Using Environmental Assessment to Kick-Start Organisational Environmental Management Systems

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1.0 Introduction

Organisations in the Canadian nuclear industry and other industrial sectors have a strategic opportunity to kick-start the development of an organisational Environmental Management System (EMS) when conducting an Environmental Assessment (EA) for a project. While the two environmental practices differ in their historical development and intent, EA offers complementary concepts and requirements and can produce a significant foundation of baseline environmental information to feed into an EMS development framework. Resources dedicated to the over-all environmental management function within an organisation are thereby deployed more efficiently and effectively.

To build upon this premise for environmental services practitioners, and for environmental management of nuclear organisations in Canada, the following examines strategic points of commonality between the practices of EA and EMS development, and offers recommendations for integrative practical implementation.

2.0 Background

Environmental Assessment is a planning tool used assess the potential environmental and socio-economic effects of a development initiative before irreversible actions are taken (World Bank, 1991). Environmental Management Systems are part of an organisations overall management system that enables achievement and improvement of environmental performance (Harrington and Knight, 1999).

Currently, linkages between the practices of Environmental Assessment (EA) and Environmental Management System (EMS) development in Canada are poorly developed. To examine one linkage, EA Follow-Up activities are a component of EA to be carried out during the post-approval phase of a project. EA Follow-Up activities represent an opportunity to integrate the results, recommendations, and conditions of approval of an EA within the overall organisational environmental management of the proponent firm.

Based on sample data assembled for the 5-Year Review of the Canadian Environmental Assessment Act (CEAA), only about one half of EAs conducted annually under the Canadian Environmental Assessment Act offer any description of post-approval Follow-Up activities. The study also notes that Follow-Up programs that have been defined for CEAA Screenings and Comprehensive Studies have been perfunctory, and for the most part inconsistent in design, implementation, and review (CEAA, 1999). At best, these findings leave stakeholders with the impression that the verification of predictions, evaluation of effectiveness of mitigation measures, and other lessons learned from

having conducted an EA for a project have been lost or deemed unimportant. At worst, stakeholders are left to believe that within the Canadian EA process, the discussion of environmental factors is concluded once the EA and project are approved. In effect, EA becomes a regulatory requirement divorced from environmental management.

3.0 Commonality - EA and EMS Development Elements

Environmental Management System (EMS) development has achieved a higher profile over the past decade due to the development of the internationally recognised ISO 14000 series of standards, and due to the continued success of other programs such as Responsible Care in the chemical industry (Harrington and Knight, 1999; King, 2000).

The ISO 14001 EMS specification requires an organisation to develop a fully integrated system of planning, implementing, checking and correcting, and regularly reviewing its framework of environmental management (See Figure 1). This includes setting out an environmental policy to clearly outline commitments to meet legal obligations, prevent pollution, and continual performance improvement. It requires the organisation to inventory its environmental aspects (interactions with the environment from its activities, products, and services) and to identify its legal requirements and other commitments. It calls for the organisation to outline objectives and targets to set goals for continual environmental performance improvement, and to develop environmental management programs to manage the environmental aspects under its control or influence. Organisational structures and accountabilities and support functions such as training programs, communication methods, document control systems, and emergency response are to be spelled out.

The ISO 14001 elements also include Operational Control. This element requires the organisation to develop sufficient preventative work procedures and other mechanisms to implement the environmental management programs and to prevent deviation from the organisation's policy, objectives and targets. Checking and Corrective Action elements of the standard require the organisation to regularly monitor and measure its facility components (e.g., equipment) and activities that may have a significant impact on the environment; to regularly self-assess regulatory compliance; to manage records for ease in retrievability; to take actions to correct and prevent deviations from operational controls, objectives and targets; and to develop an auditing mechanism to provide ongoing assurance. Finally, to reaffirm commitment and monitor overall progress toward continual improvement at the strategic level, the EMS is to be reviewed regularly by top management regarding its adequacy, suitability, and effectiveness.

Figure 1 The Continual Improvement Loop

Environmental Assessment also offers complementary concepts and requirements which follow a plan, implement, check and correct process flow, though the main emphasis in theory is on planning before irreversible design and "shovel in the ground" decisions are made. The information generated from the EA process flow can feed into the EMS development effort, thus providing an organisation going through an EA process with a significant opportunity to feed into an EMS development effort during the post-approval construction and early operations time period.

Table 1 identifies the key areas of commonality, both in terms of concepts and requirements, between key elements of EA and EMS development.

4.1 Planning

As illustrated in Table 1, the planning elements of an environmental assessment process are comparable to those undertaken to plan out the scope and foundations of an EMS. Both processes require strategic environmental planning and decision making by top management within the organisation to kick-start the process.

In the case of EA, this usually commences with decision making to undertake a project based on a business need or opportunity. The manner in which an EA is viewed and approached as a decision making tool is an expression of business values with respect to the environment. The key question here being, "Is the EA only to identify mitigation measures for the effects of a previously decided upon technology/facility arrangement, or is the EA a planning tool to identify and decide upon a preferred technology/facility arrangement among alternatives?" Typically, the more an organisation has put environmental issues among its higher corporate priorities and integrated them within overall business management, the higher the chance the latter view of EA as a planning tool will be exercised.

In the case of EMS development, the process usually starts with capturing business and environmental strategic values in the form of an environmental policy statement to express commitment and to set direction for environmental business planning.

From here onward, the concepts and requirements of EA and EMS development show a significant commonality, in that common tasks and methodologies are employed. Both processes require the identification of all foreseeable environmental aspects and their corresponding environmental effects. This occurs through use of established methods such as reviewing baseline environmental data sources, existing effects reports, technical drawings and process descriptions, developing effects matrices, examining life-cycle assessments and other comparable case study data.

Both processes then require a rationalisation and assessment step to establish the scope of effort and to focus or prioritise issues to manage the workload. In the case of EA, this commences during the Scoping phase and carries on through to the Assessment and Determination of Significance phases, while in EMS it occurs by developing and following procedures to determine the significance level of environmental aspects. Both processes require consultation with stakeholders at this phase, though the scale of effort may vary considerably. Both processes would look at existing and forthcoming legal requirements and corporate commitments, as well as effects

Table 1 Commonalities in Concepts and Requirements: Environmental Assessment (EA) and Environmental Management Systems (EMS) Development

Environmental Assessment Process Components	Commonalities	Environmental Management System Elements
Planning		
Project Need **Address of Alternatives**	**Decision Level:** ♦ Strategic Environmental Management (SEM) ♦ Defined by top management within the organisation **Tasks:** ♦ Defining/aligning business & environmental values ♦ Decision making based on business values and drivers, as well as the financial, human, and technical resources available ♦ Business case comparisons of alternatives ♦ Lay groundwork for performance measures **Skills Required:** ♦ Business acumen; environmental leadership; holistic strategic thinking	**Environmental Policy** **Environmental Performance Objectives and Targets**
Scoping **Baseline Environmental Studies** **Effects Assessment** **Identify Mitigation** **Determination of Significance**	**Decision Level** ♦ Operational Level decisions ♦ Project/Middle Management/Environmental Services **Tasks:** ♦ Define the spatial and temporal scope of the study/system ♦ Identify and prioritise issues to determine what needs to be managed (EMS) or studied further and managed (EA) ♦ Examination of evidence/data against legal and other criteria to clarify understanding of the issues, and to determine significance/high priorities based on risk to organisation and the environment ♦ Initial definition of mitigation/management strategies/programs **Skills Required:** ♦ Ecological/socio-economic/health physics or toxicological expertise ♦ Communication ♦ Expertise in “process” ♦ Risk assessment ♦ Multi-disciplinary, integrative thinking	**Environmental Aspects Identification and Determination of Significance** **Legal and Other Requirements** **Environmental Management Programs**
Implementation		

Mitigation	**Decision Level** ♦ Operational/Facility Level ♦ Environmental Services/Supervisors/Working Level **Tasks:** ♦ Execute mitigation measures ♦ Implement procedures/measures to execute the mitigation plans/management programs **Skills Required:** ♦ Ecological/socio-economic/health physics or toxicological expertise ♦ Communication ♦ Expertise in "process" ♦ "Hands-on" environmental technical expertise	**Operational Control**
Checking and Corrective Action		
EA Follow-Up	**Decision Level** ♦ Operational/Facility Level ♦ Environmental Services/Supervisors/Working Level **Tasks:** ♦ Monitor and measure key characteristics of the organisation/project activities that can have an effect on the environment ♦ Continue to implement procedures/measures to execute the mitigation plans/management programs ♦ Verify effects predictions and that mitigation/management mechanisms are having the desired effect ♦ Correct deficiencies following discovery; prevent recurrence ♦ Verify conformance of the system to planned arrangements (organisation "walking the talk") **Skills Required:** ♦ Ecological/socio-economic/health physics or toxicological expertise ♦ Communication ♦ "Hands-on" environmental technical expertise	**Operational Control** **Monitoring and Measurement** **Corrective Action** **Auditing**

assessment criteria such as frequency, duration, magnitude and extent, reversibility, and the sensitivity of the existing project or organisational environment when assessing significance and priority of issues for management. As well, both processes may incorporate the above criteria into some level of risk assessment to determine which issues are priority issues. A key difference is that EA would typically move on to conduct some primary research on key issues to clarify their level of significance, while EMS development would most often rely on existing data at hand.

Planning in both EA and EMS would then concentrate on definition of mitigation measures. For progressive EA practice, this commonality would hold true for defining and developing environmental management strategies, plans, or programs as well. In both cases, the key considerations taken into account are the level of priority/risk of the environmental aspects to be managed, the time-frames involved, as well as the human, financial, and technological resources available to carry the measures out.

In EA, the planning phase typically comes to a conclusion once regulatory approval is achieved. Unfortunately, this is often followed by a recurring phenomenon – one which has revealed itself too often since EA practice commenced in the early 1970s – the post-approval decrease in momentum and interest among all parties involved in the process in terms of following through on environmental management, especially if resources allocated were exhausted in the effort to achieve approval (Schindler,1976; Canter and Sadler, 1997).

4.2 Implementation

As illustrated in Table 1, the Implementation elements of EA - typically physical, technological and/or compensatory mitigation and monitoring measures - are comparable to those undertaken to execute the operational controls implementing environmental management programs in an EMS. Both require balancing of available human, technological, and financial resources, and involve activities dedicated to preventing or managing effects on the environment.

In progressive EA practice (e.g., that required more recently by the World Bank), the mitigation and monitoring measures may be framed within an Environmental Management Plan for the project (Doran, 1999). In EMS, they are operational controls and monitoring and measurement activities centred on prevention of environmental effects and deviation from objectives and targets.

Implementation in both practices require “hands-on” skills in at least the areas of the bio-physical environment, socio-economic environment, human health, and communications (CCHREI, 1999).

4.3 Checking and Corrective Action

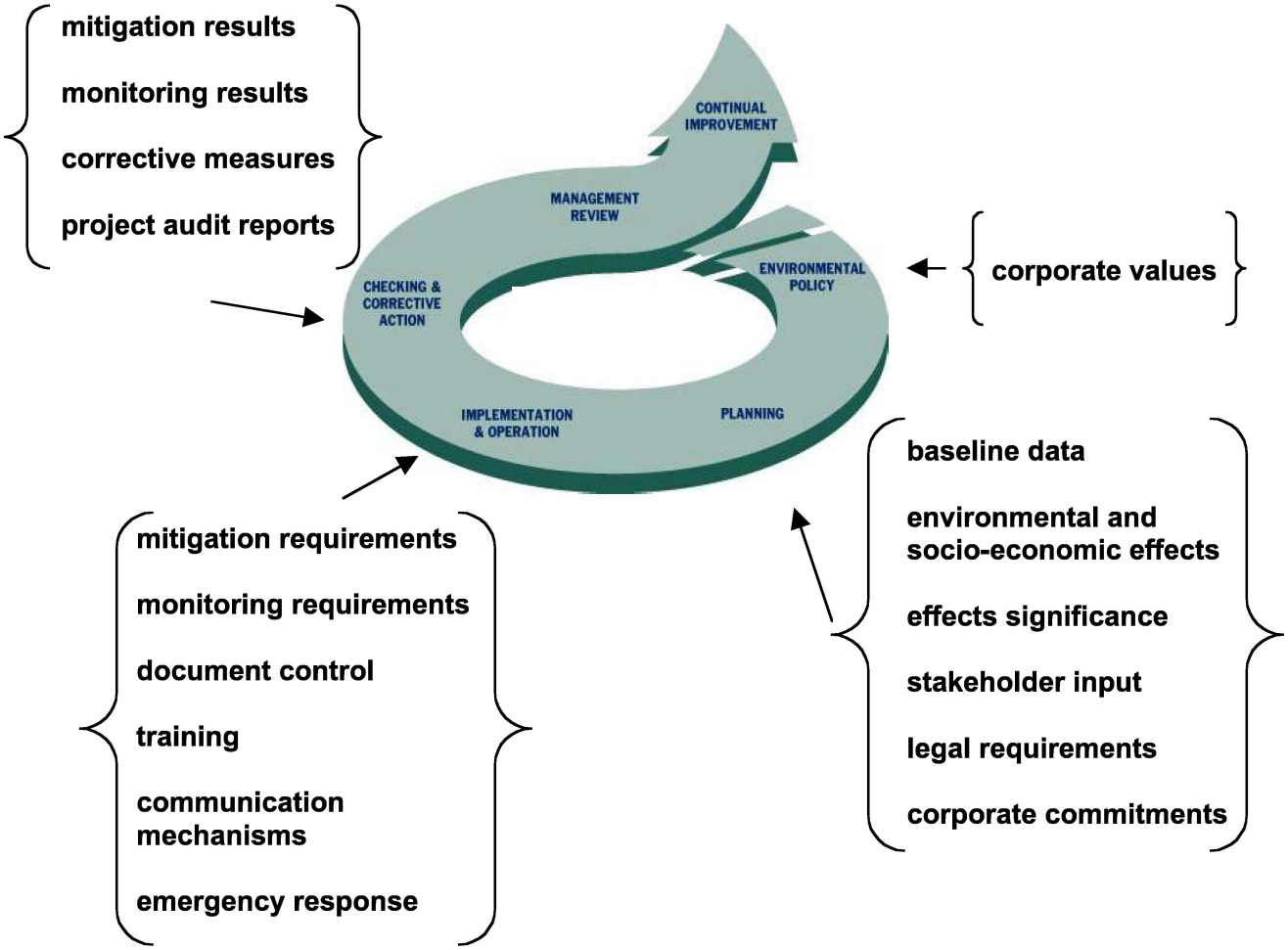
It is in the area of Checking and Corrective Action that the link between EA and EMS holds the most opportunity for an organisation to maximise use of the information generated during an EA process to strengthen or kick-start its EMS development effort. A well developed program of environmental management in the post-approval phase of an EA, whether it is termed “EA Follow-Up”, “post-approval monitoring”, or more

common internationally, an “Environmental Management Plan,” can lay the groundwork for an EMS on a greenfield project, or kick-start the process of formalising an EMS at an existing facility.

For both EA and EMS, this would include defining the tasks, accountabilities, and timeframe for follow-up activities, developing monitoring procedures or measures to verify effects predictions, to examine the effectiveness of mitigation measures or management procedures to see whether they are having the desired level of effectiveness in preventing (outright), controlling (ameliorating), or managing pollution (dealing with what cannot be controlled). It would also include procedures for correcting deficiencies following their discovery, and preventing their recurrence. A well developed Environmental Management Program may also include a mechanism for periodic audit. This would be an essential component for an EMS to verify conformance of the system to planned arrangements (organisation “walking the talk”).

Figure 2 illustrates how the information generated from an environmental assessment of a project can feed into an EMS development effort.

Figure 2 Information Contribution from EA to EMS



Environmental Management Plans are a common requirement of many progressive EA jurisdictions internationally, and to the directives of international financing agencies such as the World Bank. An Environmental Management Plan would concentrate on management of the most significant impacts during the project life cycle, rather than spreading EA financial and human resources too thin in an effort to manage all conceivable effects/concerns.

5.0 Other EMS "Kick-Start" Opportunities From EA

Aside from the common concepts and requirements outlined in Table 1 and EA information inputs to EMS development illustrated in Figure 2, there are other EA process components that can assist in development or strengthening of an EMS.

Public participation is a key component of EA. Development of the EMS can therefore build on these efforts to address the communication requirements for the EMS of the operating facility. Tools, techniques and processes such as newsletters, regional/municipal government liaison, community liaison groups, public information centres can be continued or modified as required.

Similarly, emergency preparedness and response plans and procedures developed for an EA to address abnormal events, document control and records management procedures started with EA, as well as training procedures developed for the EA can all lay the foundation for developing these EMS requirements for an organisation, or strengthen existing programs in these areas.

6.0 Conclusions

Environmental Assessment offers several complementary concepts and requirements which can feed into the EMS development effort. Key common concepts and requirements include:

- strategic environmental planning and decision making by top management within the organisation to kick-start the process, to express corporate values in a policy, or through commitment to a project undertaking based on a business need or opportunity;
- identifying and prioritising issues to determine what needs to be managed (EMS) or studied further and managed (EA);
- examination of evidence or effects data against legal and other criteria to determine significance and high priority areas based on the risk to the organisation and the environment;
- definition and development of mitigation measures, strategies, and operational controls to prevent, control, or manage pollution/mitigate adverse environmental effects; and,
- definition of checking and corrective activities: to verify effects predictions, to examine the effectiveness of mitigation measures or management procedures for pollution prevention, to correct deficiencies and prevent their recurrence, and where available, to make use of audit results.

Further linkage and integration of the practices of EA and EMS development to take advantage of these commonalities would position EA more appropriately as a planning tool within the larger environmental management framework for an organisation.

These commonalities present significant opportunities for organisations in the Canadian nuclear industry and other industrial sectors to make more effective use of the information generated by an Environmental Assessment process to develop or strengthen their EMS frameworks.

7.0 References

Canadian Council for Human Resources in the Environment Industry (CCHREI)(1999) national Occupational Standards (NOS): University Level Occupations. www.cchrei.ca

Canadian Environmental Assessment Agency (1999) Canadian Environmental Assessment Act Five Year Review: Discussion Paper for Public Consultation. December 1999.

Canter, L. and Sadler, B. (1997) International Study of the Effectiveness of EA . EGWI, IEA, IAIA. June 1997.

Doran, L. (1999) EA at the Centre: A View of Environmental Assessment at the World Bank Group. Paper presented at the Ontario Association for Impact Assessment Annual Conference. May 1999.

Harrington, H.J., and Knight, A. (1999) ISO 14000 Implementation: Upgrading Your EMS Effectively. New York: McGraw Hill.

King, P. (2000) Gaining Competitive Advantage Through Environmental Management. Environmental Management. Air and Waste Management Association. January 2000. pp. 24-25.

Schindler, W. (1976) The Impact Statement Boondoggle. Science, Vol. 192, No. 4239, p. 509.

World Bank (1991) EA Sourcebook. Vol. 1 Policies, Procedures, Cross-Sectoral Issues. Environment Department. World Bank Technical Paper Number 139. 1991.