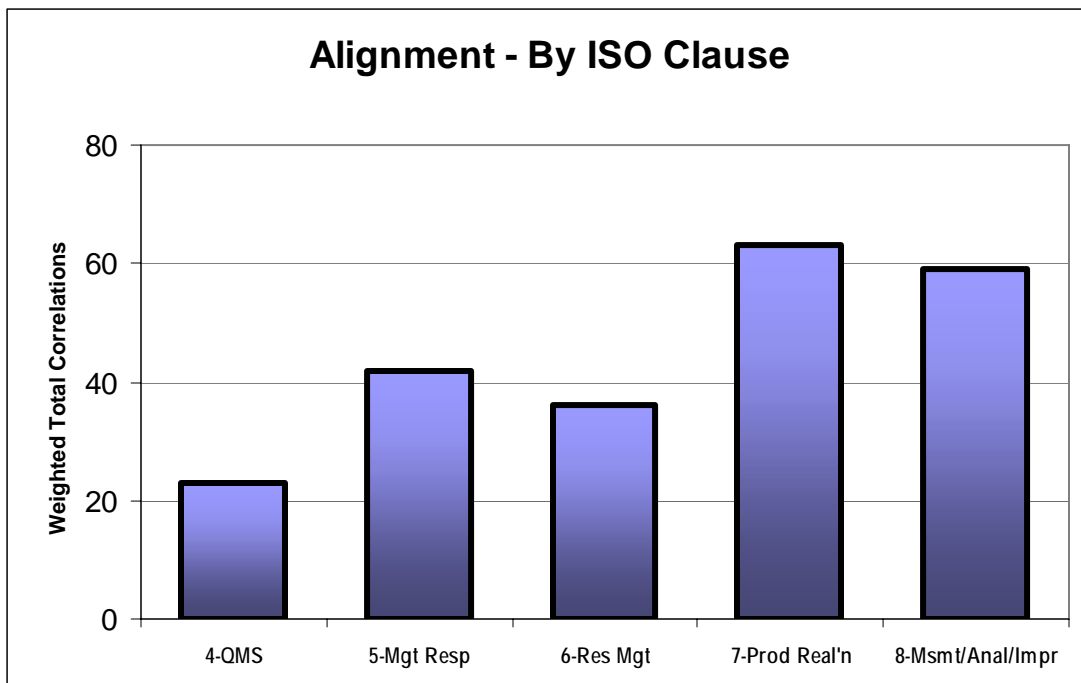


Once the matrix indicating relationship/alignment of individual elements was completed, it was manipulated in two ways. First, weighting values were assigned to each cell: 3 for elements that are well aligned with one another, 1 for elements that are somewhat aligned, and zero for elements having no correlation. Those weighting values were then summed by sub-clause or clause (for the ISO standard) and by area, item, and category (for the Baldrige criteria), thereby indicating which of those document subdivisions is most strongly aligned with the other document. Bar charts in Figures 4 and 5, below, show the results of this analysis, indicating a quantitative relationship between, respectively, the Baldrige criteria with the individual ISO requirement clauses and the ISO standard with the individual categories of the Baldrige criteria.

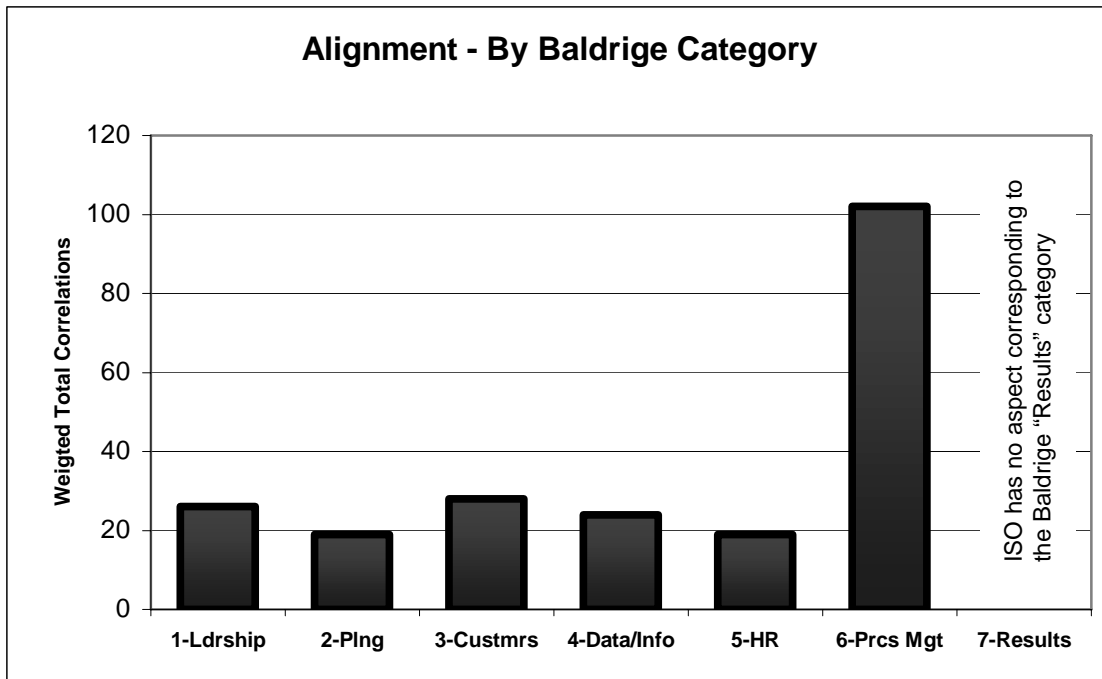
Second, the element relationships were combined to produce comparisons at reduced levels of detail. The matrices in the following section (Figures 6 and 7) show those comparisons at the ISO-clause to Baldrige-category level and the ISO-sub-clause to Baldrige-item level.

### Bases for Conclusions and Additional Detail

The bar charts below provide views of the alignment between Baldrige and ISO. Both views support the conclusion that the strongest alignment is between Baldrige Category 6 (Process Management) and ISO Clauses 7 and 8 (Product Realization and Measurement/Analysis/Improvement). See a discussion that follows of the similarities and differences identified between the two management system frameworks.



**Figure 4.** Alignment of Individual ISO 9001 Clauses with the Baldrige Criteria.





**Figure 5.** Alignment of Individual Baldrige Categories with ISO 9001.

Bldrg⇒ ISO↓	1	2	3	4	5	6	7
4	Some alignment	Some alignment	Blank	Some alignment	Blank	Good alignment	Blank
5	Good alignment	Some alignment	§	Good alignment	Blank	Some alignment	Blank
6	Blank	Blank	Blank	Blank	Good alignment	Good alignment	Blank
7	Blank	Blank	Good alignment	Blank	Blank	Good alignment	Blank
8	Some alignment	§	Good alignment	Good alignment	Blank	Good alignment	§

**Legend:**  
 Good alignment  
 Some alignment  
 Blank indicates very little or no alignment  
 § indicates somewhat less alignment than for the other similarly color-coded cells

**Figure 6.** General Degree of Alignment between Baldrige Categories and ISO 9001 Clauses.

Bldrg⇒ ISO↓	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	6.1	6.2	7.1	7.2	7.3	7.4	7.5	7.6
4.1	Some		Some	Some			Some	Some				Good	Good						
4.2	Some		Some				Some	Some											
5.1	Good	Good	Some																
5.2					Good														
5.3	Some																		
5.4			Some	Good															
5.5	Some						Good	Good											
5.6	Good											Some	Some						
6.1									Some										
6.2									Good	Good								#	
6.3												Good	Some						
6.4												Good	Some						
7.1												Good	Some						
7.2		Some			Good	Good						Some							
7.3				Some								Good							
7.4												Some	Some						
7.5												Good			#				
7.6								Some				Good							
8.1							Good					Good	Good						
8.2.1						Good								#					
8.2.2	Some																		#
8.2.3				Some			Good					Some	Some						
8.2.4				Some			Some					Some	Some						
8.3												Some							
8.4												Some	Some	#	#				#
8.5												Good	Good	#	#		#	#	
8.5.2/3												Some							

Legend:  
 Good alignment  
 Some alignment  
Blank indicates very little or no alignment  
# indicates that the availability and use of results/data of the type identified by the Baldrige item are implied in the associated ISO sub-clause

**Figure 7.** Degree of Alignment between Baldrige Items and ISO 9001 Sub-clauses.

Other important aspects that grow out of a comparison of the two systems:

### **Similarities –**

- First, it should be said that there are generally more similarities than differences between ISO 9001 and Baldrige. They are aligned with generally similar objectives for the organizations that employ them, and we could find no areas where implementation of requirements from one document would conflict with implementation of actions that are responsive to criteria in the other document. Additionally, systems based on either document will tend to ensure that organizations identify and meet their customers' requirements and expectations.
- Additionally, both the ISO 9001 requirements and the Baldrige criteria are accompanied by a significant amount of elaborative and guidance information that can help the users of the documents understand the underlying concepts, integrate their implementation, and move beyond basic compliance. This guidance is provided in portions of the Baldrige *Criteria for Performance Excellence* booklet other than the specific criteria enumeration, such as the Core Values, Concepts, and Framework; Category and Item Descriptions; and Criteria Response Guidelines. For the ISO 9000 system, such guidance appears in ISO 9004:2000, "Quality management systems – Guidelines for performance improvements".
- Very strong alignment is seen between Baldrige Category 6 (Process Management) and the requirements portion (clauses 4 through 8) of ISO 9001. Conversely, aspects of ISO 9001 clauses 7 and 8 (Product Realization and Measurement/Analysis/Improvement, respectively) are reflected throughout the Baldrige criteria.. Areas of strong overlap include product, service, and support process design, delivery, measurement, and continuous improvement. Although approaches to supply chain management differ, both documents address this subject as well.
- Systems based on either document will involve internal, self-assessments against the criteria or requirements, a key component of a culture of continual improvement.
- Finally, both documents specify their requirements or state their criteria in terms of what should be achieved or what conditions should be established, without dictating how to do so, leaving detailed implementation to the using organization.

### **Differences –**

- Several of the observable differences in the two systems arise from the fact that they exist for different purposes. The Baldrige criteria are primarily intended to guide an organization in preparing a written application to be considered for the Malcolm Baldrige National Quality Award, while ISO 9001 is a standard against which an organization's quality management system is assessed for certification purposes. These differences create some notable contrasts.
- One of the most apparent differences between the two documents, arising from their differing purposes (and related evaluation processes), can be seen in the Baldrige category calling for results to be enumerated and reported in a specific portion of an award application. ISO has

no comparable content, but does not need such a stand-alone requirement for reporting results. Because applications for the Baldrige award are evaluated, at least initially, by examiners who do not visit the applicant's location, there is a need for qualitative and quantitative results from the applicant's business system to be included in their application. However, since ISO conformance is evaluated by assessors who visit an organization's location to directly observe the functioning of the organization's quality system, levels and trends in metrics (results) used to monitor the organization's performance can be observed in real time. Therefore, no separate, written enumeration of those outcomes is needed for ISO. So, even though this distinct difference exists (as illustrated in Figure 5 by the lack of correlation of Baldrige Category 7 with ISO 9001), there is no real significance to this difference.

- Another difference arises from the differing purposes of the two documents and can be seen in the style of the two documents. The Baldrige criteria, being criteria for an award, are phrased in the form of questions to be considered and answered. ISO 9001, as a certification standard, states specific requirements to be met, thereby aligning more strongly with other requirements-based, conformance-oriented systems such as Department of Energy Order 414.1A and ANSI/ASME NQA-1.
- Baldrige is a broader system, addressing performance excellence across the organization for business success. ISO, in turn, is focused on a system that reliably produces products or services that meet customer-expectation-based requirements applicable to those products or services. The underlying purpose of ISO 9001 is to give customers of ISO-certified businesses a high degree of confidence that the products or services provided by those business will meet the customers' expectations. Therefore, ISO is more specific and stronger than Baldrige in the process management areas, particularly concerning the value-creation processes of design, production, and product/service delivery, with relatively less focus on, for example, strategic planning processes and employee well-being. This is reflected in the strong alignment shown (in Figure 5, above) between ISO and Baldrige Category 6, Process Management, and the distinctly lower degree of alignment between ISO and the other Baldrige categories. A concise way to characterize this comparison is that ISO 9001 is very customer-focused, ensuring that products and services reliably meet customer requirements, while Baldrige is more internally focused, tending to ensure that the using organization is successful.
- Individual, topical contrasts between Baldrige and ISO include the following:
  - In ISO 9001, the role of senior leaders in crafting, implementing, and supporting the quality management system is clearly established, but ISO has few other leadership-specific criteria. Baldrige calls for leadership actions in directing all of an organization's systems, including setting its vision, values, and objectives, developing strategic plans, and supporting an ethos of social responsibility.
  - Regarding customer knowledge and satisfaction, ISO focuses very strongly on knowing customer requirements for the product/service, with clear focus on achieving customer satisfaction. Baldrige also stresses knowledge of customer requirements and is concerned with a wider range of customer satisfaction information, including means for customer access to the organization, complaint management, and

- segmentation of customer information for analysis, as well as with customer relationship development. Additionally, Baldrige addresses using information about both competitors and comparable organizations.
- Regarding management use of information and data, ISO emphasizes the quality assurance functions of process monitoring, verification of product/service characteristics, and tracking customer satisfaction, plus use of data for improvement. Baldrige addresses those uses of data, and includes criteria about ensuring the integrity, accuracy, and availability of data, as well as the capture, consolidation, and dissemination of organizational knowledge.
  - In the area of Human Resources, ISO is concerned with adequacy of employee competency in their work functions; Baldrige is concerned with that plus future development of employees and their well-being and satisfaction, as well as the organization and management of work systems in general.
- Although it is not apparent from the content of ISO 9001 and the Baldrige criteria, a notable difference between the two documents appears in the respective processes by which organizations' quality systems are evaluated and the sustainability of the resulting quality management systems.
    - Both processes involve internal, self-assessments against the criteria or requirements; the Baldrige evaluation then includes a critical review of the descriptive content of a written award application by a group of independent examiners, while ISO certification involves an in-depth on-site audit of an organization's quality management system.
    - The education, experience, and training required of Baldrige examiners and ISO assessors, while demanding and rigorous in both cases, differ in detail.
    - The Baldrige award process includes a site visit for a few award finalists each year; every organization that seeks ISO certification experiences an on-site audit conducted by rigorously accredited auditors.
    - Additionally, ISO certification evaluation is periodically and systematically repeated over time for maintenance of certification; a Baldrige award evaluation is a one-time event.

As a result, the gains achieved in pursuing ISO certification are inherently more sustainable than those for a Baldrige application, unless the organization is highly disciplined in maintaining their quality system.

Table 1, below, summarizes the similarities and differences described above.

**Table 1. Summary Comparison of ISO 9001-2000 and the Baldrige Criteria for Performance Excellence.**

<b>Characteristic or Area of Comparison</b>	<b>ISO 9001</b>	<b>Baldrige</b>
Effective as precursor for ISO certification?	N/A	Not very effective
Effective as precursor for Baldrige levels of performance?	Yes	N/A
Explanatory, elaborative information beyond basic document	ISO 9004:2000, “Quality management systems – Guidelines for performance improvements”	Other portions of the Baldrige <i>Criteria</i> booklet
Internal self-assessment	Required	Implicit, for application preparation
Basic purpose	A standard for certification	A guide for preparation of an award application
Objective	Increased customer confidence in your product/service	Organizational/business performance excellence
Style	Specifies requirements to be met	Poses questions to be considered and answered
Type of external evaluation	On-site audit by qualified assessors	Evaluation of a written application by selected, trained examiners
On-site evaluation	For every organization, repeated semi-annually	For a very few award candidates, once
Role of organization leaders	Focused on establishing and supporting the quality mgmt. system	Emphasizes directing and leading all aspects of the organization
Customer focus	Strongly oriented on meeting customer requirements and on customer satisfaction	Similar orientation on knowledge of cust. req'm'ts, cust. relationship mgmt., analysis of cust. information
Use of data and information	For production monitoring, product characteristics verification, customer satisfaction, supplier performance	The ISO uses, plus business results, org. effectiveness results, and management of “org. knowledge”
Human resource focus	Employee competency	Employee competency, development, and well-being
Sustainability of performance excellence	Implicit, due to semi-annual assessments	No inherent mechanism
Most appropriate level of application	Either at corporate level or at lower levels	Corporate level or major-operating-element level

## Summary

The requirements of ISO 9001-2000 and the criteria of the Baldrige National Quality Program are generally consistent and not contradictory. The Baldrige criteria for performance excellence are best applied in a corporate context, being oriented on overall business success. The ISO quality management system requirements, with their emphasis on ensuring that products or services meet applicable requirements, can reasonably be applied at organization levels where the design, production, and delivery of those products or services occurs. The ISO system of periodic reassessments by an independent party makes a quality management system based on ISO 9001 inherently more sustainable than a Baldrige-based system.

A Baldrige-based assessment would provide only limited value as a mechanism for moving toward attainment of ISO 9001-2000 compliance or certification.

Attaining ISO compliance and then certification would, however, be of help in attaining Baldrige-criteria levels of organizational performance excellence, across all the approach/deployment-oriented Baldrige categories, particularly in the value-creation processes of design, production, and delivery of products or services (Baldrige Category 6). That is, the concept of building on a foundation of ISO compliance and attainment of ISO certification as a way to move toward Baldrige levels of performance excellence is sound.

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