

Business Health Reporting Process At Bruce Power Helps Drive Successful Plant Performance

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Abstract

Developing and implementing consistent and comprehensive measures of performance on a large multi-reactor unit nuclear power plant site is a significant challenge. Linking these performance measures back to licence compliance standards and all aspects of the operations, engineering, maintenance and support activities is needed to ensure cohesive site-wide safe operations and satisfy regulatory needs. At Bruce Power, Canada's largest independently-owned nuclear power producer, a Business Health reporting process has been developed to provide a standardized performance rating scheme. The reporting process ties all self assessment activities to common management principles and process structure areas that comprise the Bruce Power Management System. The principles used for performance ratings link directly back to the operating licenses and the primary referenced management system standard. The Business Health reporting process provides a natural business and regulatory oversight framework report that is easily understood and consistently measured over time. The rating data is derived from easily understood quantitative and qualitative descriptions that can be trended over time. The results derived from semi-annual Business Health reports provide an ongoing overall measure of Bruce Power's management system effectiveness for enabling and sustaining required business results and high standards of safety.

1. Introduction

Developing and implementing consistent and comprehensive measures of performance on a large multi-reactor unit nuclear power plant site is a significant challenge. Performance measures should be easily understood, quantitative, measured consistently over time and not duplicate other high level indicators [1]. These indicators should link to regulatory requirements, management expectations/objectives, relevant operating experience and provide for corrective action interventions if targets are not met or if adverse trends develop.

At Bruce Power, Canada's largest independently-owned nuclear power producer, a Business Health reporting process has been developed and is now in use to provide a standardized performance rating scheme. This system development coincided with the development of the first edition of Canadian Standards Association (CSA) N286-05, *Management system requirements for nuclear power plants*[2], a licensing level document. The rating system incorporates specific key aspects of this standard.

The results derived from semi-annual Business Health reports provide an ongoing overall measure of Bruce Power's management system effectiveness for enabling and sustaining required business results and high standards of safety.

2. Standards Development

The Bruce Power Operating Licence issued by the Canadian Nuclear Safety Commission (CNSC) contains a reference to the CSA N286 series of standards. These standards contain management requirements pertaining to the assurance of standards for activities throughout the life cycle phases of a nuclear power plant. In the late 1990s it was recognized that many of the same management requirements apply to each phase, and that site evaluation, design, purchasing, construction, installation, commissioning, operating and decommissioning activities may occur during any of the life cycle phases [2]. This led to work by Canadian nuclear utility representatives together with the regulator (the CNSC) to revise the CSA N286 series of standards to produce a single standard that would place proper emphasis on management system requirements, its primary purpose.

2.1 Management system principles

As a result, CSA N286-05 was created and issued in February 2005. This standard promotes safe and reliable operation of nuclear power plants while focusing on management's role in controlling and managing work processes. A set of 14 management system principles is a key part of the standard. Bruce Power has taken these management system principles and augmented them by adding an additional overarching principle, "Work must be planned, implemented and controlled". These 15 management system principles (refer to Table 1) now form the basis of Bruce Power's Business Health Evaluation & Reporting (BHER) process.

- MP 1 Work must be planned, implemented and controlled.
- MP 2 The required business results must be defined.
- MP 3 The organization must be defined and understood.
- MP 4 Changes must be controlled.
- MP 5 The preparation and distribution of documents/software must be controlled.
- MP 6 Adequate resources must be available.
- MP 7 Personnel must be competent at the work they do.
- MP 8 Personnel must know what is expected of them.
- MP 9 Information must be provided in time to the personnel who need it.
- MP 10 The performance of work must be controlled.
- MP 11 Records must be maintained.
- MP 12 Experience must be shared, sought and used.
- MP 13 Work must be verified to confirm that it is correct.
- MP 14 Problems must be identified and resolved.
- MP 15 Assessments must be performed.

Table 1 Management System Principles

2.2 The Business Health Evaluation & Reporting Process

The Business Health Evaluation & Reporting (BHER) process is used by Bruce Power to conduct semi-annual management performance effectiveness self-assessments. These comprehensive reviews evaluate the effectiveness of business processes that collectively enable the delivery of Bruce Power's key outcome results. The scope of the evaluation involves all facets of Bruce Power, and the assessment provides a self-critical and fact-based examination of people, plant and process performance. Emergent sub-standard events or adverse conditions result in the initiation of actions through the corrective action and/or business direction planning processes. The results of the evaluations are documented in the semi-annual Business Health Report.

2.3 Process Structure

The Bruce Power business process structure currently consists of 12 Level 1 processes (Policies), 41 Level 2 processes (Programs) and numerous subordinate level processes (Procedures) (refer to Figure 1). These inter-linked processes embrace all the core business and business improvement activities performed by the company. There are also 7 Management Oversight Area (MOA) programs that define specific performance requirements related to critical areas of the business warranting additional managerial oversight. They describe how specific requirements are being satisfied through the performance of activities associated with the 41 established Level 2 business processes.

Bruce Power

BUSINESS HEALTH REPORT CARD

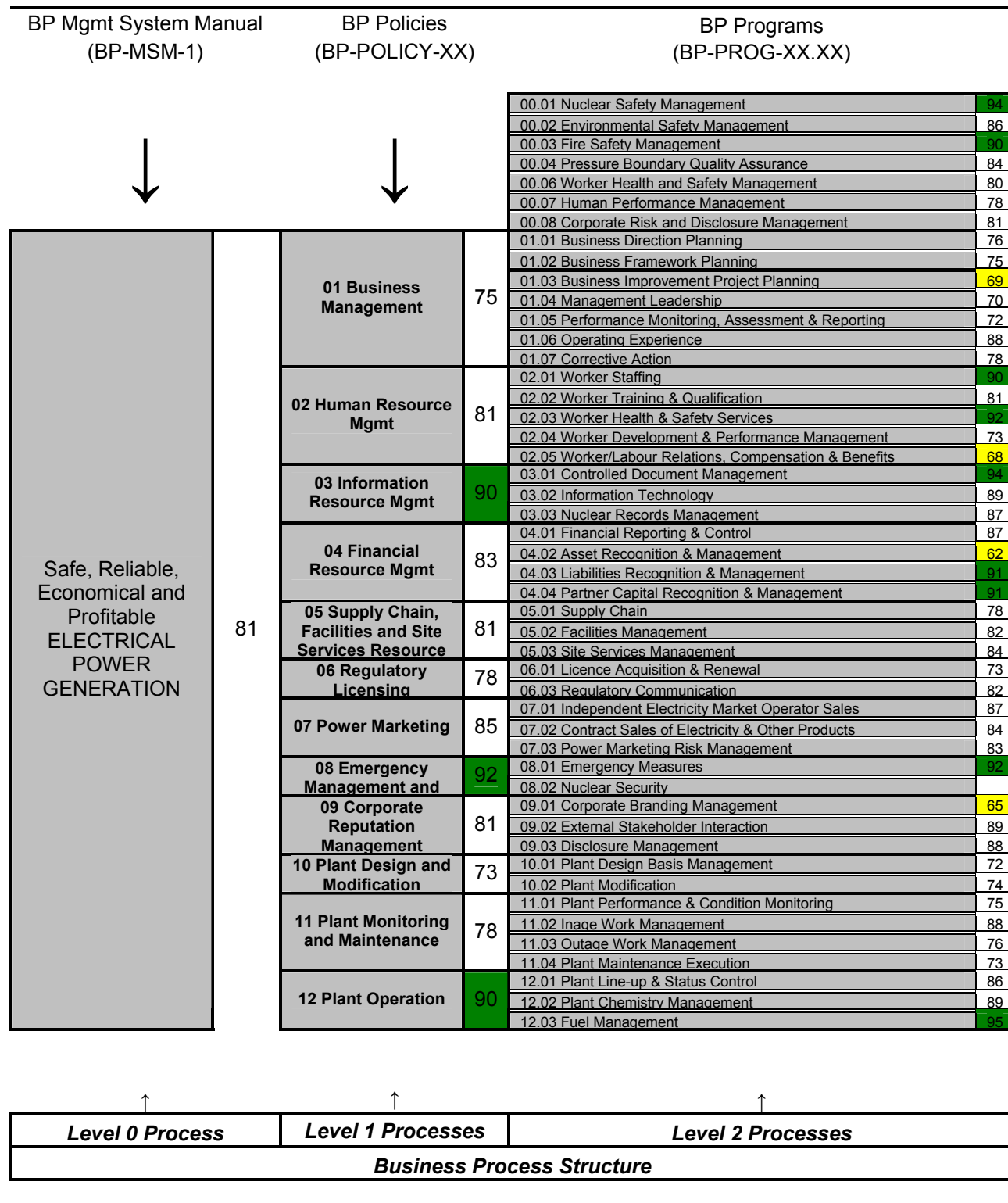


Figure 1 Business Health Process Structure – A Business Health Report (not real data)

2.4 Program Area Evaluation

Semi-annual measurement and evaluation of these 48 programs areas provides a comprehensive and ongoing picture of the overall health of the business. Program area owners lead evaluations and gather inputs from the program stakeholders including the internal audit department. The evaluations are structured to align with and are rated against the 15 management system principles (refer to Figure 2). These principles link directly back to the licensing level standard, CSA N286 (refer to Table 1).

General performance rating criteria (refer to figure 3) and management system principle specific performance rating criteria are used consistently for all evaluations. This provides for a reasonable degree of rating consistency across all program areas and is a system that is easily understood by the evaluators. Integrated with program evaluation is the input from the internal audit department that uses the same management system principle rating scheme and performance rating criteria for each associated completed internal audit.

An overall program evaluation summary is produced for each of the 48 programs. It contains the following data:

- Overall Actual Rating vs. Year End Target Rating (the Actual Rating number is a roll up average of the performance rating against each Management System Principle as planned, implemented and controlled by the program)
- Overall Program Evaluation Summary (a description highlighting overall program rating, rating changes and rationale, as well as strengths and any weaknesses or threats)
- Overall Corrective Action Summary (a description highlighting key business improvements that are planned along with key milestones and targets)
- Overall Enhancement Opportunities (a description of actions needed to raise or improve existing standards)

The rating results are input into a shared Business Health Report (BHR) database.

MP	Description	Individual Principle Rating	Overall Actual Rating	Year End Target Rating
MP 1	Work must be planned, implemented and controlled.	0	0	
Plan				
MP 2	The required business results must be defined.	0		
MP 3	The organization must be defined and understood.	0		
MP 4	Changes must be controlled.	0		
MP 5	The preparation and distribution of documents/software must be controlled.	0		
Implement				
MP 6	Adequate resources must be available	0		
MP 7	Personnel must be competent at the work they do.	0		
MP 8	Personnel must know what is expected of them.	0		
MP 9	Information must be provided in time to the personnel who need it.	0		

Figure 2 Example of a BHR Program Rating Database Screen

Rating Popup : Form

Rating Criteria	
Green (90-100)	Strength Performance is exemplary and exceeds requirements and expectations. No issues exist and no improvement initiatives are required. A green rating should be reflective of external/internal independent assessments that acknowledge performance as demonstrating best industry practices/ strengths. This may be in evidence by external organizations benchmarking against these identified strengths. Risk associated with continued performance is Negligible.
White (70-89)	Satisfactory Performance is satisfactory and meets requirements and expectations. One or more minor issues exist, but improvement initiatives are underway. Any issues of substandard performance are being addressed by corrective action plans. There may be enhancement opportunities identified or underway to raise/improve current standards of performance. Risk associated with continued performance is Low.
Yellow (50-69)	Weakness Performance is marginal and doesn't meet requirements and expectations. One or more weaknesses exist and improvement initiatives are either in place or still required. Detailed corrective action is required. Risk associated with continued performance is Medium.
Red (0-49)	Significant Weakness Performance is inadequate and well below requirements and expectations. One or more significant weaknesses exist and immediate improvement initiatives are required. Risk associated with continued performance is High.

Record: 1 of 1

Start Busin... Inbox... Addr... Mana... Micro... Hutte... Busin... Busin... Mic... 11:48 AM

Figure 3 General performance rating criteria

2.5 Policy Area Evaluations

Policy area owners, typically Executive Vice Presidents constructively challenge the program evaluations and ensure that adequate corrective actions are initiated or are progressing based on the significance of management system performance gaps identified. The results of these reviews are recorded in a written Policy Area Executive Summary (refer to Figure 4) and include the following information:

- The overall policy rating, rating changes and rationale, along with any policy area strengths or weaknesses/threats (significant ongoing or emergent sub-standard events, adverse conditions, performance trends or behaviours associated with part or all of the policy).
- The key Business Improvement project(s) or initiative(s) underway to correct or improve significant existing sub-standard events, adverse conditions, performance trends or behaviours, along with key actions/milestones/targets and status.
- Any present, proposed, suggested or recommended actions associated with enhancement opportunities for raising, increasing or otherwise improving existing standards of performance or behaviour.

The rating number assigned to each policy area is an average of the associated program area evaluations. The policy area evaluation results are input into a shared Business Health Report (BHR) database.

Microsoft Access - [Exec Sum Input : Form]

File Edit View Insert Format Records Tools Window Help

Policy Area Executive Summary Input

Instructions Close Form

Policy: [] Quarter: 1 Year: 2004 Rating: []

Executive Summary

Program Summary(s)

Instruct2 frm : Form

1. Select the Policy Area and enter the desired Year and Quarter. If the Executive Summary field is blank, then no prior entry exists for the specified Year and Quarter.

2. Prepare the Executive Summary. The relevant Program Summaries are provided as an aid. If any of these are blank or missing, then the Program Area Eval'n Summary input has not been completed yet for the specified Year and Quarter.

Record: 1 of 1

Form View

Start Busi... Inb... Add... Ma... Micr... Hutt... Busi... Busi... Mi...

3:33 PM

Figure 4 Example of a BHR Database Policy Area Executive Summary Review Input Screen

2.6 Overall Business Health Rating Results

The Overall Business Health Rating number is determined by averaging the ratings of all of the policy areas. The Policy Area Executive Summaries are used to produce, prepare and input a company level overview summary. Its content reflects similar information to the policy area summaries, but from a company-wide perspective. It provides a description of overall management system effectiveness and improvement initiatives needed to enable and sustain required business and safety results.

2.7 Trending of Results

Performance rating trends are produced for each management system principle, program area, policy area and the overall company. These trends are included in the semi-annual BHR.

2.8 Business Health Evaluation Meeting and Report

A Business Health Evaluation Meeting (BHEM) is conducted for the purpose of allowing program and policy owners the opportunity to present their evaluation/review results in a forum that promotes constructive challenging by peers. Program and policy area ratings presented in the BHR must be consistent with the general performance rating criteria. The policy/program area ratings indicate the ability of established business processes or management oversight areas to achieve and sustain expected performance results. The overall Bruce Power rating, a roll up of Policy ratings is a measure of the effectiveness of the Bruce Power Management System to enable and sustain delivery of required business outcome results due to the collective performance and behaviours associated with the enabling business processes. Trends are reviewed to provide early indications of improving or degrading performance in either business process structure areas or management system principle areas.

A final semi-annual BHR is issued and distributed to the management team. It is expected that the results are shared with staff so they can see how their individual activities impact the results.

3. Conclusion

Bruce Power has developed a consistent and comprehensive measure of performance for its large multi-reactor unit nuclear power plant site. The use of the Business Health Evaluation and Reporting process to tie all self assessment activities to common management system principles provides a direct link back to the operating license and a primary referenced management system standard. The Business Health Report provides a natural business and regulatory oversight framework document that is easily understood and gives results that can be trended over time. The results derived from the quarterly Business Health Report provide an ongoing overall measure of the effectiveness of Bruce Power's management system needed to enable and sustain business and safety results, helping to drive successful plant performance.

4. References

- [1] Nuclear Power Production Committee Energy and Environmental Division American Society for Quality, *Recommendations for the implementation of selected leading indicators of performance at nuclear power production plants*, EED-99-01, Revision 0, August 1999, 17 pages.
- [2] CSA Standard N286-05, *Management system requirements for nuclear power plants*, February 2005, 32 pages.