



EVALUATION OF GOAL-ORIENTED REGULATION

Prepared for:

NATIONAL ENERGY BOARD OF CANADA

Prepared by:

MATRIX SOLUTIONS INC.

John C. Banks, P.Chem.
Senior Environmental Chemist

reviewed by
Leo W. Bouckhout, M.Sc., P.Biol.
Vice President, International

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Calgary ♦ Edmonton ♦ Grande Prairie ♦ Fort St. John ♦ Pincher Creek ♦ Abu Dhabi

230, 319 - 2 Avenue S.W.
Calgary, Alberta, Canada T2P 0C5

Phone: (403) 237-0606, Fax: (403) 263-2493
www.matrix-solutions.com

EXECUTIVE SUMMARY

The National Energy Board (NEB) has developed and pursued a new regulatory approach termed “Goal-Oriented Regulation” (GOR), initially implementing this approach through the Onshore Pipeline Regulations in 1999 (OPR-99). This represents a move from a purely prescriptive regulation towards a more performance-based system. Under GOR, regulated companies are given more flexibility to achieve regulatory compliance goals aimed at improving pipeline safety and environmental protection.

In 2004, as part of its continuous improvement efforts, the NEB retained Matrix Solutions Inc. to conduct an evaluation of various aspects of GOR and its implementation. Issues and gaps were identified as part of this evaluation by conducting interviews with selected NEB, industry and stakeholder representatives. Focus group meetings were also held with NEB staff.

All interviewed groups identified prevention as the principal mechanism for achieving the common goal of reducing risks. GOR has been a positive initiative in meeting the goal of advancing pipeline safety, the protection of property and environmental protection. The GOR approach provides industry the flexibility to apply its knowledge and experience to address specific operating conditions, and provides the NEB with reasonable assurance of compliance.

Over the course of thirty-nine interviews, two focus group discussions and informal discussions, issues and gaps were identified and recommendations have been presented to improve the GOR approach and processes. Areas of concern centered primarily on compliance auditing, but also included enforcement, interaction with other regulatory agencies, indicators and application processing.

The GOR approach is a valid one, and its introduction through OPR-99 has been successful. There is room for improvement as there is not yet a shared understanding among, and sometimes within, the NEB, regulated companies and other stakeholders about the concept and reality of GOR. Although there is a need for consistent minimum standards (through prescriptive regulations), GOR provides a mechanism to encourage innovation and performance beyond the minimum. The NEB should continue to refine GOR and seek additional applications where GOR represents the most effective approach to regulation.

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The NEB was represented by Mr. Albert Fung (Manager of Audit and Evaluation) and other members of the NEB Advisory Committee: Gaétan Caron (Board Member), Sandy Harrison (Business Leader Applications), Alan Murray (Professional Leader Engineering), Ken Paulson (Team Leader, Operations Compliance) and Karen Blank (Environmental Specialist).

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1.0 INTRODUCTION

The National Energy Board (NEB) is charged with the responsibility of regulating the construction and operation of inter-provincial and international pipelines. With respect to pipeline safety and the protection of property and the environment, the NEB has adopted a new regulatory approach termed “Goal-Oriented Regulation” (GOR). Implementation of this new approach began in 1999 with the introduction of the *Onshore Pipeline Regulations 1999* (OPR-99). The NEB has since broadened its application of this regulatory approach with additional initiatives, including the introduction of the *Processing Plant Regulations* in 2003 and the distribution of the draft *Damage Prevention Regulations* in 2004.

Adoption of GOR represents a move from purely prescriptive regulations towards more performance-based regulations that focus on desired end results. Selection of specific methods and programs by companies to achieve regulatory compliance is somewhat discretionary under GOR; however, some prescriptive elements remain. After five years of experience with GOR, the NEB determined that 2004 would be an appropriate time to evaluate the results of this regulatory style before moving forward with further initiatives. The NEB’s Audit and Evaluation Committee initiated this comprehensive evaluation to review the experience and opinions of internal and external groups on particular aspects of GOR, to identify any weaknesses and gaps as well as measures to improve the GOR approach. The evaluation has been conducted by Matrix Solutions Inc. (Matrix). This report presents the results of that independent assessment.

2.0 EVALUATION OBJECTIVES

This assignment was intended to meet three broad objectives:

1. to assess the effectiveness of the NEB’s current goal-oriented approach in regulating pipeline safety and environmental protection;
2. to identify gaps in the current goal-oriented regulatory approach; and
3. to develop specific actions for addressing the identified gaps and improving the performance of this method of regulation.



To elaborate on these objectives, nine focal questions provided by the NEB guided the evaluation design and its implementation:

1. Are the purpose and requirements of GOR well understood by regulated pipelines, landowners and other stakeholders?
2. What has been the impact of GOR on NEB-regulated pipelines, affected landowners and other stakeholders?
3. Does GOR promote due diligence, industry responsibility and industry accountability (as compared to the former prescriptive regulatory regime)? In particular, what are the management programs that pipeline companies have put in place to respond to the requirements of GOR?
4. How far have pipeline companies come in assessing their own compliance as required by OPR-99?
5. From the perspectives of regulated companies and the NEB, is the pipeline audit process (as currently implemented by the NEB) effective in verifying compliance with GOR?
6. How effective has the Board been in leading industry toward, and adapting to, GOR?
7. Under GOR, in what ways have pipeline companies changed the way they apply for facilities?
8. Are there indications that pipeline facilities are safer and the environment better protected since GOR came into effect? If not, what will be the early signs that we are gradually achieving the desired end results?
9. Does GOR provide incentives to the pipeline industry for innovation and creativity with respect to how it will meet the stated purpose of this new mode of regulation?

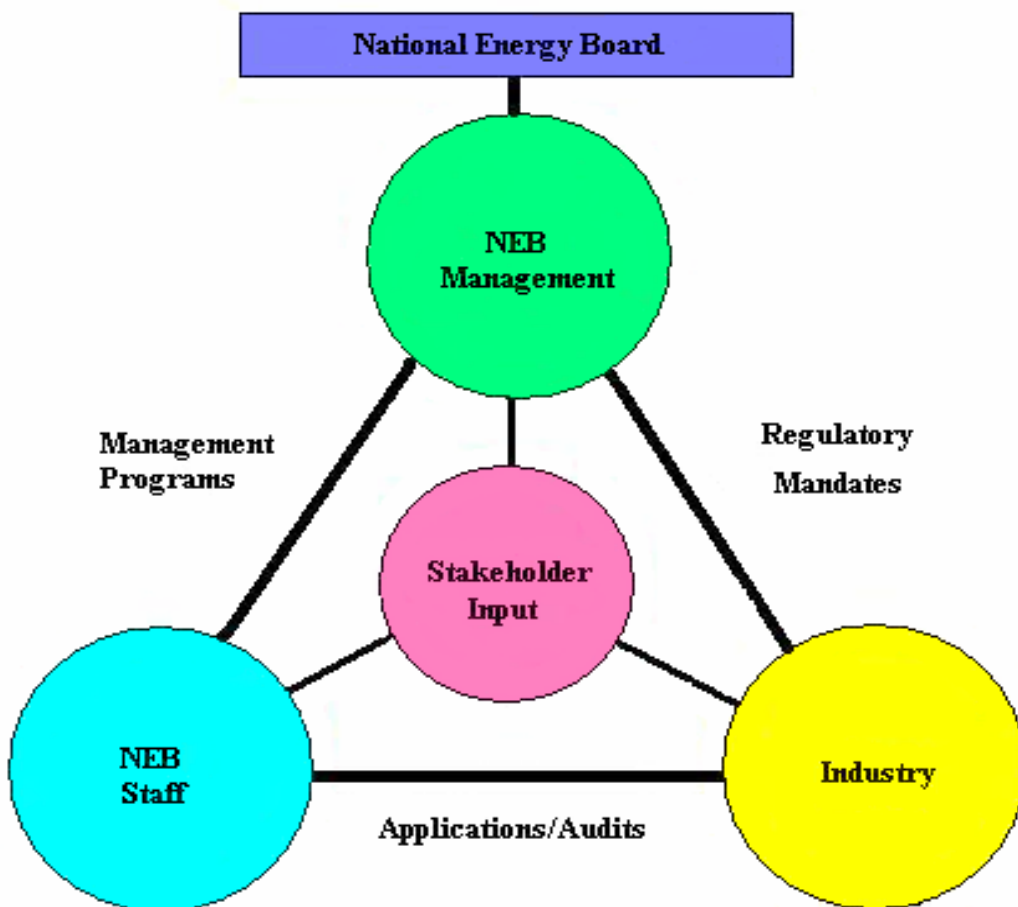
3.0 EVALUATION APPROACH AND METHODOLOGY

The strategy for evaluating GOR incorporated the soliciting of opinion through interviews with the aid of questionnaires developed to address the nine focal questions. Four important groups were identified by Matrix, in consultation with the NEB. These were NEB management, NEB staff, NEB regulated pipeline companies (industry) and various stakeholders. The questionnaires were used by the interviewers as a guide to facilitate discussion. Interview questionnaires were not generally provided to participants in advance and were not left after

completion of the interviews. Interviewees were invited to forward additional thoughts and opinions to Matrix after interviews were completed.

In evaluating GOR, the relationships among the four groups were considered in developing appropriate questions. These relationships have been illustrated in Figure 1.

Figure 1: Interview Target Group Relationships



Identification of appropriate interviewees was carried out in consultation with the NEB in order to ensure that the evaluation was as comprehensive as reasonably possible. A list of companies and organizations interviewed is presented in Appendix 1. To preserve confidentiality, the names of the specific individuals interviewed have not been listed.

An effort was made to avoid personal opinions. Rather, corporate or group perspectives were sought. Company and group representatives participating in the evaluation interviews and

focus group discussions were identified by the target company's/group's senior level representatives. Letters of introduction inviting participation of selected company/group representatives were sent by the NEB. Along with the desire for geographic representation of Canada's pipeline industry, selection criteria for participants included the following:

Industry

- All Group I NEB-regulated companies; and
- A representative number of Group II regulated companies (including some which had been audited by the NEB for OPR-99 compliance and some that had not).

NEB Management and Staff

- A representative number of staff and management who have the opportunity to impact procedures and processes;
- Staff who had been with the Board prior to 1999 when OPR-99 was introduced;
- Adequate representation of business units and teams; and
- Staff that interact directly with industry and those involved in company audits.

Stakeholders

- Individuals, groups and organizations that represent landowner and other special interests;
- Interest groups that interact with pipeline companies;
- Interest groups that represent pipeline companies and other industry participants; and
- Regulatory agencies involved in pipeline safety and environmental protection in other jurisdictions.

Important aspects of the evaluation process included the following:

- There was a feedback mechanism by which questionnaires, interviewee selection and assessment approaches could be refined.
- Selection of interviewees involved consultation with the NEB.
- The process allowed for follow-up contact with interviewees for clarification or to obtain further information.
- Initial findings from interviews were tested against the project objectives.

- Conclusions and recommendations were refined and tested for appropriateness to project objectives and scope.

Further elaboration of the approach and methodology, and a flow chart outlining the evaluation process, are provided in Appendix 2.

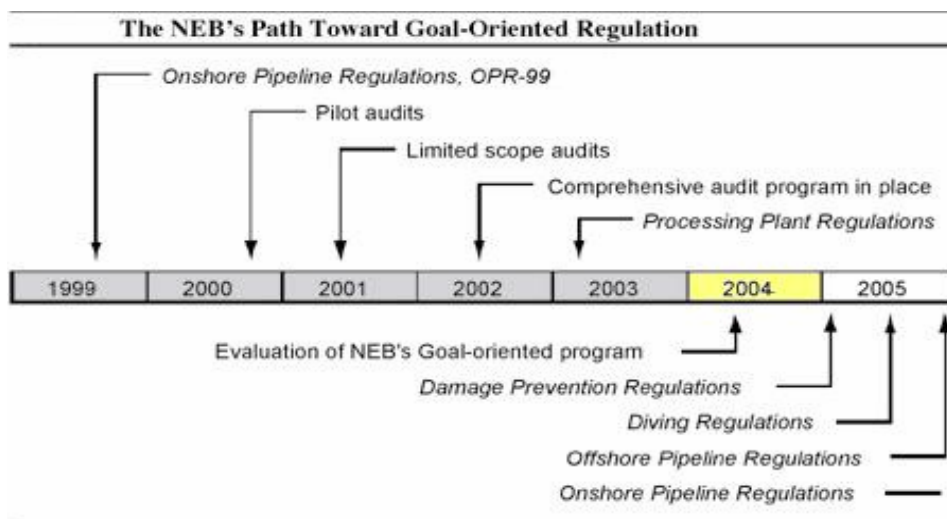
4.0 EVOLUTION OF GOAL-ORIENTED REGULATION AT THE NEB

As a result of the complexity of Canada's pipeline systems and the vast differences in terrain and environment across Canada, it would be an arduous task to address all safety and environmental risk scenarios with a set of specific or prescribed regulations. As well, due to rapid advances in technology, fully prescriptive regulations may not be suitable for introducing the best available technology aimed at continuous improvement of pipeline safety and environmental protection. The NEB has attempted to address these challenges with the introduction of goal oriented regulations – regulations which contain a mix of prescriptive and goal based requirements.¹

The shift from a prescriptive regulation of the pipeline industry in Canada towards a goal-oriented regulation is well documented. A thorough review is provided in the paper by the NEB Chairman, Kenneth W. Vollman, entitled "*Towards Goal-Oriented Regulation*", presented at the International Pipeline Conference in October 2000. Figure 2 (taken from a 2003 speech presented by Kenneth W. Vollman, Board Chairman) illustrates the timeline associated with the NEB's move toward implementation of GOR.

¹ K. Paulson, "Goal Based Regulation of Pipelines in Canada", National Energy Board, 2004.

Figure 2: The NEB's Path toward Goal-Oriented Regulation



In May 1994, the NEB began a consultation process regarding the *National Energy Board Onshore Pipeline Regulations*. The regulation of safety and environmental protection worldwide changed dramatically in the 1990s, in part because of recommendations resulting from inquiries into major accidents like the Piper Alpha disaster in the UK offshore. The NEB requested comments from approximately 1,800 individuals and organizations on revising its regulations. During this period, the Board also conducted an inquiry on stress corrosion cracking on Canadian oil and gas pipelines. Based on the trends in regulation worldwide and the perspectives provided by stakeholders, the NEB decided to modify its Onshore Pipeline Regulations (OPR) to a goal-oriented model.

A consultative process with industry and stakeholders was undertaken to amend the OPR. The draft regulation was sent to all companies under NEB jurisdiction. The NEB also provided further clarification at the request of the Canadian Energy Pipeline Association (CEPA) on September 9, 1997. On April 8, 1998 the Draft OPR was submitted to the Department of Justice and was pre-published on September 28, 1998. A mail-out of the proposed OPR was sent to companies and stakeholders on January 18, 1999. The new regulations, known as OPR-99, came into force in August 1999.

The intention of this new direction in regulation was to reinforce the fact that the primary responsibility for pipeline safety and environmental protection rests with the companies, not the regulator. OPR-99 requires companies to develop appropriate approaches to ensure that required end results set out in the regulations would be met. The NEB did not abandon all prescriptive requirements, such as requiring adherence to relevant Canadian Standards Association (CSA) standards.

In 1998 the NEB undertook the development of regulations to establish minimum requirements specific for safety and environmental protection for processing plants under its jurisdiction. The resulting *National Energy Board Processing Plant Regulations* (PPR) are intended to further advance goal-oriented regulation. The process of consultation with industry and the presentation of the PPR to industry and stakeholders were consistent with that used during the development of OPR-99. The PPR and OPR-99 have elements of both prescriptive and goal-based (performance-based) requirements. This combination of prescriptive and performance-based approaches requires that the regulations be supplemented by non-mandatory guidance notes or advice.

The NEB is currently revising its *Pipeline Crossings Regulations*, Parts I and II, to produce a single proposed *National Energy Board Damage Prevention Regulations* (DPR). Comments and feedback have been received from a large number of stakeholders and the final draft of the regulations is expected to be submitted to the Department of Justice later this year. The DPR reflect the NEB's continued advancement of the goal-oriented approach to pipeline regulation. These regulations are unique in that, in addition to conducting audits to ensure compliance, the NEB proposes to issue fines for serious non-compliance. Consideration is also being given to publishing the details of the issued fines.

On April 29, 2004, the Board released the Filing Manual, replacing its earlier *Guidelines for Filing Requirements* to give direction to companies preparing applications for consideration by the Board. Again, industry and stakeholders, including other regulatory agencies and aboriginal groups, were invited to participate in the review process for the document. As part of the Filing Manual introduction, the NEB offered a two-month window for training to assist document users. This extensive document is intended to assist applicants to clearly understand the level of detail and specific information required as part of an application. Pre-Application Meeting Guidance Notes are referenced in the document and are available on the NEB website.



From the above referenced regulations and accompanying guidance notes, it is apparent that the NEB has been engaged in a process to develop and implement regulatory instruments that clearly meet the goal-oriented definition - “regulations which contain a mix of prescriptive and goal based requirements”. (K. Paulson, “Goal Based Regulation of Pipelines in Canada”, NEB, 2004). In considering to what extent the Board should apply GOR to the pipeline industry, it is important to recognize that the overwhelming majority of individuals interviewed in industry and in Board management and NEB staff favoured the GOR approach. The challenge is in its application.

5.0 FINDINGS AND DISCUSSION

Thirty-nine individual interviews were conducted with selected NEB management, Groups 1 and 2 pipeline companies and stakeholders (regulatory agencies, industry organizations and First Nations organizations and other third parties). In addition, two focus group discussions were held involving fourteen NEB staff representatives.

5.1 Effectiveness of Goal-Oriented Regulations

5.1.1 Level of Understanding

Stakeholders were asked if they felt there was a general understanding within their organization of NEB’s GOR approach. In direct response to this question, and in comments made throughout the rest of the interview process, most stakeholders that communicated with NEB on an ongoing basis indicated that they feel that there is, indeed, a general understanding of GOR within their organization, at least by the members that are most affected by GOR. The representative from the U.S. Department of Transportation indicated a very good understanding; however, landowner representatives indicated they were not familiar with GOR concepts or terminologies.

Across the spectrum of stakeholders interviewed, especially other government agencies, there was agreement that GOR can be a difficult concept for many to grasp and that the understanding of it could be enhanced by further information from the NEB. It was also felt by

some stakeholder interviewees that other regulatory agencies may have a incomplete understanding of the GOR concept.

Overall, respondents from industry indicated that there was a general understanding of GOR within the industry and within their respective companies. However, this opinion was more strongly held by participants from Group 1 companies (G1) than by those from Group 2 companies (G2). The key reason cited for this difference, which was acknowledged by members of both groups, was that the flexible non-prescriptive nature of GOR required organizations to rely more extensively on in-house expertise for planning and implementation, making compliance efforts more difficult and costly than for more prescriptive approaches, particularly at the early stage of implementation.

Both G1 and G2 groups companies expressed the concern that the guidelines are subject to varied interpretations and that additional guidance notes from the NEB may be useful in addressing this concern. For the G2 interviewees, the most significant concern is the apparent added cost of compliance with GOR requirements. As with the stakeholders, industry respondents indicated that additional information from the NEB would be useful; however, they also indicated a generally high level of satisfaction with the GOR-related workshops and information sessions provided by the NEB (either through sponsorship or direct participation).

The majority of the NEB staff respondents said there was an inconsistent understanding of GOR amongst the staff (except among staff in the Operations Business Unit who have a much greater familiarity with GOR). This lack of common understanding was cited as having a potentially negative impact on interactions with industry, both in applying GOR to regulated companies and in situations where an organization may attempt to capitalize on inconsistencies (indicated by one respondent).

NEB staff respondents also stressed the need for better communication, education and training about what is involved in GOR implementation, how to apply regulations, what the staff role specifically entails and the difference between prescriptive and goal-based approaches.

NEB management respondents suggested that: “the same problem exists internally [as with the regulated companies]. Some people see [GOR] as another set of regulations while others understand the potential.” Respondents in this group reported a solid understanding of GOR, particularly amongst the executive, while noting that there is disparity in understanding at the



staff level. Similarly, respondents indicated that the NEB is making 'great strides', but some sectors are not yet 'up-to-speed'. As well, they felt that the general attitude of industry is positive. Participants from this group indicated an awareness of the difficulties with audits and regulatory change implementation that were indicated by respondents in the NEB staff, industry, and stakeholder groups. As with respondents from other groups, NEB management indicated that continued improvements in education and information sharing could address many of these issues internally.

5.1.2 Impact of GOR

Stakeholders were asked how the NEB's introduction of GOR affected their working relationships with the Board (or with Industry). Some stakeholders, especially industry representative organizations, reported improvement in their relationship with the NEB, citing increases in consultation and open discussions as the main improvements. One regulatory agency reported NEB's leadership role has caused it to consider adopting a similar goal-oriented approach. Stakeholder respondents also reported an increased awareness in the industry about GOR benefits, including the flexibility that the approach provides. In general, implementation of GOR has not significantly altered the way in which they operate.

Industry respondents provided several different examples of the impacts that their companies had experienced with the introduction of OPR-99. Most of the comments about GOR were positive, as they described how it encouraged responsible management of pipelines and a commitment to improvement that is a major focus of the audit process. These initiatives helped to raise public awareness of pipeline safety. GOR was also reported to be the driving force behind the development of some company management systems, and some industry interviewees indicated that it encouraged their companies to "move in the right direction".

The spirit of GOR is not prescriptive and, therefore, the concept has been received positively by many companies. There was enthusiastic support for the flexibility that GOR allows, even though it is also a contributor to concerns that were raised, primarily in regard to consistency and interpretation. Industry participants also reported improved relations with NEB, as well as internal benefits such as an improved focus on goals and a commitment to higher performance levels. GOR encourages companies to develop their own means to achieve regulatory compliance. Even the smaller companies have benefited to some extent, as one respondent



explained that the guidelines from the audit were helpful and that these changes were in the public interest and have raised public awareness.

GOR has initially created more work for companies as many people must be involved in the preparation of management systems and plans and in the audit process. A considerable increase in documentation requirements also contributes to increased work loads.

The majority of the NEB staff and management saw the implementation of GOR as a positive step, one that allows for flexibility in approach and implementation. They also commented on the fact that it was probably of most benefit to the large pipeline companies. It has encouraged companies to assume more responsible management approaches to regulations.

Staff members report having made considerable changes in how they determine whether companies comply with OPR-99. Respondents reported other positive impacts of GOR such as improvement in communication across business units and teams, although there were some reports that these changes may not have come about directly as a result of the implementation of GOR. Some management and staff respondents noted that GOR has resulted in an increased focus on refinement and further development of internal management systems.

5.1.3 Due Diligence

Stakeholders were asked if pipeline companies are now more diligent in regard to pipeline safety and environmental protection than in the past. Every stakeholder that responded to this question (two declined to answer as they felt they did not have sufficient information to comment) indicated that, since the implementation of GOR, pipeline companies had the same or better performance than in the past in regard to safety and environmental protection. It was also commonly noted that pipeline companies have historically been reasonably diligent. Some respondents observed that the larger companies have benefited more than smaller ones, mainly because they have the means (personnel and other resources) to achieve implementation.

In general, stakeholders and NEB respondents suggested that pipeline companies are now more diligent in striving to achieve better safety and environmental protection performance, though this was not entirely attributed to GOR. It appears to be at least in part due to increasing public and regulatory focus on safety and environmental issues.



Industry participants were asked for greater detail than other groups with regard to how companies determine compliance and about new or innovative pipeline integrity testing techniques that may have been implemented in the past five years. The majority of the responses referred to the companies' ability to be proactive. As a result of the flexibility of GOR, companies have been able to find innovative solutions and are able to manage change effectively.

Industry participants credited the NEB, and particularly the audit process, with being a significant catalyst in the adoption of GOR-based concepts within companies. Many also indicated that their companies performed internal audits and were subject to audits from other regulatory agencies. It was also noted that many of the changes that impact pipeline integrity were the result of new technologies, an increasing interest in safety and environmental issues and the public's and company's best interests.

5.1.4 Compliance

Of the 30 responses to the question, to what extent are pipeline companies compliant with OPR-99, all industry and stakeholder respondents reported they believed most companies were fully compliant. Companies suggested that compliance was met and confirmed through internal auditing, ISO programs, regulatory evaluations and by the implementation of programs that are responsive to the regulation. Several industry participants reported having had at least one external NEB audit performed and indicated that their companies have also implemented internal audits.

Stakeholder participants were asked to suggest what more could be done to ensure companies are compliant and were asked if interactions outlining emergency response programs were improving. The most common response was that enforcement processes could be improved. For example, the audit process could be improved or audits increased in number and other forms of monitoring or inspections could be increased. There was also general agreement that more or better-defined guidelines might help ensure that all companies have a clear understanding of GOR requirements.

Some stakeholder participants also suggested that ensuring companies have a commitment to implementation, a program to comply with the regulations and internal corporate audit processes would help ensure compliance. It was also suggested that there is need for the NEB



to develop a process to address issues that can arise when other regulatory agencies are involved in generating compliance requirements.

Industry respondents were asked for specific evidence that their company is compliant with the OPR-99 and other applicable GOR elements. Many participants simply stated that they had “passed” an NEB audit, and in some instances made significant changes as a result of the audit, particularly to Emergency Response Programs. Others emphasized the value of audits in general, including internal audits, NEB audits, and other external audits as verification of compliance. Informal assessments and follow-up processes based on audit results were also useful to ongoing oversight of compliance. ISO 14000 certification regarding environmental management and the use of risk-assessment software were also cited as useful measures.

Measurement, in fact, is a major staff concern in both a company’s level of performance as well as the NEB’s ability to measure the differences in performance across a range of companies that have incorporated management plans in response to GOR. Questions asked centered on how well companies were doing and what difference it has made.

5.2 Auditing

Stakeholders were asked if they viewed the NEB’s process of ensuring compliance, particularly the primary tool of auditing, as adequate and effective. While there was general agreement among all respondent groups that a compliance assurance mechanism was necessary for the Board to fulfill its mandate, the current audit process evoked more intense comment than any other topic.

Most agreed that the audit process is effective, or at least has the potential to be effective depending upon the ability of a company to understand GOR-based requirements found in OPR-99, including those for certain management and operational plans. There was a general consensus among those that were familiar with auditing that the process consumes a high level of resources of both the NEB and regulated companies. It also requires well qualified auditors and a follow-up process to ensure the audit results/recommendations are addressed. When asked about the reasonable frequency of compliance auditing, most participants identified a 3-5 years audit cycle as appropriate and several suggested that factors such as level of



compliance (mainly determined from prior audit results or identified performance issues) should be considered in determining audit frequency for individual companies.

Among G1 companies, there was concern that the role of the auditor is still not clear, a situation that is also impacted by alleged inconsistent interpretations of GOR requirements in OPR-99. Furthermore, there were reports of difficulties with the determination of compliance through the audit process. G2 participants appeared to experience greater difficulty with the audit process than did G1 companies. While some G2 respondents reported positive experiences with NEB staff and the assistance provided to the company in its compliance efforts, others reported difficulty understanding the process and the criteria against which they were being measured. Those G2 pipeline entities that are part of exploration and production companies, and that experienced difficulties in the audit process, believed that their overall management processes were adequate for their NEB regulated pipelines. They questioned whether audit staff were sufficiently flexible in evaluating the merits of these programs, particularly with respect to risk-based approaches.

Most NEB staff and management believe that audits are a critical component of effective GOR implementation, and that there is a need to ensure that well-qualified people are assigned to these complex tasks. There must also be a clear understanding of expectations and consistency of approach among the audit teams. NEB participants noted that the audit process is continually evolving to address industry feedback. The NEB has made efforts to improve the process, including improving auditor qualifications in recognition that they now must judge company activities based on domain knowledge rather than on prescriptive documents. Some respondents felt that there were inconsistencies in how compliance is measured, perhaps somewhat due to the level of professional judgment involved.

NEB management participants generally suggested that the audit system has become more open and represents a more cooperative relationship with companies. Although compliance mechanisms are developed by each company to suit their particular organization, it is difficult to customize the audits to accommodate such variety. There is, however, a need for a follow-up process and NEB management would like to see a process developed to solicit Industry input on the evolving audit process.



5.3 Progress Toward Implementation of GOR

5.3.1 NEB Leadership and Adaptation to GOR

When asked if the Board has effectively led industry toward GOR compliance, stakeholders, industry, and NEB personnel all reported that the NEB had made significant strides. Respondents noted that the message communicated is a positive one based on how GOR provides opportunities for flexibility to individual companies in the achievement of regulatory compliance. The majority of stakeholders who responded felt that the NEB had assumed a leadership role in this area through developing the regulation (OPR-99), educating stakeholders and implementing the GOR process.

Industry participants consistently indicated that the introduction of GOR has been a positive step and that significant strides have been made in its development. Workshops and solicitation of input on changes to the Filing Manual have been appreciated. It was reported that certain provincial and other federal agencies are following the implementation carefully and some may be considering the introduction of GOR elements into their own regulations. One outstanding consideration is the applicability of GOR to the regulation of more complex and broader ranging industry activities.

NEB staff reported several changes in how their business units have been managed since GOR was first implemented, most notably the introduction of the audit program. Other changes experienced include:

- the Board's focus on new management programs and policies;
- an increase in level of management system knowledge across business units;
- improved understanding of GOR (confusion regarding enforcement decreased);
- move to integrate activities within applications and operations business units;
- more flexibility in how compliance is measured;
- improved internal communications; and
- a more systematic approach to, and integration of, Board processes.

NEB management indicated that there are some internal groups still in transition toward full adoption. Respondents agreed that understanding and application of GOR must be continually



improved across the organization. This would have the effect of reducing prescriptive tendencies and increasing consistency in guidance and support to industry and in clarifying expectations and auditing practices.

NEB staff and management emphasized that they have responded to Industry feedback and that the entire GOR process, including ensuring compliance, has evolved and will continue to do so. Suggestions for ensuring compliance included joint development of performance indicators with industry. This would help minimize interpretation differences. Another suggestion was to develop benchmarks against which compliance and change can be measured.

5.3.2 Application Process

Stakeholders (mainly industry representatives and regulatory agencies involved in application processes) reported that the public consultation process has improved and is being applied more frequently. Most stakeholder participants were not aware of any changes to NEB application policies. Changes that were viewed as positive included the First Nations Consultation memo and the changes to the General Filing Requirements. Participants noted that some companies have difficulty with the application process, e.g. NEB cycle times and the considerable time and resource demands of the process.

Several G1 companies reported that there had been significant changes to the application process, including changes to the filing manual and streamlining of the pre-filing process. Some companies have found that it is now a longer process (2–3 years) for minor applications, that it is harder to get approvals and that there are more information requests. Changes recommended (primarily related to OPR-99) include:

- develop small/medium/large project filing templates that decrease time required to complete;
- cooperate with other authorities to decrease time consumed in application reviews and generation of information requests (single window);
- expand the Streamlining Order;
- eliminate the application process for investigative digs; and
- provide a clearer definition of what is needed in applications and when to apply (most strongly indicated by G2 participants).

G2 companies commented on several aspects of GOR that are working well such as consideration for smaller projects and creativity and flexibility allowed in meeting environmental protection requirements. Some G2 participants indicated that they would prefer to simply comply with what regulators want, rather than to be required to develop and implement “systems” to comply with GOR.

NEB staff and management participants noted several changes in how companies respond to application requirements, as well as how the processes have changed. Companies now conduct pre-application meetings and the new filing format makes environmental screening processes more efficient. Staff also noted that the examination of applications is now more thorough and there is better internal and external communication regarding expectations, roles, and responsibilities.

5.3.3 Advances in Safety and Environmental Protection

Several questions were asked about the perceived safety of pipelines and their record on environmental protection. Although there were some variations in the questions asked, the responses of all groups were sufficiently similar to warrant discussion collectively rather than individually. These responses have been organized according to three broad categories that encompass the range of questions asked:

- indicators for improving pipeline safety and environmental protection;
- credit/cause for apparent decreases in frequency of pipeline ruptures and incidents; and
- suggested changes to GOR/OPR-99 to enhance safety.

Although participants identified many potential indicators for advancing pipeline safety and environmental protection, there was a common thread of caution against mistaken or over-zealous reliance on indicators and their interpretation. Indicators are often more about perception than they are representative of real operational factors. They are difficult to assess and the general consensus among industry was that, while they can have an important role in tracking performance and potentially highlighting areas for improvement, they should not be used as regulatory compliance tools. Most participants immediately identified the obvious indicators - numbers of ruptures and incidents. The frequency of each is typically low and they were not considered to be accurate indicators over the short term. It was also noted that

lagging indicators such as system failures can be more accurately measured than leading indicators (which may be more predictive); however, they might not appropriately reflect field conditions. Suggestions for what indicators should target included:

- cost efficiencies achieved with the same or better safety/environmental performance;
- incorporating international and other broadly recognized standards;
- indicators related to the product in the pipeline, the total length of pipelines and volume of product moved;
- indicators that focus on the cause of an incident; and
- comparing 'as-built' results with what had been planned and submitted for approval.

The NEB is currently working with CEPA to produce a list of appropriate and effective indicators. Other organizations, e.g. International Association of Oil & Gas Producers (OGP), are also focusing considerable effort on indicators.

Responses to questions addressing the cause of recent decreases in pipeline rupture and incident frequency were split (albeit with significant overlap) as to whether or not GOR played a significant role. Those that felt GOR did play a significant role cite the requirement for integrity management programs, improved monitoring and the threat of audits as contributing to better performance in pipeline safety. Several industry respondents acknowledged that the NEB has played a significant role in maintaining industry focus and public awareness on safety and environmental issues.

The contrary opinion is that incidents were initially low and that improved technology (inspection tools, pigging, monitoring, *etc.*), public awareness and public focus on safety and environmental issues were the drivers for the improved record. Many of the respondents from industry indicated that their internal criteria and standards are more stringent than those required by regulation. Proponents of both views encourage technology sharing (particularly opportunities created by CEPA and the NEB).

In discussion with participants about safety and environmental protection, it was generally acknowledged that a serious/catastrophic event was possible, if not likely. Those who addressed this potential scenario suggested that the most appropriate mitigation would be a risk based approach to safety and environmental protection. Such an approach would focus the greatest efforts on those locations where consequences of a failure would be highest.

5.3.4 Incentives

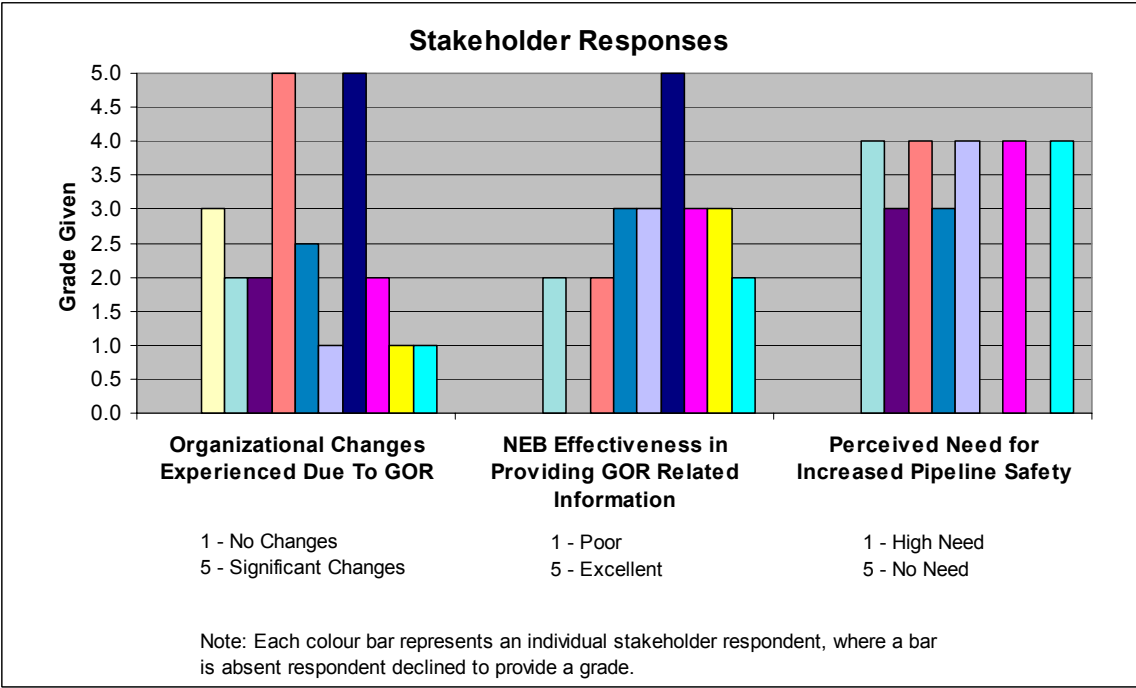
The majority of respondents from all groups, with the exception of stakeholders, indicated that GOR is not inherently incentive-driven, i.e. it does not reduce operating costs. Industry representatives indicated that the implementation of OPR-99 increased resource demands. It was also noted by all groups however, particularly G1 and G2 companies, that GOR does offer flexibility, adaptability and an opportunity to be innovative in achieving compliance. It was generally believed that the inherent flexibility of GOR as represented in OPR-99 enables companies to implement new approaches and technologies more quickly than when following prescriptive regulations which can be slow to accommodate advances. This flexibility was often cited as a noteworthy incentive and a significant factor in a generally strong positive response in spite of recognition that the same flexibility has posed problems in interpretation and implementation (e.g. in the audit process).

5.4 Summary of Quantitative Responses

In an effort to more clearly identify gaps in opinions and understanding between respondent groups, interviewees were asked to grade concepts or ideas by evaluating particular questions on a scale of 1 to 5, with 1 generally indicating an unfavourable response and 5 a favourable response. Respondents sometimes indicated that they had no experience in the particular area and, in such cases, they declined to provide scores. The following section provides a summary of information gathered via this technique.

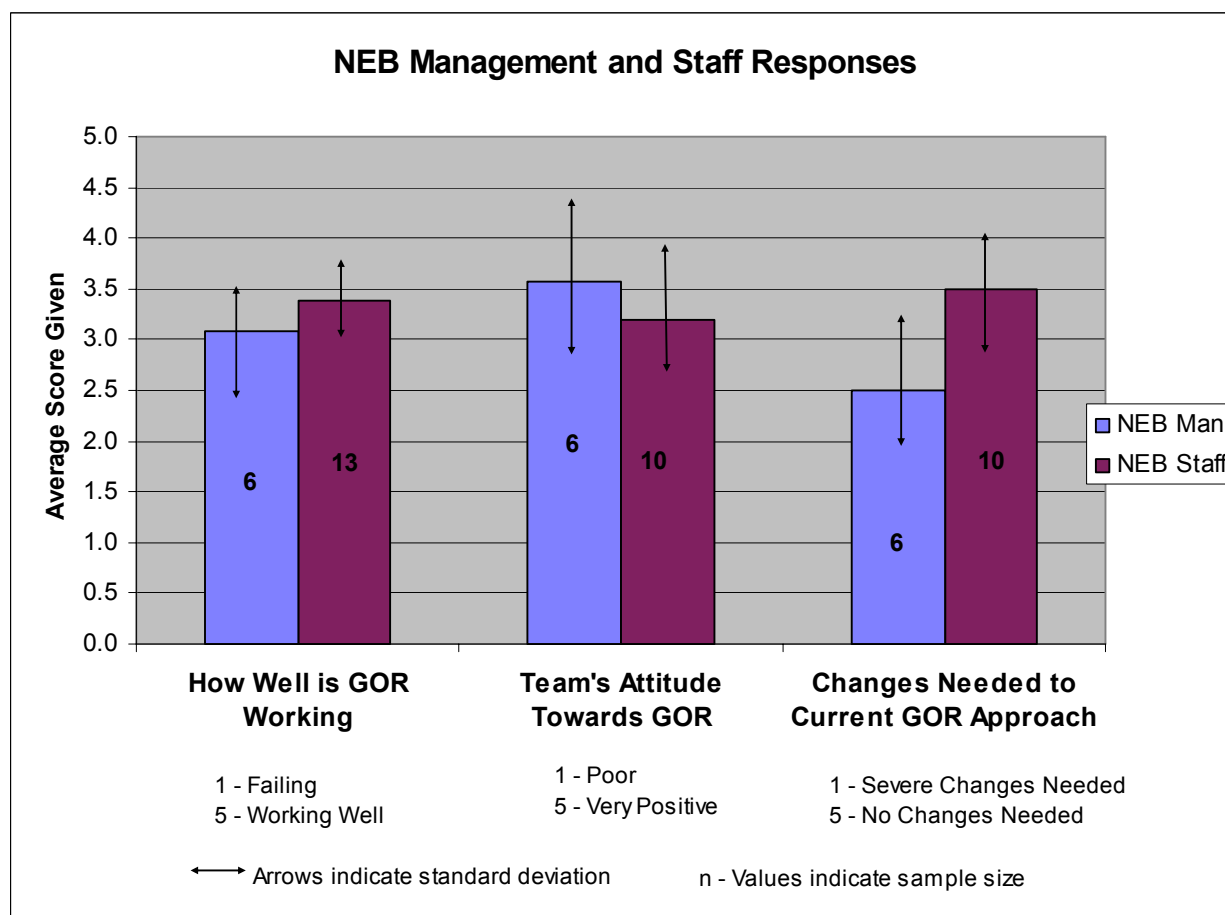
Perceived changes that organizations experienced as a result of implementation of GOR varied dramatically and were mainly dependent on how closely a particular organization worked with the NEB. Two stakeholders interviewed declined to offer any score values. Overall, stakeholders felt that the NEB had put forth an adequate effort in providing GOR related information, as indicated by the ratings illustrated in Figure 3. When asked if they felt there was a need to increase pipeline safety stakeholders scored the pipeline industry from 3 to 4 out of a possible 5. Scoring for this question appears to reflect the general belief that NEB regulated pipelines are safe, but more can always be done.

Figure 3: Stakeholder Responses



As Figure 4 indicates, both NEB management and staff had moderately positive views on the success of GOR. The management group generally felt more strongly that adjustments to GOR approaches might be warranted. (Industry interviewees generally found the current approach adequate. Suggested changes mainly were related to communication, cooperation and auditing.

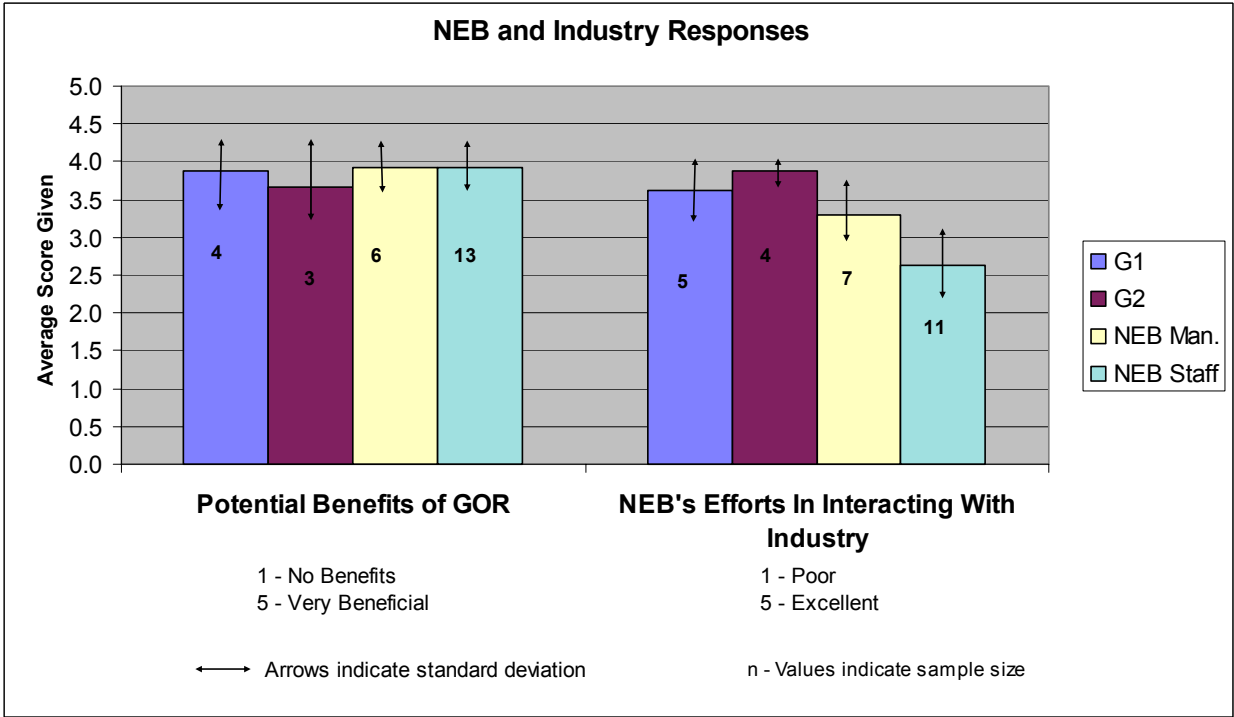
Figure 4: NEB Management and Staff Responses



Regulated companies, NEB management and NEB staff were all asked for their view on the potential benefits of GOR and on whether the NEB had done an adequate job in interacting with industry. As indicated in Figure 5, all respondent groups were consistent in indicating that GOR had potential to produce positive benefits. Representatives from regulated companies and NEB management were reasonably satisfied with NEB's effort in interacting with industry. NEB staff

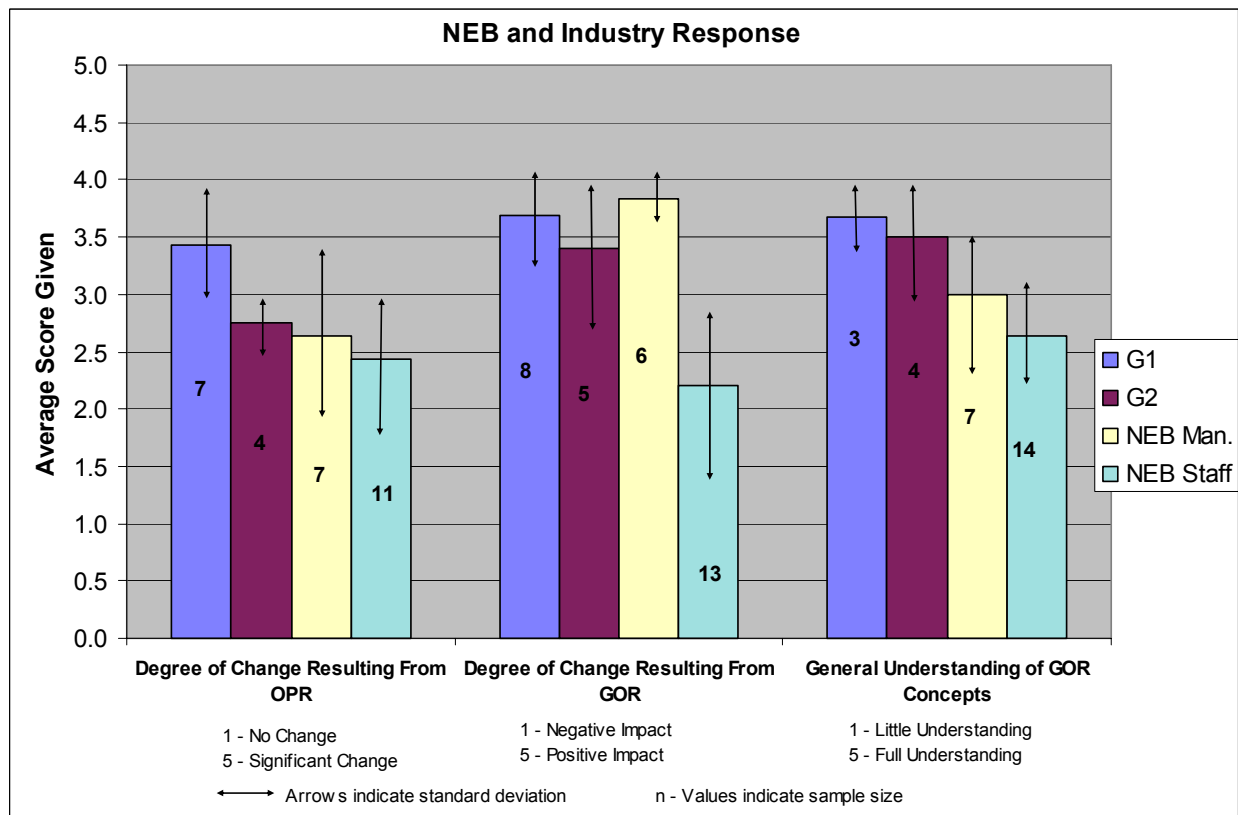
indicated the strongest desire to increase interaction with industry. It should be noted that half of the industry respondents declined to grade these two questions stating that they could not provide meaningful scores.

Figure 5: NEB and Industry Responses re GOR Benefits and NEB/Industry Interaction



Regulated companies, NEB management and NEB staff were asked if both GOR and OPR-99 had changed the way they carried out their work and if there was a general understanding of GOR concepts within their group. As illustrated in Figure 6, respondents felt that GOR had impacted work processes more than did OPR-99, perhaps somewhat reflecting the individuals' positions and responsibilities. NEB staff believed themselves to be affected to a lesser degree than other groups; however, the variation of responses was greatest in this group. It was interesting to note that industry representatives graded their understanding of GOR higher than did NEB personnel.

Figure 6: NEB and Industry Response re Understanding of, and Change Due to, GOR



6.0 SUMMARY AND RECOMMENDATIONS

Given the pipeline industry's good safety record, a serious pipeline rupture in Canada is generally viewed as a low probability event; however, it is acknowledged that there is the potential for greater consequence from a major incident. Therefore, consideration must be given in the regulatory system to the likelihood of a higher consequence event. Since low probability events are difficult to regulate in terms of prediction and prevention due to the wide range of possible scenarios, the most efficient and effective regulatory approach is likely to be one that sets minimum standards for all pipelines (prescriptive), while directing companies to focus additional efforts to address the unique risks of their particular pipeline systems (goal/performance-based). Such a system would focus on results, clarify accountability and responsibility and encourage innovation.

Several industry representatives and stakeholders posed the question - "What more can be done to improve pipeline safety?" Over the past three decades, the approach to safety and environmental protection has been evolving from incident response to prediction and prevention. All interviewed groups identified prevention as the principal mechanism for achieving the common goal of reducing risks. The most effective strategy for prediction and prevention would involve both companies and regulatory agencies in a cooperative venture. GOR is generally viewed as a positive step toward meeting the goal of advancing pipeline safety and environmental protection. It can provide industry the flexibility to apply its knowledge and experience to address specific and unique operating conditions, and provide the NEB with reasonable assurance of compliance.

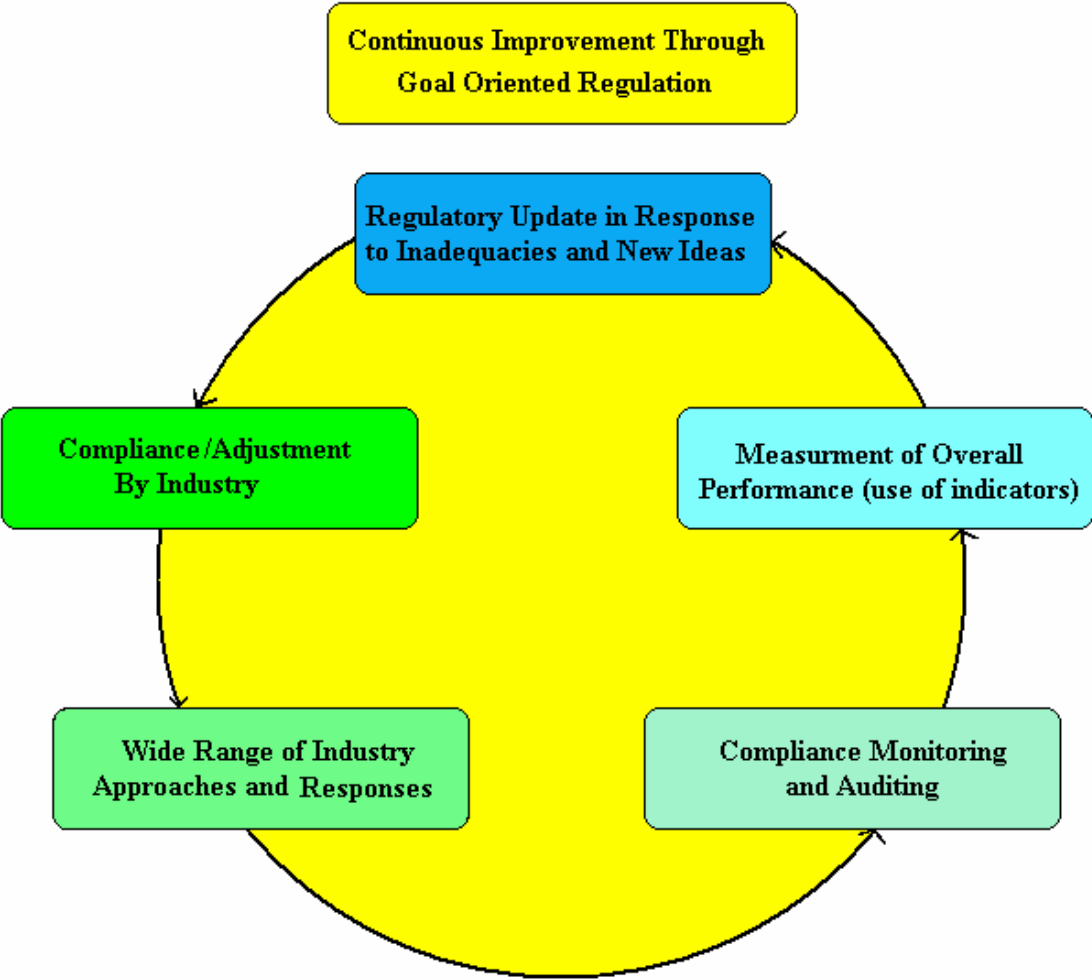
Since the introduction of the GOR approach by the NEB through the promulgation of OPR-99, there have been challenges faced in its implementation. The NEB has attempted to minimize uncertainty by providing guidance information. An auditing process has been established to measure compliance of individual companies and to provide a mechanism for exchange of knowledge and understanding between the regulator and regulated companies.

Through the auditing process and other interactions (workshops, meetings, etc.) with industry and stakeholders, the NEB has a mechanism to gather information on the ways in which companies attempt to achieve compliance and on the successes and failures of those attempts.



This constitutes a powerful tool in the Board’s drive to continuously improve pipeline safety and environmental protection regulation. Technological advances in such areas as integrity testing and risk assessment/management can be readily taken into account to improve safety and environmental protection in the GOR system without necessitating a change in the Regulation itself. The continuous improvement process is illustrated below in Figure 7.

Figure 7: Continuous Improvement through GOR



Goal-oriented regulation is more adaptable to changes in technology than is prescriptive regulation. It has the ability to accommodate changes more quickly and efficiently because those changes can be handled administratively, without the need to modify the regulation as would be the case for prescriptive requirements. Prescriptive regulation could therefore delay the introduction of novel technology and/or approaches, and thereby stifle innovation. The process of amending statute or regulation is time-consuming in any jurisdiction. Goal-oriented regulation, by contrast, allows for professional judgment and acceptance of new ways to meet or exceed the intent of the regulation.

Canadian regulators appear to be following the progress of the NEB's GOR approach with keen interest. Some of the regulators interviewed indicated that, in their view, their agencies already have elements within the administration of their regulations that are consistent with GOR, e.g. through the provision of latitude to apply for exemptions or to use alternative means of complying with prescriptive elements in particular circumstances. In some jurisdictions, prescriptive elements have been removed and replaced by reference to documents/standards outside of the regulatory regime, e.g. CSA standards. This approach accommodates change through the referenced document or standard rather than through modification of the regulation itself.

Over the course of thirty-nine interviews, two focus group discussions and informal discussions, several specific issues were raised. These were generally substantiated with examples that were directly relevant to the participants or to their organization's experience. Perceived gaps in regulatory processes, structures or perceptions were recorded. Issues or gaps were deemed to be significant if:

1. they were mentioned by more than one respondent;
2. the issue or gap was viewed as having the potential to impact the relationship among the regulator, industry and stakeholder; or
3. it was one that could, in the judgment of the consultant, significantly impair the achievement of good safety or environmental performance.

Significant issues and gaps have been summarized below in point form and are addressed through related recommendations where practical. In some cases, one particular recommendation addresses more than one issue. An attempt has been made to recognize the needs and perspectives of all groups represented in this evaluation. Matrix has reviewed the

NEB Act and various regulations in developing recommendations, but has not investigated the legal ramifications of these recommendations. Rather, the recommendations provide direction in advancing the regulatory regime within the context of GOR. Recommendations have been numbered (R-1, R-2, etc.) and assigned a priority of medium or high based on an inferred need to address specific issues or gaps on a priority basis. High priority recommendations should be considered within six months; medium priority recommendations should be addressed within six to twelve months.

6.1 Compliance Auditing

The audit process is one of the most prominent features of the GOR approach, and the one that evoked the most comment on perceived issues:

- **Inconsistency** – Most of the industry respondents perceived some inconsistency in the audit process and noted varying levels of experience of NEB auditors. Both NEB staff and management acknowledged that this was an area of concern. (R-1, R-2)
- **Subjectivity** – GOR has increased the degree of subjectivity inherent in assessing compliance by introducing the management system audit that requires considerable professional judgment by the auditors. Companies emphasized this issue, stakeholders identified it as an area of potential difficulty in a GOR regime and NEB staff and management noted that subjectivity could result in inconsistency. (R-2, R-3)
- **Guidance vs. Prescription** – There is potential for guidance notes to be viewed as prescriptive requirements by all parties. There were suggestions that some NEB auditors, particularly those with less experience, have a tendency to use the guidance notes found in OPR-99 as standards for measuring compliance. (R-1, R-2)
- **Technical Expertise** – All groups agreed that audit success is significantly influenced by the level of technical expertise of the auditors because the focus is on programs and systems rather than on more finite compliance elements. (R-3, R-4, R-5)
- **Resource Demands and Audit Frequency** – The audit function designed to measure compliance has increased demands on resources and time, both for companies and

especially for Board staff engaged in the audit process. This is reflected in the capacity of the Board to conduct only a limited number of audits in any given year.

Given current audit cycle times and staff capacity, certain companies may not undergo the first or subsequent audits for several years, thereby bringing into question assurance/confirmation of compliance. (R-5)

- **Audit Report** – The majority of industry respondents indicated that audit reports have sometimes been general rather than precise, and findings and recommendations have apparently not always been consistent with discussions held during close-out meetings. In such instances, there is often no reference to the close-out discussion or rationale given for apparent changes in thinking. (R-6, R-7)
- **Duration** – Several industry respondents indicated that excessive time often elapses between completion of an audit, issuance of audit reports and approval of response plans. (R-8)
- **Lessons Learned** – Though lessons have been learned by the auditors from completed audits, they have not always been effectively applied to subsequent audits. (R-9)

Recommendations

- **R-1** – Develop a detailed Standard Operating Procedure for NEB audits, in consultation with industry and other government agencies. This document should be distributed to industry so that companies can “align” their internal compliance and audit programs with the NEB requirements. This document would address requirements, audit process, expectations to achieve compliance and other topics (e.g. appropriate use of Guidance Notes) so that areas of uncertainty are minimized and efficiency is maximized. (Priority – **High**)
- **R-2** – Assign NEB auditing responsibilities only to personnel specifically trained and qualified to carry out the audit functions. Qualification standards should be described in an internal document prepared by NEB experts. Consideration should also be given to the retention of audit professionals from the consulting sector to supplement NEB’s capacity. (Priority – **Medium**)

- **R-3** – Audits should be carried out in a manner that minimizes the need for subjective judgments. In a GOR regime, it is not possible to eliminate subjective assessment. In order to reduce areas of disagreement in professional judgment between the auditor and a company, decisions should have a technical basis or rationale. (Priority – **High**)
- **R-4** – NEB should continue to foster expertise and information sharing by supporting industry seminars and workshops. NEB should also consider further developing technical exchange opportunities with other international regulators (specifically those in the U.S., Britain and Australia). (Priority – **Medium**)
- **R-5** – NEB should consider Alberta Labour’s model of auditing company safety programs by requiring companies to periodically (possibly annually) submit internal or external audit findings in a formal process. A “certificate of regulatory compliance” signed by an officer of the company should be incorporated into such a process. (Priority – **High**)
- **R-6** – An Executive Summary is now incorporated into pipeline audit reports and efforts are underway to improve the quality of the writing. Success of these initiatives should be monitored and further modifications made as appropriate, e.g. prioritization of action items. (Priority – **High**)
- **R-7** – A procedural mechanism should allow companies to formally request a review of specific NEB audit findings in order to eliminate misunderstanding in cases where the draft audit comment process is inadequate. In particular, this would include clarification of the rationale in cases where NEB rejects company suggestions. (Priority – **Medium**)
- **R-8** – Turnaround times should be tracked for audits, audit reports and maintenance applications. Where possible, mechanisms should be found to continue to streamline processes and reduce unnecessary delays. (Priority – **Medium**)
- **R-9** – NEB should establish an internal tracking system to accumulate “lessons learned” from completed audits so that future audits can take advantage of them. A document describing these accumulated lessons should be reviewed by senior staff periodically to determine if any procedural or other modifications are warranted. (Priority – **Medium**)

6.2 Other Issues and Gaps

- **Enforcement** – There is a perception among some stakeholders that the NEB should apply stricter enforcement measures in cases of serious or repeated noncompliance. This may become more important under GOR if the frequency of compliance assessment (audits) is reduced. (R-10)
- **Risk Management** – Several companies suggested that the use of risk management tools in meeting compliance requirements should be expanded. The vastness and variety in Canadian terrain and the varying age of installed pipeline systems suggest that a risk management approach could be useful to prioritize issues and responses for both industry and the NEB. Application of risk based elements could increase the burden of due diligence on the Board as this approach applies judgement to define and focus effort on high priority areas/issues. The possibility exists that a significant event could occur at a site which was not deemed to a priority. (R-11)
- **Other Regulatory Agencies** – The effectiveness of the GOR approach may be reduced where other regulatory agencies continue to follow a prescriptive or different approach. This issue was particularly noted in the case of applications. The NEB should continue, and increase, its efforts to promote the GOR approach and achieve consistency in compliance requirements for projects that involve other regulatory agencies such as DFO and CEAA. (R-12)
- **Management System and Culture** – Several NEB staff and management respondents suggested that the corporate culture of the Board in areas not directly related to operations has not changed sufficiently to fully accommodate the GOR approach. The implementation of a new “Management System Framework, based on ISO 9000 concepts, may improve matters in this area. (R-13)
- **Indicators** – There appears to be no current consensus on appropriate and reliable indicators for measuring performance and trends in safety and environmental protection, though numerous lists exist. It is essential to define the purpose of indicators before selecting them. Lagging indicators may be useful for determining trends and benchmarking,

whereas leading indicators may prove more useful for predictive and decision-making purposes. (R-14)

- **Applications** – Several industry respondents indicated that excessive time often elapses between application and approval. As well, several interviewees felt that the GOR process could be undermined when other regulatory agencies apply requirements during the application process that are inconsistent with the spirit and intent of OPR-99/GOR. (R-8 and R-12)

Recommendations

- **R-10** – Consider an enforcement mechanism such as the Alberta Energy and Utilities Board’s pipeline stepladder enforcement approach. Events of non-compliance could result in a movement of the company up the enforcement ladder, resulting in more frequent auditing/inspection and application of prescribed sanctions. (Priority – **Medium**)
- **R-11** – Consider the value of risk management approaches and, if warranted, work with industry and other agencies to establish a set of guidelines for their application. Special attention should be given to determining where such approaches add value to the regulatory process as they may not be appropriate in certain instances. (Priority – **Medium**)
- **R-12** – NEB should continue to work closely with other regulatory agencies (DFO, CEAA, provincial agencies) and associations such as CSA to encourage mutual understanding and to advance consistency in safety and environmental regulation of pipelines in Canada. (Priority – **Medium**)
- **R-13** – It is recommended that the NEB develop a formal quality assurance function within the context of its new “Management System Framework” to assist staff in providing consistent services. A staff member assigned to quality assurance would ideally be someone who has hands-on experience with the majority of NEB work functions and would work with staff on a day-to-day basis to assist in consistent application of Standard Operating Procedures, to document and collect data consistently and to share ideas between work groups. (Priority – **Medium**)

- **R-14** – The role of indicators in the regulatory strategy should be defined, along with specific goals and objectives for their use. The NEB should select, from the range of indicators currently in use worldwide, those which will contribute to the goals and objectives. It may also be necessary to develop new indicators. The work on safety and environmental indicators currently underway at CEPA, with NEB participation, should provide important input. Considerations must include ease of data collection among the variety of regulated companies. (Priority – **Medium**)

Following is a summary table of the recommendations outlining suggested tasks and expected benefits.

Table 1: SUMMARY OF RECOMMENDATIONS

Recommendation	Gaps and Issues Addressed	Suggested Tasks	Expected Benefits
<p>R-1</p> <p>Develop a detailed Standard Operating Procedure for NEB audits.</p> <p>(Priority – High)</p>	<p>Inconsistency in the audit process.</p> <p>Viewing guidance notes prescriptively.</p> <p>This document would contain information on the audit process, expectations for compliance, conducting audits, close-out meetings and use of guidance notes.</p>	<p>Consultation with industry and other government agencies.</p> <p>Distribute document to industry.</p>	<p>Alignment of internal compliance and audit programs with the NEB.</p> <p>Reduces occurrences of auditors with inadequate experience.</p> <p>Reduces tendency to use the guidance notes as standards for measuring compliance.</p>
<p>R-2</p> <p>Develop qualifications standards for auditing.</p> <p>(Priority – Medium)</p>	<p>Inconsistency in the audit process.</p> <p>Viewing guidance notes prescriptively.</p>	<p>Match pipeline company compliance elements with NEB job/task functions.</p> <p>Assign a level of job/task experience required for auditing.</p>	<p>Reduces auditing inconsistency.</p> <p>Assures high level of experience in auditing/interacting with company representatives.</p> <p>Reduces tendency to use the guidance notes as standards for measuring compliance.</p>
<p>R-3</p> <p>Develop a document that provides technical support for areas of subjectivity.</p> <p>(Priority – High)</p>	<p>Compliance subjectivity.</p> <p>Questionable level of technical expertise of auditor in assessing compliance.</p>	<p>Identify main areas of assessing compliance that involve subjectivity.</p> <p>Develop a document or information letter that outlines the technical considerations in areas of subjectivity.</p>	<p>Reduces potential for inappropriate findings based on subjectivity.</p>

Recommendation	Gaps and Issues Addressed	Suggested Tasks	Expected Benefits
<p>R-4</p> <p>Foster information sharing.</p> <p>(Priority – Medium)</p>	<p>Continued sharing of technical expertise.</p> <p>Development of continual improvement opportunities.</p>	<p>Review past seminars and workshops for successes.</p> <p>Identify issues or information to be targeted.</p> <p>Post a schedule of NEB sponsored events.</p> <p>Initiate information/work exchanges with other countries and develop a communication strategy to share learning's with industry.</p>	<p>Enhances continual improvement opportunities.</p> <p>Fosters communication and consistency of understanding among the NEB, industry, other regulatory agencies and other stakeholders.</p> <p>Encourages consideration of alternate approaches and solutions to issues and gaps.</p>
<p>R-5</p> <p>Consider incorporation of a certificate of regulatory compliance.</p> <p>(Priority – High)</p>	<p>Demand for technical expertise.</p> <p>Concern for increasing resource demands.</p> <p>Lengthy cycle times for NEB in assuring compliance.</p>	<p>Examine the suitability of a “certificate of compliance” mechanism.</p> <p>Consider a process of evaluating internal/external companies’ audits (e.g. Alberta Labour approach).</p>	<p>Increased access to technical expertise.</p> <p>Reduction of resource demands on NEB.</p> <p>Reduction of formal compliance audit cycle times.</p> <p>Provision of a potentially strong enforcement tool</p>
<p>R-6</p> <p>Audit report modification.</p> <p>(Priority – High)</p>	<p>Recommendation/findings clarity.</p> <p>Disagreement between NEB and regulated company on audit close-out findings.</p>	<p>Omit generalizations.</p> <p>Prioritize recommendations and findings.</p> <p>Monitor effectiveness of process changes.</p>	<p>Clarifies requirements.</p> <p>Prioritizes corrective actions.</p>
<p>R-7</p> <p>Implement mechanism to respond to all requests for changes in audit reports.</p> <p>(Priority – Medium)</p>	<p>Rationale for audit findings and recommendations.</p> <p>Claims that audit report findings can sometimes be general.</p> <p>Potential discrepancies between close-out meetings and report findings and recommendations.</p>	<p>Implement a process that would formally address all companies’ requests for changes in audit reports with an explanation for the decision.</p> <p>Update appropriate guidance notes or provide an information letter.</p>	<p>Provides forum for discussion.</p> <p>Systematically provides information to companies on any rejections of requests for change.</p>

Recommendation	Gaps and Issues Addressed	Suggested Tasks	Expected Benefits
<p>R-8</p> <p>Monitor turnaround times for audits, audit reports and new project and maintenance applications.</p> <p>(Priority – Medium)</p>	<p>Lengthy time between completion of an audit, publication of results and approval of response plans.</p> <p>Long time between application submission and approval.</p>	<p>Explore mechanisms to streamline processes and reduce unnecessary delays.</p> <p>Work with other regulatory agencies and industry to seek more efficient approaches to addressing regulatory requirements.</p>	<p>More efficient approval process.</p> <p>Reduced work load on staff.</p> <p>Faster maintenance response times.</p>
<p>R-9</p> <p>Establish an internal tracking and evaluation system to take advantage of “lessons learned”.</p> <p>(Priority – Medium)</p>	<p>Lessons learned from completed audits not always been effectively applied to subsequent audits.</p>	<p>Establish auditing issues tracking system (possibly similar in structure to safety incident reporting).</p> <p>Schedule periodic review of information collected and make recommendations for changes were appropriate.</p>	<p>Avoid repetitive problems.</p> <p>Provides opportunity for continuous improvement.</p>
<p>R-10</p> <p>Consider need for a more rigorous enforcement system for non-compliance.</p> <p>(Priority – Medium)</p>	<p>Perception that the NEB enforcement measures are inadequate.</p>	<p>Examine need for an enhanced enforcement system for continued compliance issues, possibly patterned after Alberta Energy and Utilities Board’s stepladder approach.</p>	<p>Provides stronger incentive for compliance.</p>
<p>R-11</p> <p>Consider risk management approaches.</p> <p>(Priority – Medium)</p>	<p>Risk management approaches not sufficiently applied in regulatory system.</p> <p>The vastness and variety in Canadian terrain and the varying age of installed pipeline systems suggest need for risk management.</p>	<p>Conduct extensive review of risk management approaches, including liability risks to NEB.</p> <p>Where appropriate, broaden management approaches to include aspects of risk management.</p> <p>Measure successes and failures.</p> <p>Update guidance notes where appropriate.</p>	<p>Broadens flexibility of GOR.</p> <p>Helps focus time and resources.</p> <p>Focuses prevention efforts on higher risk areas (e.g. populated areas).</p>

Recommendation	Gaps and Issues Addressed	Suggested Tasks	Expected Benefits
<p>R-12</p> <p>Continue to work closely with other regulatory agencies.</p> <p>(Priority – Medium)</p>	<p>Reduced effectiveness of the GOR where other regulatory agencies continue to follow a prescriptive or different approach.</p>	<p>Interact with agencies such as DFO, CEAA, provincial agencies and associations such as CSA to encourage mutual understanding and to advance consistency.</p>	<p>Reduces GOR backsliding.</p> <p>Increases acceptance and effectiveness of GOR approaches.</p> <p>Opportunity to advance GOR.</p> <p>Encourages consistent approach to regulatory applications.</p>
<p>R-13</p> <p>Develop a formal quality assurance function.</p> <p>(Priority – Medium)</p>	<p>NEB staff may not have a sense that there is a consistent culture centered on GOR.</p> <p>Inconsistency of approaches among NEB staff.</p> <p>Need for strong cooperative working relationships among staff.</p>	<p>Establish formal quality assurance function within the context of its new “Management System Framework”.</p> <p>Provide staff with details of the roles, authorities and responsibilities of quality assurance personnel.</p> <p>Under this function, develop or improve standard operating procedures, tracking and measuring procedures, documentation procedures, etc.</p>	<p>Improvement in interactions among business units and teams.</p> <p>Increase in consistency of approaches, documentation and tracking and measuring systems.</p>
<p>R-14</p> <p>Examine role of indicators in GOR.</p> <p>(Priority – Medium)</p>	<p>No current consensus on appropriate and reliable indicators for measuring performance and trends in safety and environmental protection.</p>	<p>Define role and objectives of indicators within the context of GOR.</p> <p>Continue to work with CEPA to establish industry measuring tools.</p>	<p>Provides a basis for measuring pipeline safety and environmental protection performance.</p> <p>Consistency in measurement of performance variables and better information sharing.</p>

7.0 CONCLUSION

Ultimately, the selection and implementation of a successful regulatory strategy necessitates striking a balance between maximizing efficiency and effectiveness on the one hand and fulfilling public expectations for safety and environmental protection on the other. The balance is a dynamic one and calls for periodic readjustments. In fulfilling its mandate to protect the public interest, the NEB must maintain the confidence of the public, while discharging its duties in a technically sound and efficient manner.

From the extensive interviews conducted with NEB management and staff and regulated company and stakeholder representatives, it is reasonable to conclude that the GOR concept is a valid one, and its introduction through OPR-99 has been successful. There is room for improvement and, despite the five years of experience gained since OPR-99 was brought into effect, there is not yet a consistent shared understanding among, and sometimes within, the NEB, regulated companies and other stakeholders on the concept and reality of GOR.

GOR provides a mechanism to achieve a high level of safety and environmental protection in the NEB-regulated pipeline industry while encouraging innovation and permitting individual companies to achieve compliance in ways that are suited to their own circumstances. The NEB should continue to adopt and expand GOR, but must also focus immediate attention on the issues and gaps identified in this evaluation.

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APPENDICES

Appendix 1: List of Companies and Stakeholders Interviewed

Appendix 2: Evaluation Approach, Methodology and Process

Appendix 3: Summary of Interview Questions

APPENDIX 1: COMPANIES AND STAKEHOLDERS INTERVIEWED

NEB-Regulated Pipelines

Group 1

Alliance Pipeline Limited

Cochin Pipe Lines Ltd.

Enbridge Pipelines Inc.

Enbridge Pipelines (NW) Inc.

Maritimes & Northeast Pipeline Management Ltd.

Terasen Pipelines Inc.

TransCanada PipeLines Limited

TransCanada PipeLines Limited, B.C. System

Foothills Pipe Lines Ltd.

Trans Québec & Maritimes Pipeline Inc.

Trans-Northern Pipelines Inc.

Westcoast Energy Inc. (carrying on business as Duke Energy Gas Transmission Canada)

Group 2

BP Canada Energy Company (represented by Cochin Pipe Lines Ltd.)

Champion Pipeline Corporation Limited

ConocoPhillips Canada Limited

Encana Corporation

Husky Oil Limited

Husky Oil Operations Limited

Montreal Pipe Line Limited

Plains Marketing Canada, L.P.

Stakeholders

Alberta Energy and Utilities Board

Alberta Environment

Alberta Farmers Advocate

Canada-Nova Scotia Offshore Petroleum Board

Canadian Association of Petroleum Producers

Canadian Energy Pipeline Association

Canadian Standards Association

Fisheries and Oceans Canada

Native Council of Nova Scotia

Office of Pipeline Safety,

U.S. Department of Transportation

Transportation Safety Board of Canada

Treaty 8 Tribal Association

APPENDIX 2: EVALUATION APPROACH, METHODOLOGY AND PROCESS

1. Questionnaire Design

Questions were designed to facilitate discussion with the interviewees on the principal topics of relevance to the evaluation. Wherever possible, the same questions were asked in all interview categories (NEB management, NEB staff, industry and stakeholders); however, the context of the questions was often changed to suit the interviewee's status or circumstances. The interview questions were designed to determine each group's perspective on Goal-Oriented Regulation.

Questions were also designed to minimize biases and to encourage a free flow of information. Rating scales were selected for some solicited responses based on 1 through 5 values. This odd number scale was selected to provide interviewees who are neutral with a comfortable selection range. It also avoids data skewing which can occur with even number or smaller number scales. Whenever possible, the value one (1) was selected to represent an unfavourable condition/opinion and the value five (5) represented a favourable response.

Quantitative Data

Questions soliciting quantitative responses were designed to gather specific data from respondents on their assessment of various aspects of GOR. These data may also serve as a benchmark for future evaluations. Responses to these questions are quantifiable in that respondents were asked to rate a specific aspect of GOR on a scale of 1 to 5. These data were then complemented by respondents' explanations for their rating of that particular aspect of GOR. Some respondents declined to give grades in one or more questions. This data have been graphically represented elsewhere in this report; however, statistical analysis was not done.

Qualitative Data

Unlike quantitative data, qualitative data may be either extremely concise or may involve considerable detail as respondents attempt to elaborate particular aspects of their perspectives on GOR. Regardless of the complexity of the responses, efforts were made to ensure that all relevant information was recorded and taken into account in the analysis.

Matrix Consultants, with the help of a specialized software program, organized and analyzed information collected from the interviews. The analytical procedure incorporated the “tagging” of interview notes to maximize the use of all input and to maximize objectivity. Although all interviewee names remain confidential, each interview source was given a unique code that allows categorization of individuals according to:

- interview group (industry personnel, NEB personnel, other stakeholders);
- position in company (management personnel, operations personnel, etc.); and
- relative familiarity with GOR (Were they with the company before OPR-99 came into effect; did they participate in the development of current GOR initiatives?).

General information such as this is important as it helps to establish categories of difference that may exist between stakeholders, companies or personnel responding to questions, facilitating a better-informed analysis of the results.

A sub consultant to Matrix, organized and analyzed all information collected in these interviews separately from Matrix project personnel. This was done to compare consistency in issues identified and to provide a higher level of validity to the findings.

Information collected from the interviews was organized according to nine topics of interest reflecting the nine guidance questions included in the NEB statement of work. Information was further categorized according to the general topics/concerns that had surfaced. These categories became data “fields”. Once defined, the Consultants tagged all interview notes in such a way as to maximize the use of all input and to ensure objectivity in the analysis. This analysis process is flexible, allowing multiple tags for each interview segment, which is always associated with its identifying demographic data. The process enables the Consultants to perform their analysis while taking into account any differences between interview groups and general findings within each group.

As noted earlier, in some cases the interview questions asked of the different groups were the same or similar; however, other questions were specific to the unique nature of the group. Wherever possible, when questions were the same or similar among groups, the findings section provided comparisons between those groups.

2. Focus Groups

For this project, focus groups consisted of structured meetings of selected NEB staff for the purpose of gathering information to identify or further explore identified GOR or NEB process gaps and to suggest solutions to eliminate those gaps. The NEB Project Advisory Committee worked with Matrix to identify appropriate personnel for the focus groups. Matrix provided a facilitator and a recorder. Two focus group meetings were conducted with a total of 14 selected NEB staff.

Focus groups commenced with brainstorming to identify issues. Part of this process involved the completion of a questionnaire by the participants. Based on the initial discussions, identified gaps and issues were categorized and summarized. Participants were then encouraged to propose solutions to the gaps or issues that had been identified. The focus groups were initiated by providing attendees with information described in Section 3 below. Questionnaires were completed individually but in two groups.

3. Framing the Interviews

To supplement the letters that interviewees had received and to allow for clarification, an oral introduction preceded each interview and incorporated the following information:

1. The NEB is undertaking a comprehensive assessment of the GOR process relating to pipeline safety and environmental protection. As part of this assessment, Matrix is interviewing a series of stakeholders, including NEB management personnel and staff, operator company management and other stakeholders (advocates, regulators, landowners, interest groups).
2. The information collected will be analyzed for trends and areas of common concern. The identity of interviewees will be kept strictly confidential, and the data will be reported in aggregate form only.
3. Matrix will analyze both qualitative and quantitative data (in the form of repetitive comments or issues) for trends and areas of common concern. If there is significant support for particular issues, they will be discussed in the report. This will be the case whether the issue is noted in either qualitative or quantitative data.

4. Matrix will be responsible for completing the assessment and submitting a final report. The results of this comprehensive assessment will be used by the NEB as part of an evaluation of the impact that GOR has had on various stakeholder groups. The final report will contain a summary of the expressed concerns and make recommendations for future action that can be taken by the NEB to address them. A copy of the report will be made available through the Board.

It was deemed important that the participants understood the process for handling and using (or not) the comments that were received. If this was not clear, the participants might question the validity of the results because “their comments were not included in the final recommendations.” Since the interviewees were aware of the process details from the outset, their understanding of the results should be enhanced. It was also important not to key on OPR-99 or GOR too intensively in certain interviews as evidence of change could be more important than attribution or the recognition of terminology. In these instances the Consultant focused on:

- common trends;
- feasible ideas and solutions that can be implemented in the relatively short-term;
- common themes and opinions raised in NEB management interviews;
- views on measurements such as rupture and incident frequency as indicators of GOR success;
- “cultural” changes in companies and the NEB, since 1999, which may have been precipitated by GOR; and
- any change, since 1999, in how interviewees regard NEB and especially whether its GOR is viewed as a positive step in meeting the goal of advancing pipeline safety and environmental protection regulation of pipeline companies.

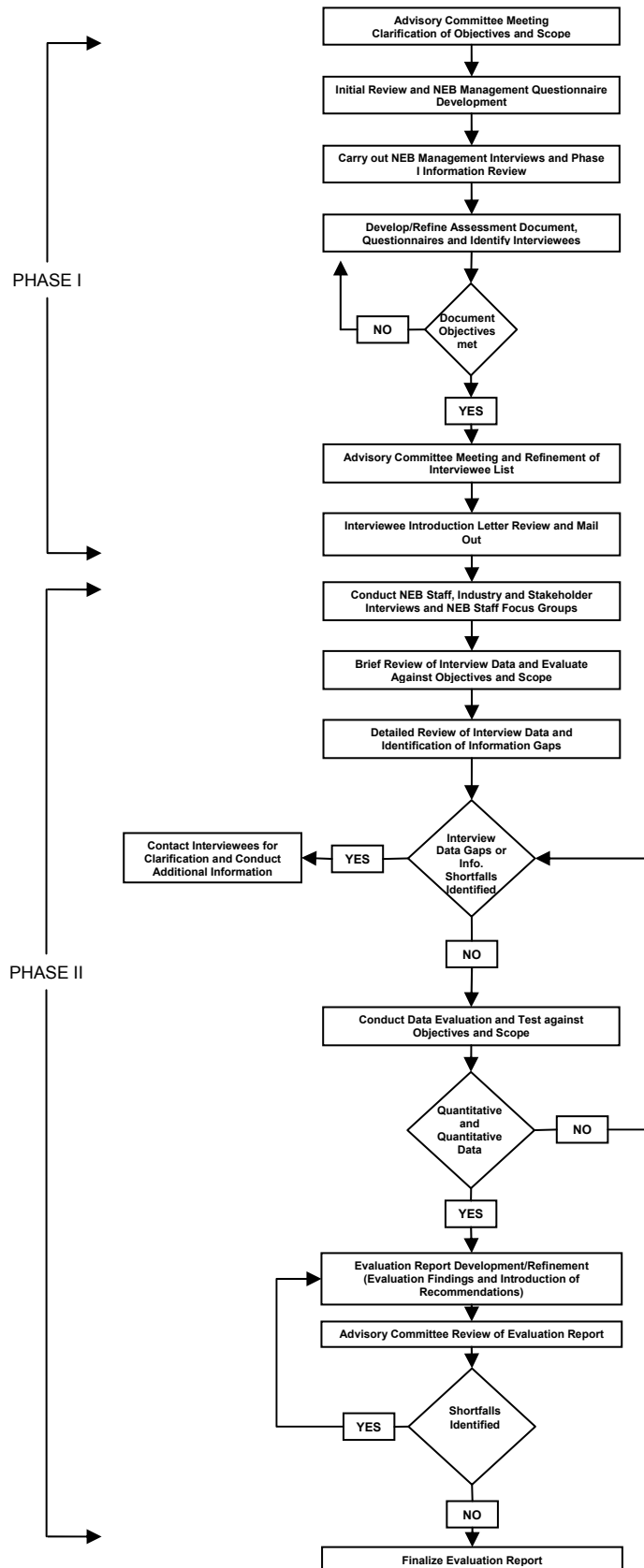
Prior to commencing the industry interview process, a kick-off meeting was held with the NEB to discuss the intent of each question and the kind of information the consultant hoped to gain.

4. Analytical Methodologies

The information collected from the interviews was sorted into general topics/concerns. This defined database “fields” for searching and organizing information. Once the fields were defined, the Consultants reviewed all the interview notes and tagged all relevant information segments to the appropriate field(s). This information could be categorized in multiple ways. Each entry may apply to more than one field. Information was coded to maximize the use of all input to ensure objectivity in analysis.

The analysis process was also flexible, allowing multiple codes for each information segment. Information can be separated into identified demographic categories to enable the analysis to take into account differences when comparing trends. Finally, this structured analysis allows for some degree of quantification of the data as each information segment carries a unique identity, thus allowing the determination of how many different respondents answered a question in a particular way.

GOAL-ORIENTED REGULATION – PROJECT EVALUATION PROCESS



APPENDIX 3: SUMMARY OF INTERVIEW QUESTIONS

Following is a list of questions prepared in advance, and vetted with the NEB for context, to guide the interview process and provide a framework for the discussions. Supplemental questions were asked during the interviews to further enhance the evaluator's understanding of the respondents' opinions.

1. NEB Management

- In terms of time commitment and effort, how does GOR fit into the future goals of NEB? In the future how could the current GOR system affect other initiatives?
- Is there a shared understanding within the executive team about the direction of GOR?
- Since initial implementation of the GOR in 1999 (i.e. Onshore Pipeline Regulations) has the NEB met your expectations in advancing GOR?
- What issues or concerns do you feel need to be addressed in the continued development of GOR in terms of needed tools, staff and expertise?
- With respect to NEB staff, what improvements could be made in moving GOR forward?
- Has industry offered suggestions in developing or improving the GOR system? What has stakeholder (landowners, provincial regulators, interest groups) response been?
- Do you have a timeline set for bringing GOR to full maturity and what do you foresee might be major hurdles?
- Can you comment on what the NEB would need to have in place in the future to defend the GOR system in the event of a serious pipeline failure involving safety or environmental issues?

2. NEB Staff

- Since 1999 when the Goal-Oriented Regulation (GOR) initiative began have notable changes occurred at NEB?
- Has GOR significantly impacted your particular business unit or team?
- What evidence is there that your business unit or team understands GOR?
- Outline new policies or programs that management has implemented since 1999 in response to GOR.
- How is the NEB keeping abreast of industry practices and current pipeline integrity research? Has this process changed since 1999?
- Give examples of potential benefits/disadvantages of GOR (i.e. less prescriptive regulations).
- Do you have a sense, or particular evidence, that GOR is working?
- What would be the best approach in ensuring pipeline companies were compliant?
- Have you been involved in audit processes outside of NEB? Compare that experience with NEB's audit process?
- Are changes evident in how companies make applications to NEB?
- Has NEB management staff done a sufficient job in describing new management programs and policies?
- Overall, did staff respond well to GOR when it was implemented? If not, has there been a shift since 1999?

- What would you consider to be the best indicator that GOR is promoting pipeline safety and environmental protection?
- If you were able to make changes to the current GOR approach, what would they be?
- Do you believe there have been changes to the reliability or safety of pipelines since 1999?

3. Stakeholders

- Discuss your relationship with the NEB and/or NEB regulated pipeline companies? How familiar are you with Onshore Pipeline Regulations (OPR) or Goal-Oriented Regulations (GOR)? Were you involved in your present position prior to 1999?
- How has NEB's introduction of GOR (i.e. a change in regulatory approach) affected your working relationship with NEB (or industry)?
- Within your organization, do you have a sense that there is a general understanding of the direction of NEB's regulatory approach?
- Would you say pipeline companies are more diligent in regards to pipeline safety and environmental protection than in the past?
- What issues or concerns need to be addressed in the continued development of regulations (GOR)?
- Do you feel the current regulatory approach provides incentives to industry to advance pipeline safety and environmental protection?
- With respect to providing industry with an effective approach to increased pipeline safety and environmental protection, what more could be done to ensure companies are compliant?
- Do you view NEB's process of ensuring compliance is adequate?

- With respect to your organization, have you noted a change in how companies approach the application process in terms of interaction/consultation?
- Has the NEB effectively lead industry towards a new direction of regulatory control (i.e. GOR or OPR)?
- What indicators would demonstrate to your organization that industry is moving towards safer and more environmentally acceptable pipelines?

4. NEB Regulated Pipeline Companies

- Does your company fall under both provincial and NEB regulatory control? How familiar is your company with the term Goal-Oriented Regulations (GOR)?
- Has the introduction of the 1999 Onshore Pipeline Regulations (OPR) impacted your company in some way? Why or why not?
- Do you view GOR (or the OPR) as a positive change in pipeline regulation?
- Does your company now generally understand GOR and the Board's GOR-based policies?
- Can you comment on the provincial versus NEB pipeline regulatory process for pipeline safety and environmental protection (advantages/disadvantages)?
- Has your company implemented new or innovative pipeline integrity testing techniques in the last five years? If yes, what was the reason? If not, has your integrity testing program changed in other ways?
- How does your company determine that it meets compliance for required programs (such as emergency procedures manual, continuing education program, integrity management program, training program, safety program and environmental protection)?

- Give examples of potential incentives that GOR provides to industry. Should other incentives be introduced?
- Do you have specific evidence that your company is compliant with OPR and other applicable GOR based regulations?
- Does NEB interact with industry effectively?
- Has your company undergone NEB audits or audits by government agencies other than NEB? Do you conduct internal or external audits on your company's compliance?
- If the NEB was to increase frequency of internal or external audits, would you view this as a positive step in providing assurance of compliance and an increase in pipeline safety and environmental protection?
- Has the application process to the NEB changed? Suggest any changes you would like to see.
- Do you believe the NEB has effectively lead industry toward GOR? Offer suggestions in how the NEB could be more effective on regulating pipeline safety and environmental protection.
- With respect to advancing pipeline safety what would you consider to be the best indicators that GOR is effective?
- What would you consider to be the best indicator(s) that environmental protection is improving?
- If you were able to make changes to the regulatory system to ensure pipeline facilities are safer for the future, what would they be?
- Have companies in the pipeline industry done a good job in sharing technology for the purpose of advancing pipeline safety and environmental protection?

- To what extent would you credit the pipeline industry's decreasing ruptures and incidents to OPR/GOR? If GOR has had little impact can you suggest a cause for the apparent decrease?