

# **IOC – SafetyNet Project**

## **Final Report**

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## **I. INTRODUCTION AND OVERVIEW**

Between the summer of 2006 and the winter of 2007-8, the SafetyNet research team of Memorial University worked with the United Steelworkers national office, the union's local at the Iron Ore Company of Canada's Labrador City operations, and the company's managers to develop and pilot-test an innovative approach to evaluating occupational health and safety management systems (OHSMS), the complex collection of rules, procedures and standards that many large companies use to coordinate their occupational health and safety programs. The project started from the premiss that, just as many of these management systems are purchased off-the-shelf from specialized suppliers and consulting firms rather than being developed in-house and tailored to local conditions and structures in the specific workplace, the methods used to evaluate the performance of these management systems is more often than not just as standardized. We were convinced that these standardized evaluation modules were very much 'tick-the-boxes' audits or management reviews focusing primarily on whether specific procedures, rules and documents existed rather than on how the management system was actually working to improve health and safety.

Together with our parties at IOC and the USW, we designed and implemented a process for the workplace parties at IOC to build their own, tailor-made, evaluation tool focusing on issues judged to be of special interest at the workplace and to pilot test this approach to produce both an initial assessment of how IOC's HSMS was functioning and a new tool that could be used both at IOC and at other similar industrial firms to provide a collaborative process and a powerful, locally sensitive evaluation tool for OHSMS to be used either instead of, or as a supplement to, conventional audits and management reviews.

The following report describes in some detail, the unfolding of this project. We describe the collaborative process and the pilot test in some detail, with a number of appendices to document how things were done. We present the evaluation tool that we produced - a site-specific evaluation tool for IOC using document analysis, an employee survey and a set of focus groups to examining 35 indicators linked to five key 'success factors'. And we also present the results of the pilot evaluation of IOC's HSMS done in October, 2007 which set out those indicators on which IOC seemed to be strong, areas needing improvement, and others where further discussions between the workplace partners seemed warranted. In the concluding section, we present a few comments from the research team on the strengths and weaknesses of our work at IOC as well as on ways in which the process could be improved and simplified for future use at IOC and elsewhere.

## **II. THE SAFETYNET RESEARCH PROGRAM AND WHERE THIS PROJECT FITS**

The research project done at IOC in Labrador City is one among nine studies on occupational health and safety in Atlantic Canada that constituted the original research program of the 'SafetyNet' research group. This program was based on a successful application for funding to the Canadian Institutes of Health Research (CIHR) by a team led by Dr. Stephen Bornstein and Dr. Barbara Neis of Memorial University. Bornstein and Neis applied for a five-year grant of \$2.4 million to a new CIHR program called 'Community Alliances for Health Research.' What made this program unusual was that 'community partners,' that is, non-academic groups such as provincial government agencies, societal stakeholders and charitable organizations, were to be full partners in all stages of the research from the original design of the application, through the performance of the research, all the way to its dissemination. Bornstein and Neis put together a team of over 30 researchers, not only at Memorial but across the Atlantic region and at universities in other parts of Canada, in the United States and in Europe plus over 40 community partner organizations including the Workplace Health, Safety and Compensation Commission of NL, the Department of Labour and the Environment, the NL Federation of Labour, and several private firms. The team's application was one of the 19 that were chosen for funding across Canada.

The nine studies in the SafetyNet program all focused on occupations and economic sectors that were prominent in the marine and coastal areas of Newfoundland and Labrador and in Atlantic Canada more generally. They included four projects in the fisheries sector, three in the oil, gas and minerals sector, and three on work in cold/harsh environments. All the projects were designed to address pressing, practical issues in occupational health and safety by undertaking research whose findings could then inform public policy as well as practice in the region's workplaces.

As originally conceived, the current project was to be undertaken in the oil and gas sector and was to examine health and safety management in a petroleum refinery. The original project, designed in collaboration with the local union and senior management, never got off the ground. Instead, at the suggestion of the national office of the United Steelworkers, the focus was shifted to a different plant—Iron Ore Corporation's mine and mill in Labrador City—whose workforce was also organized by the union and whose senior management was eager to participate in research. The idea was to study the way formal health and safety management systems—the detailed handbooks of objectives and procedures for occupational health and safety that govern activities in many large plants—are actually implemented in practice and to study ways in which this implementation might be evaluated and improved in specific local environments involving complex work and aging installations similar to the IOC Labrador City site.

### III. THE MOTIVATION FOR THIS PROJECT

The redesigned project was based on the understanding that even the best workplace occupational health and safety management systems (OHSMS) need to be reviewed and evaluated on a regular basis and that this evaluation should be based not only on standard, off-the-shelf audit methods but also on the specific experience and ideas of a company's employees and employers. Apart from the idea that continuous improvement is part of managerial best practice, international research indicates that there are important success factors that are often missing in well-established OHSMS, as shown in the literature review below. Also, this review concludes that senior management commitment and comprehensive employee involvement are so important that some scholars argue that they are essential preconditions for effective OHSMS. Thus, the general purpose of the project was to study the use of consultative processes involving researchers, employees and employers to develop an evaluation tool for assessing the design and effectiveness of specific OHSMS. The original intention was to include two case studies, or pilot projects, of this collaborative process and the United Steelworkers union was interested in being part of such a project in two workplaces in the province where they represented employees. However, after a period of discussion and consultations with two organizations, one company, IOC, agreed to participate in the project. Consequently, the partners participating in the study were SafetyNet, IOC, and United Steelworkers Local 5795, with the support and input of their National Department Leader for Health, Safety and the Environment. The objective was to develop and pilot-test at IOC a consultative process in which the company's workers and managers could, with the help of discussions with SafetyNet researchers and international experts, develop an innovative evaluation process and tool attuned to the specific features of the company's OHSMS but capable of being reconfigured for application in other workplaces. The objective at all times was two-sided, both general and specific: to develop a general method for the collaborative evaluation of OHSMS that could be used at any number of firms and to pilot test that method at IOC, giving employees and managers at Labrador City a new and, we hoped, informative view of the way their company's safety system was functioning.

### IV. THE BASIC DESIGN

Methodologically, although multiple case studies allow a stronger comparative analysis and more robust conclusions, single cases are recognized in the literature as valid and as offering rich opportunities for learning and understanding, as opposed to generalization (Stake 2000). The theoretical basis of the collaborative, consensus-building methodology used in this study is derived from O'Sullivan's concept of "collaborative evaluation" (2004, page 24), which is explained further in **Appendix A** (IOC Workplace Data Report). The project's basic design was a "participatory action" approach—the researchers and the IOC stakeholders would work together to develop a method for designing a tool for evaluating health and safety management systems and this draft tool would be pilot-tested at IOC. The researchers would spend a considerable amount of time at the Labrador City plant, and IOC managers and employees would devote a significant amount of time and effort working with them to develop the tool, pilot test it, and assess it.

The key people involved were to be: the research team (Susan Hart and Stephen Bornstein of Memorial and their research assistants), IOC's General Manager, Environment, Safety and Health (a position held by three different men over the course of the project, Greg Sinclair, Phil Turner and Michael Tost), George Kean, the President of the United Steelworkers' Local 5795, the United Steelworkers' National Department Leader for Health and Safety and the Environment, Andrew King, the two Joint Occupational Health and Safety Committees at the Labrador City plant, and an external research adviser, Dr. David Walters of Cardiff University, an internationally prominent expert in research on occupational health and safety systems and processes.

After preliminary discussions among the research team and its partners, a basic outline of the process that would be involved in the project was developed. It involved the following eleven steps:

1. negotiation of a Memorandum of Understanding between the partners to govern the study
2. drafting of a basic research protocol and timetable by the research team and its approval by the partners
3. a review by the research team to examine the literature on OHSMS and the factors that made some more successful than others
4. workplace consultation through interviews and focus groups to examine the relevance and relative importance of the success factors uncovered in the literature review
5. investigation by the research team of potential performance indicators for each success factor identified in the literature review and the consultations
6. first workshop (researchers, partners, international adviser) to seek consensus on the success factors to be included in the evaluation tool as well as on performance indicators to be used for each success factor
7. further development of the tool by the research team in consultation with IOC partners
8. a pilot study of evaluation tool on site at IOC
9. analysis and write-up of the pilot study by the research team
10. a final partners' workshop to review and refine the piloted evaluation tool and assess the potential of the process and the evaluation tool for use elsewhere
11. feedback and dissemination by partners and the research team

Many of these steps would be essential in any new application of the approach we developed at other workplaces. Some, as we will see at the end of this report, could be accelerated or blended with other steps or, in some cases, skipped entirely. We will begin by describing in some detail how each of these steps was carried out at IOC and then turn to a review of the process as a whole and some reflections about how it could be streamlined and improved for future use.

## **V. THE PROJECT, STEP BY STEP**

### **1. Negotiation of a Memorandum of Understanding for the Project**

An initiative of this sort in occupational health and safety research generally requires a formal agreement between the parties and IOC was no exception. Despite the manifest goodwill of all the parties involved (the MUN research team, IOC management, and the local and national unions), the MOU took a surprisingly long time to draft, revise and sign. The drafting was done by IOC lawyers with input from the other partners and their legal advisers. Much of the challenge derived from the novelty of the project (the 'community alliance' structure, the participatory action approach, the combination of onsite and offsite work, uncertainties about how and where the evaluation tool might be used in the future, etc.) as well as the fact that none of the partners had previously participated in anything similar. Much of the work was done by e-mail and teleconference but a face-to-face meeting in St. John's was also involved. The ultimate product was an innovative document that provided all the signatories with comfort about issues of access, privacy, confidentiality, and intellectual property. The MOU (see **Appendix B**) has already been used by SafetyNet as a template for agreements on other collaborative research projects such as a data sharing agreement with the WHSCC of Newfoundland and Labrador in the area of fishing vessel safety.

### **2. Drafting and Adoption of a Research Protocol and Timetable**

Based on the terms of reference in the MOU, the research team then proceeded to draw up a protocol for the project including a list of the key steps to be taken, objectives and methods for each step, and an estimated set of timelines. The protocol and timelines were discussed in several team conference calls, revised several times and then adopted. During the rest of the process, the basic outline of steps proved to be robust, although some of the methods needed to be modified as the project proceeded, and the timelines needed to be reworked several times. Given the novelty of the work and the participatory action research method chosen, the need for flexibility and patience was not a surprise to most of the participants.

### **3. Literature review to identify Success Factors and to draft a preliminary evaluation tool**

The research team started the ball rolling for the project by doing a comprehensive review of recent literature on OHSMS. The purpose of this review was to provide a solid foundation for the proposed evaluation tool by identifying the elements that were seen to be important and/or controversial in management systems and presenting them to our workplace partners as an initial menu of items for possible inclusion in our evaluation tool and our evaluation process.

## *The Development of OHSMS*

Over the last decade, the trend toward the use of OHSMS has been mostly evident in large multi-national corporations but it has spread increasingly to other firms both privately and publicly owned (Frick and Wren, 2000). Although definitions of an OHSMS vary somewhat, Gallagher, Underhill and Rimmer (2001) recommended a fairly broad one derived from their research and reflecting the notion of interdependence: "...a formalized management system to improve occupational health and safety, comprising a complex set of inter-related elements" (page 8). Gallagher et al. (2001) characterized the typical OHSMS as including sections on Organization, Responsibility and Accountability (senior management involvement, line manager/ supervisor duties, management accountability and performance measurement, occupational health and safety [OHS] policy); Consultative Arrangements (employer and employee OHS representatives, issue resolution, joint OHS committees, broad employee participation); and Specific Program Elements (OHS rules and procedures, training programs, workplace inspections, purchasing and design, and emergency procedures).

The international diffusion of OHSMS can be attributed to the interaction of various factors. Reforms in health and safety policies in the 1970s and early 1980s in many industrialized countries did not bring the expected improvements; investigations in the 1980s into disasters, such as several offshore oil tragedies in the North Sea and the Bhopal chemical leak in India pointed to poor management systems; quality control theory and practice were extended to occupational health and safety; systematic health and safety management was increasingly mandated by the state, for example, in Norway and the UK; and OHSMS were adopted by many medium and large companies in high-risk industrial sectors such as the nuclear and oil industries (Frick and Wren, 2000).

Even though the literature reveals a number of different typologies of OHSMS (Gallagher et al., 2001), these can be grouped into a broad dichotomy of "Safe Place" versus "Safe Person" models (Gallagher, 2000, page 8; Frick and Wren, 2000, page 27). The characteristics of a "Safe Place" OHSMS emphasize the proactive and vigilant management of hazards; senior management commitment to participation by safety representatives in system planning, implementation and review; and employee involvement in special OHS initiatives. This model is often found in state-regulated OHS frameworks (Frick and Wren, 2000; Gallagher, 2000). In contrast, the "Safe Person" OHSMS focuses on risky individual behavior (Nielsen, 2000) and the prevention of unsafe acts through training, peer pressure and co-worker surveillance. This model downplays the role of safety representatives and joint OHS committees in identifying and controlling underestimated or unknown hazards (Bonde, 1994; Frick and Wren, 2000; Nichols and Tucker, 2000). In addition, there is less emphasis on engineering out workplace hazards or redesigning work processes (Frick and Wren, 2000; Nichols and Tucker, 2000), and a downplaying of the impact of organizational factors such as production pressure, labour processes, and new patterns of work on OHS (Nichols and Tucker, 2000; Shaw and Blewett, 2000; Walters and Frick, 2000; Woolfson, Foster and Beck, 1996). The commercial OHSMS that are available for purchase tend to emphasize the "Safe Person" approach.

## ***Effectiveness of OHSMS***

In 2000, Frick et al. expressed surprise at the lack of critical assessment of the effectiveness of OHSMS, considering the latter's evolution as the leading international strategy for reducing the risk of accident and illness. Their edited collection of papers

addressed that gap in the literature. Since then, subsequent research commissioned by the Australian National Occupational Health and Safety Commission (NOHSC) included an international review of the literature and an Australian study (Gallagher et al., 2001). These two major publications represent an important contribution to a growing literature on OHSMS. Interestingly, before this body of literature had appeared, Ryggvik's 1998 study of safety in the Norwegian offshore oil and gas industry had concluded that the emphasis in Norway's safety regime on quality-based safety management systems was a clear advantage regime over the more ad hoc approach evident in much of the high-risk offshore oil and gas industry at that time. Moreover, he included the development of OHSMS in Norway's oil and gas industry as one of three pillars of the strength of the Norwegian model. The other two pillars were identified as the strong, independent offshore regulatory body with its internal control requirements, and the country's progressive legislation on working environments that empowered safety delegates and working environment committees.

Moving to North American research, Wokutch and VanSandt (2000) reviewed the operation and effectiveness of what they call "the Du Pont model" and "the Toyota model" and concluded that "available evidence suggests that these approaches are both effective, particularly in terms of reducing workplace injuries" (page 367). Also, the extensive research conducted for the NOHSC (Gallagher et al., 2001) suggested that "OHSMS can deliver more healthy and safe workplaces under the right circumstances" (Executive summary, page vii). During this NOHSC study, expert consultation and indirect evidence revealed examples of successful OHSMS, and Gallagher's Australian research (2000) provided evidence of superior OHS performance in firms with OHSMS featuring a dominant "safe place" control strategy and an "innovative management structure and style" (cited in Gallagher et al., 2001).

Notwithstanding this acknowledgement that OHSMS can result in the improvement of health and safety at work, it is significant that all the research sources noted above qualify their statements of support for OHSMS with recognition of problems, reservations, or preconditions for their success. For example, Ryggvik referred to Norwegian research revealing that while an OHSMS may appear appropriate on paper, it can be significantly less effective in practice (1998), a point echoed by Gallagher et al. (2001) who warned about "paper compliance" (page 1) and by Frick, Jensen, Quinlan and Wilthagen (2000) in their "paper tiger hypothesis" (page 4). These apprehensions rested upon the extensive documentation required to demonstrate the process of management and the overriding concern of some managers to pass "tick the box" type audits to the detriment of more central OHS activities such as hazard identification and control (see, for example, Hopkins 2000) or worker involvement in safety planning, implementation and review (Frick and Wren, 2000; Nichols and Tucker, 2000). Moreover, despite Wokutch and VanSandt's overall endorsement of the move to OHSMS (2000), they did acknowledge some serious criticisms of the behavioural orientation of both the Du Pont and Toyota models studied in their research. These included the shift away from a focus on unsafe and unhealthy working conditions towards an emphasis on workers' behaviour (in other words, a safe person rather than a safe place approach), the negative effect of behavioural-based incentives, and a neglect of longer-term occupational health (as distinct from short-term safety) issues.

Thus, the literature reveals a number of concerns about the current use of OHSMS. Placed in a constructive context, these problems, failures or gaps can potentially be



addressed by proactive approaches in the workplace and they can arguably be construed, in positive terms, as success factors. The following section reviews these factors, categorized into the main themes highlighted in the literature:

- senior management commitment;
- worker participation;
- proactive hazard management;
- incorporation of organizational factors through the integration of OHS with other management systems;
- targeting occupational illness as well as shorter-term safety outcomes; and
- broad-based auditing.

We developed this categorization is for analytical purposes only; as the reader will understand, some of these themes overlap or are in practice mutually reinforcing, and all of them are to some extent inter-connected.

#### *Senior Management Commitment*

Gallagher et al. (2001 and 2003) identified this as one of the most important success factors, even a pre-condition, for effectiveness. They emphasized the important role of leadership by example (see also Workutch and VanSandt, 2000), and envisaged this level of commitment as consistent with their recommendation of an “adaptive hazard manager”, who combines an innovative approach with a thrust towards ensuring a “safe place” to work (2001, page 9), and with Hopkins’ idea of “organizational mindfulness” (page 139), where a manager continually searches out possible hazards, scanning the environment for learning opportunities and always being alert for unexpected events (2000). Some indicators of commitment include the provision of a sufficient budget for a proactive OHSMS, empowerment of independent health and safety personnel, safety representatives and joint OHS committees, ensuring open communication, and requiring management accountability for OHS to the same degree as for production and quality (Gallagher et al., 2001).

#### *Worker Participation*

Seen as benefiting OHSMS through the incorporation of workers’ knowledge and experience in addition to a role as monitors (Frick and Wren, 2000; Gallagher et al., 2001 and 2003; Walters, 2003; Walters and Frick, 2000), this factor is also highlighted by Gallagher et al. (2001) as a pre-condition for success, along with senior management commitment. They devised a continuum of worker participation ranging from what they called management-driven (provision of safety education), participative (worker involvement in safety inspections and quality circles), directly influential (safety representatives or OHS committee members), to the highest level (representatives and committee members participating in planning, implementation and review of OHS activities).

#### *Proactive Hazard Management*

Gallagher (2000) and Hopkins (2000) stressed the need for managers who are proactive and constantly alert to potential hazards and unexpected events. Based on his analysis of an Australian Esso gas plant explosion, Hopkins concluded that there was a danger of hazard management being downplayed in favor of maintaining an OHSMS as an end in itself combined with a determination to change workers’ behaviour. At the gas plant, this resulted in distraction from identifying, reporting and controlling major operational

hazards, which ultimately led to the explosion (Hopkins, 2000). Other literature points to the need for a risk assessment process that takes account of the potential influence on risk perception of socio-economic, political or cultural factors. Analysis of the NASA Challenger disaster has revealed the strong impact on perceptions of risk of the push towards the commercialization of the shuttle program (Casamayou, 1993), and the evolution of an organizational culture that generated the development of what was seen by NASA engineers as an acceptable risk in the launch process that was in fact a major hazard that caused the tragedy (Vaughan, 1997). Moreover, an OHSMS should build in controls to prevent taking excessive risk and ignoring known safety hazards, as shown by analysis of the Westray mine disaster (Richard, 1997).

#### *Incorporating Organizational Factors through Integration with Other Management Systems*

Although the literature sometimes separates these two aspects, here they are merged because it is argued that in order to properly integrate management systems with OHS, it is essential to build in organizational factors, resulting in a much broader concept of integration of management systems than is usually evident in current OHSMS. It is clear that sufficient priority must be given to OHS in relation to other business objectives such as quality of the product or service (see, for example, HSE 1997). But, even if this general requirement is often included in OHSMS, the focus on individual worker behaviour evident in many of them results in the downplaying or exclusion of important organizational factors (Casamayou, 1993; Frick and Wren, 2000; Hopkins, 2000; Nichols and Tucker, 2000; Nielsen, 2000; Ryggik, 1998; Shaw and Blewett, 2000; Walters and Frick, 2000; Wokutch and van Sandt, 2002; Woolfson et al., 1996).

Those organizational factors often ignored include the link between a collaborative industrial relations climate and senior management commitment to independent, worker-centered representation (Nichols and Tucker, 2000); the impact of the labour process, including patterns of work and organizational change, on health and safety (Hart, 2002; Nichols and Tucker, 2000; Woolfson et al., 1996); a broad conception of safety culture as an organizational phenomenon rather than as the product of individual attitudes (Nichols and Tucker, 2000); organizational factors as explanations for workplace accidents rather than the tendency to focus on individual human error (Frick and Wren, 2000; Nielsen, 2000; Nichols and Tucker, 2000); informal work practices, devised by employees as a rational response to an event or situations unforeseen by the designer of the formal rules, as in the circumstances leading up to the Longford gas plant explosion (Hopkins, 2000) and as indicated in the engineers' risk assessment leading up to the Challenger disaster (Vaughan, 1997). Finally, often missing has been a broad interpretation of communication to make possible the capture of some serious defects identified in previous disasters, such as lack of information exchange in between shifts, illustrated by the Ocean Ranger, the Piper Alpha and Longford (Hart, 2000; Hopkins, 2000; Woolfson et al., 1996); ineffective reporting of hazards and near misses, illustrated by the Ocean Ranger, the Piper Alpha, Three Mile Island, Westray, and the Challenger (Casamayou, 1993; Hart, 2000; Richard, 1997; Vaughan, 1997; Woolfson et al., 1996); and failure to heed earlier warnings of disaster, as in the cases of the Ocean Ranger, Longford, Three Mile Island, Westray and the Challenger (Casamayou, 1993; Hart, 2000; Hopkins, 2000; Richard, 1997; Vaughan, 1993), and many other tragedies (Casamayou, 1993).

### *Targeting Occupational Illness As Well As Shorter-Term Safety Outcomes*

Paying attention to the risks of occupational illness was seen by many authors as a crucial success factor (Gallagher et al., 2001). However, current OHSMS tend to be biased towards short-term outcome measures, such as worker compensation and accident records, rather than longer-term health outcomes, such as occupational disease, repetitive strain injuries and workplace stress (Frick and Wren, 2000; Gallagher et al., 2001; Hopkins, 2000; Nichols and Tucker, 2000; Shaw and Blewett, 2000; Wokutch and VanSandt, 2000). This focus was explained in the literature by the relative ease of measuring easily quantifiable areas, such as accident rates, as opposed to a complex set of inter-connected causes of occupational disease and a long period of dormancy before the onset of illness. Interestingly enough, effective worker participation and a strong union has been linked with a higher likelihood of addressing longer-term health hazards (Nichols and Tucker, 2000; Stephenson and Malloy, 2000).

### *Broad-based Auditing*

Apparently, successful audits of OHSMS have sometimes been conducted shortly before fatal accidents have occurred, as at Westray and Longford. These audits clearly failed to capture serious safety problems at these worksites; indeed, in both cases the companies received a safety award a few months prior to the explosions (Hopkins, 2000; Richard, 1997). This apparent paradox has led scholars to highlight some fundamental flaws in most of the available OHSMS audit programs. Problems identified with conventional auditing included a narrow focus on short-term outcomes (such as low accident rates and on passing a tick-box format audit); a lack of emphasis on proactive, vigilant or adaptive hazard management; the failure to recognize that senior management commitment and worker participation are virtually preconditions of successful OHSMS; and a lack of specialized occupational health and safety auditors instead of those with a background in general quality management only (Hopkins, 2000; Gallagher et al., 2001).

Having pinpointed these six key 'success factors' through our review of the literature, we could then begin the workplace consultations that, we hoped, would assess which of these were regarded as essential by our workplace partners at IOC and to refine our understanding of how to study them as they did or did not play out at the mine. An analytic summary of this literature review can be found in **Appendix C** (Summary of Literature Review on Effectiveness of OHSMS).

## **4. Initial workplace consultations: interviews and focus groups**

In June 2005, Susan Hart spent two weeks at the IOC plant in Labrador City doing interviews and focus groups to provide input for the subsequent multi-stakeholder workshop. Dr. Hart interviewed the Environment, Safety and Health General Manager and four other General Managers, the President of Local 5795, three Environment, Safety and Health (ESH) Technicians and the Co-Chairs of the two Joint Occupational Health and Safety Committees (mine and plant). She also conducted eight focus groups: two each for the concentrator, pellet plant and mine, and one each for central services and the summer students. Dr. Hart then analyzed the results of her consultations (tape recordings and notes of the interviews and focus groups) to aid in the development of a proposed list of key success factors to be recommended at the first team workshop for inclusion in the draft evaluation tool. For more information on the methodology used, the findings and the links between the workplace data, the success factors and the objectives of the first workshop, please see **Appendix C** (Workshop Data Report).

## 5. Preparatory work by the research team

The next step in the process took place entirely at the office of the SafetyNet research team in St. John's and was conducted primarily by the team's research assistant, Marlyn Aryan, under the supervision of Dr. Hart and Dr. Bornstein. Its purpose was to prepare materials and methods for use at the upcoming workshop. Her task was to comb the substantial international literature on OHSMS to compile a list of performance indicators and potential measures of them that could be linked to the success factors that had been identified in the preliminary literature review (Step 2) and confirmed as important in the workplace consultations (Step 3). At this stage, the research team also sought to subdivide each of the possible success factors into component factors. This was done in an effort to ensure that all key issues that had been identified in the literature and workplace consultations were covered in the evaluation tool.

## 6. The First Workshop - February 9-10 2006

This workshop was held in Labrador City. Its purpose was to use two days of intensive discussions to work out the basic ingredients of the consensus-based evaluation tool, based on all the input gathered to that point—the literature review, the workplace interviews and focus groups, and a set of sample performance indicators generated by the research team for each of the identified success factors—all processed through the experience and expertise of the workshop participants. Apart from senior representatives of the IOC partners and the SafetyNet research team, participants included the Co-Chairs of the two JOSH Committees at IOC as well as the ESH Technicians. The workshop began with a set of short presentations setting up the discussions. The presenters—researchers from SafetyNet and international expert, Dr. David Walters of Cardiff University—set out the objectives of the workshop, the approach to be used, and an analysis of Canadian and international literature on what factors are common to the most effective OHSMS. An analysis of the workplace data generated by the interviews and focus groups was also presented. Small-group and full-team facilitated discussions followed aimed at reaching consensus on the success factors to be included and their division into components to make possible the design of performance indicators and measures for the evaluation tool. By the end of the workshop, participants had developed the foundation of an evaluation tool with a preliminary consensus on five of the original six success factors divided into components with some matching performance indicators. The five success factors chosen were:

1. employer roles and employee roles (SF1)
2. proactive hazard management (SF2)
3. integration of OHS into the company's overall management approach (SF3)
4. the quality of the OHS management system (SF4)
5. inclusion of long-term health issues alongside safety issues (SF5)

For details on the workshop, its agenda, the background documents used, the presentations that were made, and a summary of the outcomes, see **Appendix D (1-7)**.

## 7. Refining the Indicators and Measures

At this stage, the research design called for the research team to continue the development of the draft evaluation tool for piloting at IOC. They were to do this in consultation with a small Working Group including the General Manager of ESH at Labrador City, the President of Local 5795 and the Department Leader for Health, Safety and the Environment of the USW national headquarters in Toronto. It took the research team and the Working Group until September to turn the results of the workshop into a workable set of pilot project tools. The research team, working on its own and through repeated conference calls with the Working Group, began by working on a revised set of indicators for SF1 and SF3 as well as of suggestions as to how each indicator could be measured in the workplace. The research team experienced considerable difficulty in reducing the number of indicators, even for just these two Success Factors, down to a manageable level. It was not until a pivotal face to face meeting of the research team and the Working Group held in St. John's on August 15-16 that key decisions were taken that solved this problem. This meeting made the following decisions:

- the proposal by the research team to cut the number of indicators down to a manageable number by limiting the pilot study to two Success Factors (SF1 and SF3) was rejected; the Working Group wanted the pilot project to remain comprehensive by covering all five Success Factors
- the number of indicators would be kept down not by excluding Success Factors but rather by two tactics:
  - focusing on innovative indicators derived from the research so far rather than those usually included in standard audits and, specifically, in the audits currently being done at IOC
  - further dividing this reduced number of indicators into two groups: 'core' indicators that were so important and unique as to be needed both in Year 1 and in all subsequent repetitions of the evaluation; and 'rotating' indicators that would be included in one or more subsequent years but not in Year 1.

In addition, this meeting generated a set of proposed indicators, both 'core' and 'rotating' for the remaining Success Factors (2, 4 and 5). The result, summarized in **Appendix E1** (SafetyNet/IOC Workshop ... St. John's, August 15-16, 2006), was an evaluation tool with total of 84 indicators.

A follow-up conference call on August 24 put the finishing touches on the process.

- The 'core' and the 'rotating' indicators for all five Success Factors were reduced to a total of 62. Of these, 35 were selected as 'core' indicators that would be included in the pilot project as well as in subsequent iterations and the others were designated as 'rotating' indicators that would only be used in later years.
- Agreement was also reached on how each of the core indicators would be measured. There would be three measurement techniques: the analysis of company documents, a question or questions in the employee survey and discussion in focus groups. The decision about which measurement or combination of measurement techniques to use for each indicator was based on a discussion of the nature of each indicator. In particular, what mattered was the

- extent to which it involved the existence of a policy or procedure or the extent to which a policy or procedure was actually implemented in practice and/or seen to be effective in producing desired outcomes.
- Methods for tabulating scores for each indicator on the basis of these measures were discussed and clarified.
- At the end of this conference call, all the key decisions had been made about the content and methodology of the pilot evaluation project. The outcome is presented in **Appendix E2** (Success Factors 1-5, Version 5, August 24).
- Dates were also set for the testing of our instrument via the pilot project at Labrador City: October 10-13.

The research team then spent the month of September giving substance to the decisions of the two August meetings. A revised questionnaire was developed and pre-tested covering all five Success Factors. The research team also developed a guide for the focus groups and ensured that each focus group would discuss issues related to every one of the five Success Factors. Ethics approval was obtained from the Interdisciplinary Committee on Ethics in Human Research at MUN for the survey instrument, for the focus group guide and process, and for the pilot study as a whole. Finally, discussions were held with the Working Group to select the company documents needed to measure IOC's safety management system on those indicators where the input of documentary evidence had been deemed to be important.

## 8. Testing the Evaluation Tool – the Pilot Study, October 2006

In October 2006, the research team went to Labrador City to pilot-test the draft evaluation tool. As noted above, based on workshop decisions and subsequent discussions between the research team and the Working Group at IOC, the pilot study design involved seeking a mixture of three different types of evidence for the various performance indicators-- documentary analysis, an employee questionnaire survey, and focus groups. For a copy of the survey and the focus group questions, see **Appendix F1 and F2**. As we have seen, the exact mix of evidence types for each indicator depended on decisions made by consensus during Step 7 on whether a particular performance indicator involved on the existence (or not) of a company or workplace policy, or whether what was also involved was the extent to which that policy had been implemented and whether it had proved effective. Where what was being measured was simply the existence of a policy, documentary evidence was usually regarded as sufficient. In cases where implementation and/or effectiveness had also been deemed important, documentary evidence was to be supplemented by a question or questions in the employee survey and/or by topics to be raised in the focus groups. The preliminary scoring table (**Appendix F3**, Evaluation Tool Results) indicates what mix of evidence was sought for each of the core indicators.

For the documentary evidence, the Chairs of the two JOSH Committees worked with the ESH General Manager to produce a large binder of documentation organized by indicator. The first analytic task of the research team was to score, on a scale of 0 to 5, the documentary evidence on each indicator where documents were part of the mix. The team began its analysis of these documents during its stay in Labrador City at IOC during their on-site visit in October and pursued the work in St. John's on its return.

Where it was felt that clarification was required, the team contacted the Working Group to ask for clarification (what did certain documents mean? were there any other documents on the same point? had we been provided with all the available documents on this issue or just a representative sample?). The results of this documentary analysis are summarized in **Appendix F4**. On a number of indicators, the research team determined that it still needed more information before it could reach a score. This finding was indicated in the summary by the use of a yellow colour coding, according to the legend provided at the top of the first page. In some instances, this discussion was held by e-mail or phone but, in many cases, a final decision on the scoring of the documentary evidence was possible only after follow-up discussion at the closing workshop in December 2007.

The employee survey was developed in consultation with Dr. Trevor Brown of Memorial's Faculty of Business Administration, an expert in questionnaire design. It contained 21 questions, divided into 7 sections. Each section consisted of a set of questions aimed at measuring performance indicators for a particular success factor, with a final section asking the respondent for information about himself/herself, such as employment category (unionized or staff), worksite (primary ore, product management, engineering and central services or administration) and length of employment at IOC (see **Appendix F1**). The survey was provided by the research team to IOC management and they mailed the survey out to all employees. A verbal reminder was given to the employees by officials of Local 5795 and again by the research team during its visit on-site later in the month of October. Unfortunately, the response rate was relatively low at 194, raising the issue of non-response bias (that is, that the people who responded might not be truly representative of the workforce as a whole but might differ from them in some systematic ways). This experience points to the need for devising an approach that would elicit a better response rate in any future implementation of the evaluation tool.

Dr. Brown met with a SafetyNet research assistant and advised her on data entry. He then analyzed the data and examined the quality of the survey in terms of its effectiveness in measuring the relevant performance indicators, with a focus on validity, reliability and practicality. Despite the low response rate, Dr. Brown was able to conclude that, based on the multiple methodologies used to design the survey, the questions included in the questionnaire demonstrated both "face" and "content" validity (see **Appendix F5**, page 2). In terms of practicality, he was able to identify areas of strength, areas for development, and also issues on which staff and union members perceived things in a substantially different way (see pages 4-7). On the basis of this positive assessment of our questionnaire, the research team proceeded to use the responses to assign average scores (out of a maximum of 5) for each indicator where a survey question had been involved. In addition, the researchers highlighted for discussion at the closing workshop any indicators on which Dr. Brown had found a significant discrepancy between the answers given by the employees and the answers given by the respondents who indicated that they were members of non-unionized staff. All questionnaire scores for the relevant performance indicators can be found in the table of results (**Appendix F3**).

During its visit to IOC in October, the research team also conducted eleven focus groups, two each from the concentrator, the pellet plant and the mine, and one each from the central services division, the middle managers, the general managers, the safety

specialists, and the USW Local 5795 Executive. Participants for the focus groups were selected by the two JOSH Committees based on guidelines provided by the research team. The scheduling was organized by the General Manager of ESH. The focus group questions were designed to target the chosen performance indicators where implementation and effectiveness were to be assessed. All focus groups except one were taped; hand-written notes were taken at the one session that was not taped. The tapes were transcribed verbatim and all focus group data was then analyzed to identify the main themes emerging from the focus groups, organized by success factor. Summaries of the main themes identified for each indicator formed the basis of the team's assessment of the score out of 5 to be assigned for each indicator. Two members of the team independently assessed the focus group evidence for each performance indicator assessed and provided a score. These independent scores were compared, revealing very few differences; where differences did emerge, the scores of the two assessors were averaged. This use of independent raters adds to the reliability of the assessment technique, while at the same time recognizing that the focus group data was originally in a qualitative rather than a numerical form. A report of the focus group evidence organized by performance indicator is provided in **Appendix F6**.

## **9. Merging the Pilot Study Evidence**

Using the three types of evidence collected during the site visit, the research team calculated overall scores for each indicator. This was done by averaging the scores from all the types of evidence that were used for each indicator (one type for a few indicators, two for many indicators, and three for some.) A table (**Appendix F3**) was produced for use at the Closing Workshop summarizing the results for all 35 indicators. A colour coding was used based on these overall scores:

- green for indicators whose overall score was above the average score for all indicators in this pilot, indicating strong performance worthy of continued cultivation;
- white for indicators whose overall score was in the average range, indicating that they were not in need of any special attention by the workplace partners in this evaluation cycle;
- red for indicators whose overall scores were below average (indicating items on which IOC needed to seek improvement); and
- yellow for indicators needing further discussion (items where employees and non-unionized staff or management differed substantially in their assessments in the surveys and the/or the focus groups, or where there was insufficient documentation, or where the wording of the question needed clarification.

## **10. Closing Workshop – 12 and 13 December 2007**

The closing workshop in Labrador City was designed to receive and refine the results of the pilot study, decide on the design of the final evaluation tool, evaluate the collaborative process and consider the next steps at IOC, as well as the possible use of the evaluation tool and the collaborative process that produced it in other workplaces (see **Appendix G1** for the workshop agenda). Participants paralleled those of the first workshop, including the project's international consultant, Dr. David Walters. The slides from the introductory presentation by the research team that set the context for



the workshop, and outlined the draft results of the pilot study, can be found in **Appendix G2**.

After this presentation, the first step was to discuss, and seek consensus on, any outstanding issues arising from the pilot study, i.e., the indicators that had been flagged in yellow by the research team in the table of results (Appendix F3). On the basis of these discussions, scores were determined for all of these indicators and the colour coding was changed where necessary to reflect the discussion. These adjusted results can be found in **Appendix G4**.

Next, the participants evaluated both the collaborative process and the resulting evaluation tool. There was general consensus that the process we had created had been positive overall, if a little lengthy and over-complex. The piloted evaluation tool was seen as very useful by both union and management participants in terms of benchmarking, highlighting strengths as well as areas needing attention, and calling attention to areas where there was a significant difference in perceptions between union and management. Some recommendations were made for improvement in the next round at IOC, bearing in mind as well the potential for application elsewhere.

The next use of the evaluation tool at IOC was provisionally agreed to be three years from the date of the final report on the project. Decisions on which rotating indicators were to be added to the core indicators would be made jointly between union and management. Short-term action at the company on those areas identified as in need of attention (either those flagged red or those still flagged yellow to indicate a significant discrepancy in scoring between workers and manager) was to be undertaken through management-union discussions. There was general agreement that a modified version of the evaluation tool would likely be appropriate for use in other large, single employer sites. For more detail on the workshop discussions, decisions and recommendations, please see **Appendix G3**. For the final evaluation tool (core indicators only) and pilot study results following the workshop, sent out as an interim final report in January 2008, see **Appendix G4**.

## **11-Evaluation – Some Thoughts from the Research Team**

In addition to the partners' broadly positive, but sometimes critical, assessments expressed during the closing workshop, the research team has developed a few further thoughts on the process and on the resulting evaluation tool. Overall, we regard the collaborative process as, without question, a positive feature of this project, allowing for input by employees, union and management into a multi-stage research design and implementation. The process facilitated agreement on areas of strength and the identification of some indicators where further discussion and clarification were needed, together with areas where short-term action was seen as desirable. The main criticism that can be leveled at our process was that it was excessively lengthy and complex and made excessive demands on the time and patience of the non-academic participants and on the time and resources of the academic team. In addition, although it is well known that OHS practitioners make every effort to separate health and safety issues from industrial relations matters, in the case of this study, this differentiation was not evident. Two labour disputes and their impacts on labour relations at IOC added lengthy delays to the process and may very well have coloured some of the results. This was, of

course, beyond the control of the research team and we would like to give credit to the workplace partners for their commitment to the project and their impressive ability to rise above these events and the tensions that preceded, and followed, them in order to resume the collaborative process again and again and to bring the study to an ultimate and successful conclusion.

Turning to the complexity of the process, which contributed to the duration of the study by requiring numerous meetings of the partners and between members of the research team, it is our opinion that, in any future exercise, some steps could be simplified or eliminated or merged with other components. To begin with, the literature review that we did for the design and pilot testing of the program would not have to be repeated in full in any subsequent implementation. Either the partners could agree to use the findings of the original review or they could commission a simplified follow-up study to examine only high-quality studies that had been published since the time of the initial review and to integrate their contents into the original findings. Similarly, we would recommend skipping the component (in Step 3) that involved taking each chosen success factor and breaking it down into dimensions and components. We would suggest moving straight from identifying success factors that are of interest to a particular workplace to selecting performance indicators. Also, it should be possible to substantially reduce the need to collect and analyze documentary evidence for many of the indicators chosen for a future exercise. We would suggest that, for indicators where the key issue is not whether or not a policy or procedure is in place but on whether that policy is actually implemented and/or whether its implementation has produced any significant effects, the evaluation should use survey questions and/or focus group items only. In addition, for the other indicators where documents are seen to be the key, the analysis could be simplified by learning a lesson from the pilot process. Many of the uncertainties and confusions surrounding the documentary evidence were eliminated or clarified very quickly by discussions at the closing workshop. In future iterations, either at IOC or elsewhere, an additional small face-to-face meeting between the researchers and key workplace partners could help the researchers make sense of the documents efficiently and at an earlier stage in the process.

In addition, either IOC in the future or another firm modifying the process for its own use, may decide (as we originally proposed for the IOC pilot study) to choose only one or two success factors for its first round, evaluate them, and then move on to others in future rounds of evaluation. The balance of core and indicating indicators is also up to the parties concerned and could result in a much more compact evaluation instrument if only one or two success factors with a narrowly focused set of core indicators are selected.

Finally, we think we need to ask whether our initial working hypothesis was or was not confirmed by the pilot project: did we produce a process and an evaluation tool that allowed workplace partners to learn things about their company and its OHSMS that they do not tend to learn through the application of standard evaluation processes and tools. We are convinced that the answer is a solid yes. Despite the fact that our process was interrupted twice by divisive and acrimonious strikes, it allowed employees and management at IOC to work together productively and to reach agreement on a new, tailor-made evaluation tool that targeted issues that they deemed to be of special relevance to their workplace. The distinction built into the evaluation tool between documentary evidence and evidence from the survey and the focus groups gave our tool

the capacity to help the participants identify and, for the most part agree on, dimensions of the company's HSMS for which good policies existed but where awareness of the policies or their effective implementation seems to have been less well developed. Similarly, by flagging issues on which the opinions of the employees differed substantially from those of management, our tool called attention to the existence of important problems while providing a venue (the closing workshop) for non-conflictual discussion of these issues and planning for their resolution. In these ways, our evaluation tool may be said to have proved its worth.

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**APPENDIX A - SafetyNet – Project 2b**  
**IOC WORKPLACE DATA FOR THE WORKSHOP - FEBRUARY 9 AND 10**  
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### **Background**

A review of the research literature on the effectiveness of occupational health and safety management systems (OHSMS) indicates that effective systems tend to share a number of success factors (for example, Frick et al. 2000; Gallagher et al. 2001; Hopkins 2000). For analytical purposes, these can be grouped into six broad categories:

1. the need for senior management commitment
2. comprehensive worker participation
3. proactive hazard identification and control
4. integration of health and safety management with other management systems, including the effective incorporation of organizational factors alongside behavioural factors
5. targeting long term outcomes such as occupational health as well as short term outcomes; and
6. broad-based auditing.

It should be noted at the outset that, in practice, some of these categories overlap or are mutually reinforcing, and all are inter-connected. For example, the last factor, broad-based auditing, is deemed important because some of the apparent gaps involving the other five factors were shown not to be effectively captured by conventional auditing approaches. In some cases, organizations such as the Longford gas plant in Australia (Hopkins 2000) or the Westray mine in Cape Breton (Richard 1997) that experienced serious accidents with fatalities had recently undergone favourable conventional audits. The evaluation tool to be developed in this project is not envisioned as an alternative audit instrument. Rather, it is seen as a supplement to conventional audits, focusing attention on key success factors identified through a consensus-based consultative process.

### **Methodology**

The workplace data presented in this report was collected as input for a multi-stakeholder workshop that will lay the groundwork for developing a consensus-based evaluation tool for OHSMS to be developed and piloted at IOC. Informed by the literature and the workplace data, participants will attempt to reach consensus on three broad questions: first, which aspects of OHSMS to focus on; second, how to develop performance indicators for the chosen factors; and third, how to develop measures of these factors in a workplace like IOC. The theoretical basis of the collaborative methodology used in the project derives largely from Guba and Lincoln's concept of "responsive evaluation" (1981, page 38), and, from a practical perspective, O'Sullivan's refinement of their work in her concept of "collaborative evaluation" (2004, page 24). According to Guba and Lincoln, a broadly based, collaborative approach to evaluation in general should build

in concerns or issues raised by the interested parties after initial consultation with them. They define a concern as a point raised by any stakeholder or group, whereas an issue is a point raised by more than one stakeholder or group. Decisions about the areas of interest to focus on in the evaluation exercise are then to be made collaboratively through facilitated discussions of the concerns and issues highlighted by the consultation. Using this approach, the researcher conducted interviews and focus groups at IOC in order to gain input on what employees and managers at IOC considered important in keeping a workplace safe and on what, if any, concerns they had. In order to capture the views of different levels and perspectives in the organization, she interviewed the ESH Manager and three other General Managers (responsible for the plant, the mine, and maintenance), the three ESH Technicians, and the four co-Chairs of JOSH. She also gathered information from other employees in various occupations and levels of the organization by means of eight focus groups - two each for the concentrator, pellet plant and mine, one each for central services and the summer students.

The taped transcripts were analyzed through a coding process informed by a “grounded theory” approach (Locke 2001). The codes were devised through an initial reading of the verbatim transcripts and consideration of the six success factors identified in the literature review. Each interview and focus group transcript was coded in order to identify main themes and how these themes related to the literature. Using a “constant comparative” method (Silverman, 2005, page 213), each of these summary sheets was compared with others in the interview or focus group set of data, and finally the data from the interviews and those from the focus groups were compared.

What follows is an analytic summary of the views and perspectives contained in the interviews and focus groups. It is important to note that no claims are being made by the Memorial University Research Team concerning the factual accuracy of any of these views. This report concludes by offering some suggestions on how the data may be used in the workshop to decide on the questions of focus, performance indicators and measures.

### **The interviews**

Implicit in all interviews, and sometimes referred to explicitly, was the underlying consensus on the importance of workers being able to return to their families safe at the end of the day. All eleven employees and managers interviewed saw good safety programs, standards and procedures together with employee participation and management commitment as important. The specific aspects of the safety systems highlighted as important varied somewhat, as did the relative emphasis on safety systems, employee participation and management commitment, and their relationship with one another. For example, with regard to safety systems, one interviewee emphasised the importance of developing rigorous processes in safety management, such as incident investigation, and noted the critical nature of training on safe procedures and the importance of regular monitoring to ensure continuous improvement. Three other interviewees emphasised the importance of education and training of workers. Two mentioned in particular the education of workers in their legislative rights to know about safety conditions, to participate, and to refuse unsafe work, while one interviewee focused on training in hazard recognition, especially

hidden hazards such as exposure to dust and chemicals, wearing PPEs and working safely. Another employee pointed to the importance of recording incidents as they happen, so that valuable lessons are not lost.

One interviewee saw the system of risk management combined with employee engagement as of major and equal importance in successful safety management.

Another interviewee stressed dialogue, communication and interaction between all levels of management and employees as the key to effective safety, especially for ensuring effective hazard recognition by employees. Indeed, all those interviewed that involving workers in safety programs was very important. Even if they used slightly different terms (such as engagement, or worker commitment, or safe individual behaviour, or individual responsibility and accountability) all interviewees stressed the need for each employee to play an active role in safety.

Three interviewees provided examples of effective worker involvement. Two of them described an employee suggestion initiative with built-in feedback and recognition called the Continuous Improvement Program. Results arising from this program in the mine included a new type of windscreen that did not shatter when hit by broken rocks and a task force made up of operators and a team leader that developed a new and safer hot seat change process. One of the same two interviewees and the third person spoke positively about the workshop, jointly organized and delivered by union and management, in which employees were asked for input on safety issues. An interviewee noted with enthusiasm that workers with 25 or 30 years' experience had told him that they had appreciated their first opportunity to participate in such an open consultative context.

For this interviewee, the workshops also illustrated the advantages of union-management cooperation. Similarly, one other interviewee emphasized union-management cooperation as crucial for effective workplace safety, and he, too, saw the workshops as a good example of this. A further illustration he provided of working together was the success of the joint occupational and health committees in recent years, such that it would be difficult for someone from the outside to tell who represented the union and who represented management. He also pointed to the mutual respect demonstrated by both sides in the committees.

While all interviewees noted the importance of management commitment at some stage during their interviews, three people stressed the importance of strong safety leadership to complement good safety systems, especially in terms of creating a sound safety culture with managers acting as role models while building in worker involvement wherever possible. One person referred to the objective of achieving visible and felt safety leadership and provided some good examples of where he felt this was in effect, such as the Safety Management Audit and the annual Safety Improvement Action Plan. For another interviewee, designing safety systems and building in effective accountability for adherence to company standards were part of this vital leadership role. Five other interviewees spoke positively about safety programs and procedures in general, with one person referring to best practices in this respect, even if they then identified some areas for improvement. Another two people saw continuous improvement in safety standards and procedures. One employee commented that from an historical perspective, management commitment was good overall and that sometimes this was underestimated. He specifically mentioned Take 5

and the Rio Tinto Standards as indicators of this commitment. While all interviewees noted the need for both management and worker commitment to safety programs and procedures, the interviews showed an interesting variation in focus. For some people, the emphasis was, overall, on the crucial need for individual employee engagement that would lead to safer work behaviour, with safety leadership and management commitment being seen as a vital part of this process. Others, although they deemed individual worker behaviour to be important, put the emphasis on the need for management commitment to produce safe working conditions enabling individuals to work safely.

Interestingly, this difference in perspective on where core responsibility lies, did not prevent a common theme emerging from the interviews. All interviewees agreed on the need for some improvement in hazard identification and control, albeit with slight variations in perceptions about the degree and nature of the problem. Some people emphasized hazard identification whereas others focused on hazard control. For example, some interviewees felt improvement was needed in ensuring accurate risk perception by workers on the job, while others stressed the need to tackle a large backlog of hazards already identified but not remedied, and pointed to organizational factors influencing individual behaviour at work.

To expand on this first perspective on hazard management, variable risk recognition and the apparent ignoring of risk by employees at times constituted a strong theme in four of the interviews and was implicit in another interview where the major focus was on the need for effective safety leadership in developing a sound safety culture. One person commented that in his experience, the majority of recent accidents had involved workers who had remarked afterwards that they had not recognized the risk at the time.

Turning to the second perspective, five other interviewees held the view that, in general, remedial action should be more timely once hazards had been identified. Four of them thought that the list of outstanding JOSH items was too long, noting that the delay appeared to be the lengthiest when high costs were involved, such as for ventilation units for the plan. One person observed that company studies of reported hazards went on for too long without any action at the end, and that sometimes change in management personnel could be a contributory factor in this pattern.

Outstanding hazards mentioned specifically included extreme heat in the plant, anchorage points for fall arrests on the gantry, crane over-lifting, housekeeping in the plant, hidden heavy duty electric cable, rock movements and variations in mine road conditions. The other specific hazard that concerned those interviewees who focused on working conditions was the degree of exposure to dust throughout the site, but especially in the crusher, feed tunnels, pellet plant and load-out area, as well as the roads, crusher and drilling in the mine. More than one person mentioned that the dust ventilation units had not been upgraded in twenty years even though production had expanded considerably. Moreover, the dust appeared to cause additional anxiety for them because it was not seen as just a workplace issue but also as a hazard for the town and their families and friends living nearby.

Significantly, another interviewee who was positive in general about the joint approach towards safety at IOC, also highlighted dust exposure as a major concern.



Even while acknowledging current work being carried out jointly by the union, the company and the government, in his view progress was too slow, TLVs were out of date, and he was worried about the long-term occupational health consequences. Also, two of the other group of interviewees who in general emphasized individual risk perception rather than working conditions expressed their concern with the dust exposure and the implications for long-term health.

Of the five interviewees who focused mainly on the importance of working conditions rather than worker behaviour, four also referred to the importance of individual worker behaviour or the need for individual commitment to working safely. What distinguished this group's approach was their identification of organizational factors they saw as negatively affecting worker adherence to safety rules and procedures. One of these five interviewees suggested that the company's adherence to the worker behaviour model of safety led it to underestimate the need to engineer out recognized hazards. Another interviewee in this group advocated a safety culture that nurtured worker commitment but went on to suggest that safe work behaviour was increasingly being undermined by a management focus on increasing production with fewer workers. He saw hazard identification and the effectiveness of the feedback mechanisms of the Take 5 Program as affected by this pressure for increased efficiency. For example, he thought that this pressure left too little time for clean up, and had led to a move away from a preventive maintenance program to one driven largely by equipment failure.

Another person in the group that emphasized organizational factors echoed this point about productivity pressures and suggested that the company may not always recognize the safety implications of asking people to work harder and faster. A stronger theme in his interview, however, featured another organizational factor: the crucial need for training on the occupational health side regarding the correct use of PPEs for respiratory protection and more education on the hazards of dust in general, especially for younger workers. This theme of education and training affecting hazard identification was also strong in another interview, and included the need for adequate training and mentoring of students and flexible workers. One other person in this group of interviewees referred to the company's recent contracting out of the orientation program, which led, he thought, to generic training and therefore excluded some important site-specific hazards. He also noted that this shift excluded the union from the orientation process and he felt that some of the basic health and safety rights, such as the right to refuse dangerous work, were now less well known and understood by new employees. This interviewee also suggested that the level of trust in management had declined in general since the strike in June 2005 and this, in his opinion, had adversely affected effective worker involvement, although he had seen a gradual rebuilding of trust in the most recent past.

It should also be noted that four out of the five interviewees who emphasized the importance of individual worker behaviour mentioned at least one organizational factor as potentially affecting this behaviour, showing at least some overlap with the other group. Factors seen as important were: the need for effective training being complemented by adequate mentoring of new and flexible employees regarding their ability to recognize the specific job hazards (one person); the adverse effect of negative feedback or discipline on open reporting, especially involving near misses

(two people); or the need to ensure that safety is perceived throughout the workplace as of equal importance to production (two people).

### **The focus groups**

Overall, in the eight focus groups, there was an underlying consensus that safety programs and procedures had improved over time. In response to the initial open-ended question ('What is important in making a workplace safe?'), employees in six out of the eight focus groups identified factors of importance. Four of these six groups noted the importance of constant alertness and vigilance for their own and others' safety. Taking the six groups together, some other factors that were noted as important were housekeeping, safety procedures, team effort, timely remedial action after hazards are identified, effective training for everyone, learning from the past, education and awareness of dust exposure and its health consequences, involvement by both workers and management, time to work safely, senior management commitment from the top down, input from workers on the floor, identification of root causes and the weekly safety talks. In all focus groups, some of those factors identified as important at the start were identified subsequently as needing some level of improvement. For example, in one group, at the very beginning an employee commented on how important the regular weekly safety talks were, and this triggered a discussion of how follow-up of hazards reported by workers in these talks and through other avenues seemed to be too slow. Two groups did not identify any factors of importance but moved directly to areas where, in their view, safety could be improved.

Although the main themes emerging from the eight focus groups varied slightly, a number of points arose fairly consistently. One was hazard identification and control. In six out of eight groups, people expressed frustration with what they saw as long delays in remedial action once they had identified hazards, delays that were seen as producing some disillusionment about worker involvement and reducing motivation for active engagement in safety matters. The highest level of frustration was expressed about dust levels both on site and in the town, and for many in the groups this was a strong indicator of the level of management commitment on occupational health, given their view that this hazard had been identified for a long time. For all but one of the eight groups, action on dust was seen as especially urgent in an aging work force, many of whom had worked twenty to thirty years for the company. The one exception was the session with the students, who recognized it as a big issue on the project, but did not identify it as such themselves; this was perhaps not surprising, given their relative youth and temporary employment. Certain areas of the project were described as having the most dust exposure, such as the crushers, the shuttle, feed tunnels, all of which generate what employees identified as the most dangerous type of dust, silica, as well as the pellet plant in general, the load-out area, mine roads and drilling (the last two items were also pinpointed as high in silica). It should be noted that some employees also criticized the government for adhering to out of date TLVs.

Another aspect of hazard identification and control that emerged from the focus groups was description of what they saw as an increasing trend towards discipline or negative feedback at middle management level over safety matters. This development was perceived as a barrier to open communications and reporting and thus safety in

general. It was clear from the discussion, however, that this was not the case throughout the project and varied among work sites. Even so, negative management attitudes or behaviour were seen by many as a deterrent to an effective Take 5 process, to taking action on a worker's judgement that a job is unsafe, and to the tracking of near misses. This concern was raised by seven of the eight groups, including the students, who indicated they felt an additional constraint because of their feeling of job insecurity or a desire for an eventual permanent job.

In general, follow-up of identified hazards and attitudes towards employee input on the shop floor were placed within the context of an increasing push for greater productivity, rather than being attributed to specific management personnel. All eight focus groups identified a growing tendency at all levels of management to prioritise production. However, this concern was a stronger theme in some focus groups than in others, and there was no tendency to criticize specific managers. Some employees saw the emphasis on productivity as reflecting pressure from above and in turn as linked to the potential implications for team leaders' performance evaluation. At times, the view was expressed that hazards were more likely to be fixed if doing so also seemed likely to enhance production.

Aside from the emphasis on productivity, other organizational factors also emerged from the focus groups sessions as being important but underestimated. Although these factors were not so consistently identified across all groups as the productivity issue, they were viewed as very important by those groups that did consider them. One such factor was the effect of the reorganization of work combined with downsizing. For example, higher dust levels in the recent past were seen as partly the result of cutbacks in housekeeping or, possibly, in maintenance crews, according to both focus groups from the pellet plant. And, in one of the mine focus groups, it was felt that downsizing had made it more difficult to ensure access to emergency vehicles in the winter.

Another organizational factor that was a strong theme in one of the pellet plant focus groups, and also evident in the central services and one of the mine sessions, was the safety implications of multi-skilling. The view overall was that there was a need for longer and more comprehensive training periods for new flexible employees, including substantial mentoring by co-workers. For the pellet plant group, this expanded training and mentoring were seen as especially needed in the context of increased production with fewer workers, and the dismantling of some clean-up crews. In one of the mine focus groups, more and better training and site-specific orientation was seen as necessary because of the daily changing nature of the mine and its many varying hazards. The discussion in the central services group was around the need for more training for multi-trade workers, but there was not so much support for co-worker mentoring as in the other groups as participants felt that the theory behind the work practices was sometimes missing, leading to potentially unsafe work. Finally, a substantial number of employees in one concentrator session felt very strongly about the safety and health effects of continuing shift-work, especially when combined with heavy work, a push for production and a downsized and aging work force.

### **The workplace data, the success factors and the workshop**

Analysis of the interviews and focus groups indicates that five out of the six success factors emphasized in the literature were considered important by the participants, although with varying emphases and from varying perspectives. More broadly based auditing was mentioned by only one interviewee, but it was not a significant theme either in that interview or in the data overall, despite its importance in the literature. This is not necessarily surprising, given the greater immediacy and more tangible impact of the other factors on the employees and managers consulted.

The analysis also indicated that the participants often blended two or more factors together, seeing them as interrelated and interdependent. When discussing production pressures and changing work patterns and their safety impact, focus groups often blended themes of hazard identification and control, organizational factors, and management commitment. In addition, management commitment and employee involvement often ended up being discussed simultaneously while reference was made to concrete examples of delayed follow-up on hazard management. This complex interdependence of factors poses a challenge for our workshop since we hope to produce a compact evaluation instrument focusing on only a small number of success factors. It does, however, reflect the main thrust of the literature that, to be effective, an OSHSM has to feature all these success factors combined. Ironically, it may well be that this interdependence can point the way towards a method to enable us to tackle the three tasks outlined for the workshop, as follows:

1. To design the sort of compact evaluation tool we want, we can't use all six of our success factors but must choose a smaller number. We can use the patterns of interdependence revealed in the workplace data to guide us in this selection. That is, we may be able to avoid leaving important factors out by blending some of them together following the linkages that emerged in the interviews and focus groups. We can strive to make our blended factors as inclusive as possible of the full range of success factors while still ensuring that they make sense analytically.
2. The workshop's next task will be to design a set of performance indicators that can track the presence and effectiveness of the selected success factors. The Memorial University Research Team will provide a menu of performance indicators drawn from the literature and this can be used as a starting point for the discussions. Bearing in mind the multiple linkages revealed in the workplace data, our objective will be to produce a manageable set of meaningful indicators for each chosen factor, while not leaving out any important aspects. Here again, it may be possible to take advantage of the way the workforce participants have grouped and interwoven the various factors to help us choose indicators that will maximize the scope of what we will track. By this we mean that we can try to pick, from the menu of indicators for a given factor, those that simultaneously capture other success factors that our workplace participants see as important and related, or, alternatively, develop new and more inclusive ones. For example, in designing performance indicators for hazard identification and control, we might want to use an

indicator that also captures the extent of employee participation and/or management commitment.

3. The last task of the workshop will be to begin the process of finding ways of measuring the various indicators we have chosen. Once again, we can optimize our approach by choosing or developing measures that allow us to capture both the specific success factor and indicator directly under consideration and others that have emerged as interrelated with it in the workplace data or in the literature. For example, if we are seeking to measure an indicator of management commitment, we might want to consider trying, as well, to measure an aspect of it that is connected to, say, hazard control or long-term health matters, or the inclusion of organizational factors.

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## APPENDIX B

May 3, 2004

### **Memorandum of Understanding**

Between:

**Memorial University (MUN)**

and

**The Iron Ore Company of Canada (IOC)**

and

**The United Steelworkers of America (USWA) Local 5795**

Whereas: IOC, USWA Local 5795 and Memorial University have agreed to collaborate in a SafetyNet research project for a period from May 2004 to December 2007, the objectives of which are:

- a) to undertake a comparative review of the safety and health regulatory frameworks covering oil refining and mining in Newfoundland and Labrador, other Canadian provinces, the U.S. and the U.K. and to examine possible regulatory reforms; and
- b) to develop and pilot-test a consensus-based evaluation program for safety and health management systems in oil refining and mining in Newfoundland and Labrador;

Whereas: IOC has agreed to permit its open pit mine and concentrator and pellet plants in Labrador City to be included in the study described above for a period from May 2004 to December 2007;

Whereas: USWA Local 5795 has agreed to recommend and encourage its membership to participate in the study described above for the period from May 2004 to December 2007;

Whereas: the SafetyNet research team of Memorial University, comprised of Dr. Stephen Bornstein, Dr. Susan Hart, and their research assistant or assistants, is committed to improving our collective understanding of the causes and consequences of work-related safety and health problems in Atlantic Canada and to promoting prevention of such problems;

Whereas: participation in the research project will require IOC to:

\* provide access to their open pit mine and processing plants to enable the research team to conduct interviews with management and employees, the selection of whom is to be agreed

May 3, 2004

between IOC, the SafetyNet research team of Memorial University and USWA Local 5795, as part of the preliminary data collection and the subsequent piloting of the draft evaluation program developed by the parties; \* provide access to their open pit mine and processing plants to enable the research team to conduct a questionnaire survey, the distribution of which is to be agreed between IOC, USWA Local 5795 and the research team, as part of the pilot study;

\* provide documentary and oral information on their safety management system, including information on the structure and operation of their occupational health and safety committee(s), and any policies or programs aimed at the long-term health of employees;

\* provide access to the minutes of their occupational health and safety committee(s) covering a period to be agreed on by the parties;

\* provide access to their records of accidents, itemized as far as is possible by type of injury, and near-misses, for a period of time to be agreed by the parties;

\* provide authorized members of the research team with secure and confidential access, conditional upon the fully informed consent of the individuals concerned, to a version of the health and/or workers' compensation records of employees that has been, in consultation with the WHSCC, carefully anonymized to protect the identities of all employees;

\* provide a company representative or representatives to attend two workshops organized to design the evaluation program and to provide two representatives to sit on the Steering Committee, one of whom will be a member of the Working Group, a sub-committee of the Steering Committee;

\* provide knowledge and expertise from their Environment, Health and Safety Division on workplace health and safety issues, as appropriate during the study.

And whereas: participation in the research project will require USWA Local 5795 to:

\* provide a union representative or representatives to work with IOC and the research team to reach agreement on: the selection of interviewees for both the preliminary data collection and the pilot stage of the study; the distribution of the pilot questionnaire survey; and the access and confidentiality protocol for any health and workers' compensation records used in the study;

\* provide the opportunity for a representative or representatives of the union to attend the workshops described above and provide two representatives to sit on the Steering Committee, one of whom will be a member of the Working Group, a sub-committee of the Steering Committee; -

\* provide knowledge and expertise from their national headquarters on workplace health and safety issues, as appropriate during the study;

Therefore, the parties agree as follows:

1. IOC and USWA Local 5795 agree to participate in the project and provide the resources, access, information and assistance as set out in the Recitals above and in the remainder of this Memorandum of Understanding.



May 3, 2004

2. Each party to this Memorandum of Understanding, except USWA Local 5795, agrees to bear its own costs and fees (including transportation, meals, hotel) in relation to the research **and the administration of this Agreement. Provided the procedures specified in Clause 13 have been respected, neither party shall be entitled to claim against the other parties for fees and costs that are associated with an early termination of the Agreement.**
3. All documents and electronic data provided by the company, the union and employees will be treated by all parties as fully confidential and stored in a secure location, access to which will be limited to authorized project researchers who have signed a confidentiality agreement with SafetyNet. All tapes and transcripts of interviews will be treated as fully confidential and stored in a secure location, access to which will be limited to authorized project researchers. Any person hired to transcribe taped interviews will be required to sign a SafetyNet confidentiality agreement.
4. Retention of the research data described in Clause 3 of this Memorandum of Understanding will be for the duration of the research project plus ten years. The ten-year period after the conclusion of the research project is required to allow for possible independent analysis and validation of the results of the study. This is standard practice in academic research and is considered a necessary component of a research project's integrity.  
  
Any request by an external researcher to access the research data for these purposes will require:
  - A written request detailing the objectives, research design and research integrity standards of the applicant;
  - Approval by the research ethics committee at the requester's host institution and at Memorial University;
  - A signed nondisclosure agreement with Memorial University.  
The destruction of research data at the end of the retention period will be done with secure methods; however, files containing the results of analyses, for example graphs or tables, may be retained.
5. The research will involve a collaborative process, involving all parties, through their participation in the workshops and their representation on the Steering Committee and its sub-committee, the Working Group. IOC, USWA Local 5795 and Memorial University shall each designate two members of its choice to the Steering Committee, which shall meet at least on a quarterly basis, in person or by telephone conference. Special meetings shall be convened at the request of any of the parties. The Steering Committee shall select a chair from among its members; the chair will facilitate the meetings but will retain full rights of committee participation. The Steering Committee will operate on the basis of equal participation of all parties, and decisions will be made on the basis of consensus among the members. All decisions about substantive changes in the research design or in



May 3, 2004

its implementation will be discussed in advance by the Steering Committee and will require prior approval of all parties. Each regular meeting of the Steering Committee will receive a report from the research team on progress in the project and on any concerns or problems. The Steering Committee will receive and discuss all plans for access by the research team to workplaces and employees. All members will treat the Steering Committee's deliberations and documents as confidential.

6. A small Working Group shall be established as a sub-committee of the Steering Committee, comprised of one representative each from IOC, USWA Local 5795 and Memorial University, to be selected by each party, to work together on the project between Steering Committee meetings. This Working Group shall also operate on the basis of equal participation and consensus decision-making. Any of the representatives on the Working Group has the right to convene a special meeting of the Steering Committee, either in person or by telephone conference as deemed appropriate. The Working Group's deliberations and documents will be treated by all members as confidential. The representative of the University researchers will chair the Working Group.
7. Any participation of employees or management staff in the research project will be fully voluntary and based on the signature of an informed consent document that has been approved by the appropriate Memorial University research ethics committee. Any personal information such as contained in health or workers' compensation files will be used only with the informed consent of the individual concerned and will be handled on a fully confidential and anonymized basis.
8. Throughout the course of the study all intended public releases about the project and its findings, including any final report, will be submitted in advance to all the parties for approval. The Steering Committee will develop a communications plan covering both external and internal communications, one objective of which will be to ensure that the local union membership and the plant's staff members will be regularly informed about the progress of the project.
9. For all intended scholarly publications and presentations to academic conferences based on the research project, including work by student research assistants, advance notice of at least one month shall be provided to the Steering Committee, or once it has ceased to exist, to representatives of all three parties for discussion. As is the normal practice of university researchers, the contributions of all partners will be acknowledged in any publication or presentation. Best efforts will be made to resolve any disagreements over the contents of such publications or presentations; any unresolved disagreements will be clearly articulated in the texts of the publication or presentation.

May 3, 2004

10. Each party (the "Indemnifying Party") shall indemnify and hold harmless the other parties, and their directors and employees (collectively the "Indemnified Parties") from and against third party claims initiated by agents, contractors, or ~~employees~~ of the Indemnifying Party or other third parties for which the Indemnifying Party is legally liable; which claims arise out of this Memorandum of Understanding or the performance thereof, and are for damages and expenses, including reasonable legal fees, attributable to bodily injury, sickness, disease or death or injury to, or destruction of, tangible property of third parties; PROVIDED HOWEVER that in no circumstances whatsoever shall a Indemnifying Party be required to indemnify and hold harmless a Indemnified Party for any claims or loss of a third party arising as a result of the negligence or wilful misconduct of an Indemnified Party. All MUN employees and students will provide evidence of health and accident insurance coverage prior to entering the IOC property in Labrador City. Such evidence will be delivered to the IOC representative on the Steering Committee.
11. Given the exploratory nature of the research and development activities undertaken as part of this project, Memorial University makes no representations or undertakings related to the quality or nature of the research work other than that such work will be performed in good faith and with the best of efforts of those participating in accordance with the objectives and spirit of this Memorandum of Understanding.
12. Subject to the provisions of Clause 13, this Memorandum of Understanding may be terminated at any time, in writing, **BY ANY OF THE PARTIES.** It may also be extended by an agreement in writing of all parties.
13. If a dispute arises with this Memorandum of Understanding, the parties agree to convene a Steering Committee meeting within 30 days to try and resolve the dispute and complete the research project expeditiously. The objecting party will detail its concerns in writing to the other parties in advance of the Steering Committee meeting. In the event the dispute cannot be resolved, despite the parties' best efforts, the research project will be terminated.
14. Any party withdrawing from the research pursuant to Article 12 or 13 will not be required to compensate the other parties. In the case of any such withdrawal, the requirements for confidentiality and protection of documents and tapes, and those concerning intellectual property, will remain in force and obligatory on all the parties.
15. Disclosure, ownership and licensing of any intellectual property developed as a result of this research project will be handled according to the Intellectual Property Guidelines attached to this Memorandum of Understanding as Appendix 1.

May 3, 2004

16. In the event of a work stoppage at the IOC facility, the Steering Committee will meet to discuss the impact on the project. The committee will determine by consensus whether to continue the project, suspend it for a specified time or terminate this agreement. Under no circumstances, will IOC or the USWA be liable or responsible for costs, fees or damages that may result from a work stoppage at its facility or the suspension or termination of this Agreement that may result from such work stoppage.
17. Within 30 days of the execution date of this agreement, the IOC and the USWA shall confirm the names of their representatives on the Steering Committee in writing to MUN's principal investigator Dr. Susan Hart. Dr. Hart will arrange the initial meeting who first task will be to decide the nature of the announcement of the agreement to all the employees of IOC and the media. The committee's second task will be to establish the commencement date for the research work at the IOC site.
18. The provisions of this Agreement are separable, and if, upon judicial interpretation or construction, any provision is determined to be unenforceable or prohibited by law, such provision shall be ineffective to the extent of such unenforceability or prohibition, without invalidating the remaining provisions of this Agreement.
19. The Laws of the Province of Newfoundland and Labrador shall apply to this Agreement and in respect of all matters ancillary thereto, and the Courts of Newfoundland and Labrador shall have exclusive jurisdiction.

May 3, 2004

IN WITNESS thereof, the parties have executed this Agreement the day and year first above written.

**SIGNING INSTRUCTION:** Please initial each page of this document IN THE LOWER RIGHT HAND CORNER and then sign below.

SIGNED FOR AND ON BEHALF OF  
Iron Ore Company of Canada

SIGNED FOR AND ON BEHALF OF  
Memorial University of Newfoundland

BY Greg SE 19/05/04  
TITLE GM-ESH

BY Susan M. Hart  
TITLE Principal Investigator

IN THE PRESENCE OF \_\_\_\_\_  
Darlene Bellini

IN THE PRESENCE OF \_\_\_\_\_  
Chandra 04/05/11

SIGNED FOR AND ON BEHALF OF  
United Steelworkers of America, Local 5795

SIGNED FOR AND ON BEHALF OF  
Memorial University of Newfoundland

BY George Koon 19/05/04  
TITLE President

BY Chandra  
TITLE Co Principal Investigator

IN THE PRESENCE OF \_\_\_\_\_  
Darlene Bellini

IN THE PRESENCE OF \_\_\_\_\_  
Chandra 04/05/10

SIGNED FOR AND ON BEHALF OF  
Memorial University Of Newfoundland

BY Barbara Cox  
TITLE Director Office of Research

IN THE PRESENCE OF \_\_\_\_\_  
Chandra

CH  
CMH

## **Appendix 1: Intellectual Property Guidelines**

### **Definitions**

“**Participants**” include IOC, USWA Local 5795, and Memorial University.

“**Background Intellectual Property**” means the intellectual property rights in the technology developed prior to the beginning of the Project and required for the carrying out of the Project or the exploitation of the Foreground Intellectual Property.

“**Foreground Intellectual Property**” means all technical data, including without limitation, all designs, specifications, software, data, drawings, plans, reports, patterns, models, prototypes, demonstration units, practices, inventions, methods, applicable special purpose equipment and related technology, processes or other information conceived, produced, developed or reduced to practice in carrying out the Project, and all rights therein, including without limitation, patents, copyrights, industrial designs, trade-marks, and any registrations or applications for the same and all other rights of intellectual property therein, including any rights which arise from the above items being treated by the Participants as trade secrets or confidential information.

### **Guidelines for Protection and Commercialization of Intellectual Property**

- 1) Copyright of the documents and/or digital media developed on the basis of the research project by employees of the parties or students of those employees shall remain the property of the employee or student.
- 2) It is not the intent of the parties to pursue commercialization of any Foreground Intellectual Property developed as a result of this project. Should that intent change, and where ownership is clearly that of one party, then protection and commercialization will be handled according to the policy of that party.
- 3) If the intent changes and Foreground Intellectual Property is developed jointly, with contributions from two or more Participants, it will be assigned to one of the Participants for protection and commercialization by mutual agreement. The percentages of the contribution from the parties will be either: equal and joint, or a percentage that is negotiated at the time of assignment. The parties contributing to the Foreground Intellectual Property will share the expenses of the protection and the revenues from commercialization, in the same proportion as agreed to at the time of assignment.
- 4) Should any party not wish to be involved in a patent application that one or more parties would like to pursue, then said party agrees not to frustrate the process and will assign their contribution to the invention to the other parties and waive any right to benefits that may be derived from the patent process and subsequent licensing.



**APPENDIX C - SAFETYNET WORKSHOP LABRADOR CITY  
FEBRUARY 9-10, 2006**

**SUMMARY OF LITERATURE REVIEW ON EFFECTIVENESS OF OCCUPATIONAL  
HEALTH AND SAFETY MANAGEMENT SYSTEMS (OHSMS)**

**Defining OHSMS**

- "... systematic occupational health and safety management." (Frick and Wren, 2000:17).
- "...a formalized management system to improve OHS, comprising a complex set of inter-related elements." (Gallagher et al. 2001:8).

**Origins of OHSMS**

- OHS reforms in 70s and early 80s in many industrialized countries did not bring expected improvements.
- Disaster investigations in 80s pointed to poor management systems, egs., the Ocean Ranger in Canada, Piper Alpha and Alexander Kielland in the North Sea, Bhopal in India.
- Quality management theory and practice were extended to OHS.
- OHSMS implemented in response to mandatory or state regulated requirements.
- Adopted by many medium and large companies in the high risk international industrial sectors such as the nuclear and oil and gas industries.

**Illustration of Model with OHSMS Elements (Gallagher et al. 2001):**

- Organization, Responsibility and Accountability (senior management involvement, line manager/ supervisor duties, management accountability and performance measurement, OHS policy).
- Consultative Arrangements (employer and employee OHS representatives, issue resolution, joint OHS committees, broad employee participation).
- Specific Program Elements (OHS rules and procedures, training programs, workplace inspections, purchasing and design, and emergency procedures).

**Types of OHSMS:**

- 'Safe Person' versus 'Safe Place' (Gallagher 2000; Frick et al. 2000)

***Safe Place Approach:***

- Emphasis on management of hazards.
- 'Adaptive hazard managers' (Gallagher 2000), that is, combining an "innovative/safe place" best practice.
- 'Organizational mindfulness' (Hopkins 2000), that is, proactive in continually searching out possible hazards, scanning the

environment for learning opportunities and always being alert for unexpected events happening.

- Senior management commitment to participatory approach in terms of safety representatives' role in system planning, implementation and review, and role of employees involved in OHS initiative.
- Often the model in mandatory OHS frameworks.

#### *Safe Person Approach:*

- Emphasis on risky individual behavior (Neilsen 2000).
- Focus on prevention of unsafe acts through training, peer pressure and co-worker surveillance.
- Downplays role of safety representatives and joint OSH committees in identifying and controlling underestimated or unknown hazards (Frick and Wren 2000; Nichols and Tucker 2000).
- Moves away from engineering out workplace hazards or redesigning work processes Frick and Wren 2000; Nichols and Tucker 2000).
- Underestimates the significance of OHS organizational context (Nichols and Tucker 2000; Shaw and Blewett 2000; Walters and Frick 2000; Woolfson et al. 1996).
- Often the model in commercial systems.

#### **Effectiveness of OHSMS**

- Factors that lead to effective OHSMS:
  - Senior management commitment.
  - Worker participation.
  - Proactive and vigilant hazard identification and control.
  - Integration with other management systems, building in organizational factors.
  - Targeting long as well as short-term outcomes.
  - Broad-based auditing.

#### **Senior Management Commitment**

- Identified as one of the most important success factors, if not a pre-condition (Gallagher et al. 2001).
- Emphasizes the role of 'leadership by example' (Workkutch and VanSandt 2000).
- Consistent with Gallagher's idea of 'adaptive hazard manager' and Hopkin's idea of 'organizational mindfulness'.

- Some indicators include (Gallagher et al. 2001):
  - Sufficient budget provided for a proactive OHSMS.
  - Empowered independent health and safety personnel and safety representatives and joint OHS committees.
  - Ensured open communication.
  - Management accountability for OHS to the same degree as for appraisal of production and quality achievements.

#### Worker Participation

- Together with senior management commitment, identified as a precondition of successful OHSMS (Gallagher et al. 2001).
- Benefits OHSMS through building in of workers' knowledge and experience and their monitoring role (Frick and Wren 2000).
- Employee consultation spectrum is represented by the following levels (Gallagher et al. 2001):
  - Management-driven provision of education.
  - Participative: Worker involvement in safety inspections and quality circles.
  - Directly influential: Safety representatives or OHS committee members.
  - Highest level: Representatives and committee members participate in planning, implementation and review of OHS activities.

#### Proactive and Vigilant Hazard Identification and Control

- Danger of being downplayed in favor of maintaining OHSMS as an end in itself and a determination to change workers' behaviour. Focus on standardized OHSMS resulted in distraction from identifying, reporting and controlling major operational hazards at Longford gas plant, which led to explosion (Hopkins 2000).
- Needs a risk assessment process that takes account of potential influence of socio-economic, political or cultural factors on risk perception, eg., an "acceptable risk" to engineers at NASA was actually a major hazard that caused the Challenger disaster (Casamayou 1993).
- Should build in control of excessive risk taking and the ignoring of known safety hazards, eg., Westray mine, Nova Scotia (Richard 1997).
- Participative risk assessment recommended but can be a challenge:
  - Representatives have to shift roles from being monitors of the OHSMS to "...active contributors within it while ensuring the independence, legitimacy and autonomy of worker's perspective of risk." (Walters and Frick 2000:61).
  - Possible disagreements over the significance of risk, adequacy of evidence, methodologies for evaluating and measuring risk, severity of



health effects, appropriate standards to regulate industrial practice and communication of risk information (Walters and Frick 2000).

- Current directive by EU Council of Ministers (1989) requires a collaborative risk assessment process and implement of preventive measures.
- Evidence of “...considerable involvement of representatives in workplace risk assessment” in Scandinavian countries (Walters and Frick 2000:62).

#### Integration with Other Management Systems and Building in Organizational Factors

- A broad concept of integration of management systems is important, in terms of:
  - Sufficient priority given to OHS in relation to other priorities such as quality of product or service (HSE 1997).
  - Building in organizational factors identified as a gap in OHSMS due to the tendency to focus on individual worker behaviour (Casamayou 1993; Frick and Wren 2000; Hart 2000; Hopkins 2000; Neilsen 2000; Nichols and Tucker 2000; Ryggik 1998; Shaw and Blewett 2000; Walters and Frick 2000; Wokutch and van Sandt 2002; Woolfson et al. 1996).
  - Awareness of the link between a collaborative industrial relations climate and senior management commitment to independent, worker-centered representation (Nichols and Tucker 2000).
  - Building into hazard management the way in which the labor process impacts health and safety, including patterns of work and organizational change (Woolfson et al. 1996; Nichols and Tucker 2000).
- A broad concept of safety culture as a means of building in human factors to OHSMS is important, because of:
  - Tendency of current concept to explain workplace accidents by focusing on individual human error rather than organizational factors (Frick and Wren 2000; Neilsen 2000).
  - Sees culture as a matter of individual attitude rather than characteristics of the organizations to which workers belong.
  - Lack of attention to the need to build in organizational mindfulness (Hopkins 2000) or for adaptive hazard management (Gallagher et al. 2001).
  - Lack of attention paid to informal work practices, devised by employees as a rational response to an event unforeseen by the designer of the formal rules, as in the circumstances leading up to the Longford gas plant explosion (Hopkins 2000) and as indicated in the engineers’ risk assessment, leading up to the Challenger disaster (Vaughan, cited in Hopkins).

- Communication failure has been identified as a gap in a number of disaster investigations, regarding:
  - Lack of information exchange between shifts (Ocean Ranger, Piper Alpha, Longford).
  - Ineffective hazard/near miss reporting system (Ocean Ranger, Piper Alpha, Three Mile Island, Westray, Challenger).
  - Failure to heed earlier warnings of disaster, including functional or departmental rivalry (Ocean Ranger, Longford, Three Mile Island, Westray, Challenger).

#### Targeting Occupational Illness As Well As Short Term Indicators

- Attention to risks of occupational illness seen as a crucial success factor (Gallagher et al. 2001).
- Current OHSMS tends to be biased towards short-term outcome measures (worker compensation and accident records) rather than longer-term health outcomes (occupational disease, repetitive strain injuries and workplace stress) (Gallagher et al. 2001; Wokutch and VanSandt 2000; Hopkins 2000; Frick and Wren 2000; Nichols and Tucker 2000; Shaw and Blewett 2000):
  - The tendency is to focus on easily-quantifiable areas (accident rates) rather than a complex set of inter-connected causes of occupational disease and a long period of dormancy before the onset of illness.
  - Concerns about the accuracy of incident data include:
    - Concealed range of other influences.
    - Focus on individual worker and not the environment.
    - Measuring failure and not success.
    - Measuring only injury frequency and severity and not necessarily the potential seriousness of the incident.
    - Inclined towards under-reporting lost time injuries (Hopkins 2000; Nichols and Tucker 2000; Shaw and Blewett 2000; Woolfson et al. 1996; Wokutch and VanSandt 2000).
    - Limited in measuring the effectiveness of the control of high-consequence, low-probability risks (Shaw and Blewett 2000).
- Effective worker participation and a strong bargaining agent has been linked with a higher likelihood of addressing longer-term hazards (Stephenson and Malloy 2000; Nichols and Tucker 2000).

#### Broader-based and Proactive Auditing

- Apparently successful audits have in the past failed to capture serious problems with safety at work, such as at Westray and at the Longford Gas Plant.
- Problems with conventional auditing of OHSMS include (Hopkins 2000; Gallagher et al. 2001):

- A narrow focus on low accident rates and passing a tick-box format audit.
- Lack of emphasis on proactive, vigilant or “adaptive” hazard management.
- Auditors generally do not recognize that senior management commitment and worker participation are preconditions to successful OHSMS.
- Lack of specialized OHSMS auditing staff; a general quality management background is insufficient for the job.

## APPENDIX D1

### **BACKGROUND INFORMATION FOR THE IOC- SAFETYNET WORKSHOP** **Labrador City** **February 9-10, 2006**

#### ***What is SafetyNet?***

*SafetyNet*, the research group that developed this study, is based at Memorial University. It is organized as a 'community alliance for health research, which means that it involves researchers from many different academic disciplines and a number of universities as well as partners from a wide range of non-university groups including business, labour, government departments, regulatory agencies and community groups. *SafetyNet*'s research is on health and safety in occupations that are central to the economy of Atlantic Canada with an original emphasis on marine and coastal occupations but an increasingly broad focus that now includes mining, forestry and other types of work. *SafetyNet* was created in 2001 with an initial multi-year grant from the Canadian Institutes for Health Research and it has, since then, received a number of other grants and has begun working on some interesting collaborative projects with research teams in the Maritimes and in Quebec.

#### ***The IOC-SafetyNet Research Study***

This study is one of eight major projects undertaken by *SafetyNet* as part of its initial grant. It has been designed by *SafetyNet*, I.O.C.'s health and safety management, and the United Steelworkers of America Local 5795 to study the use of consultative processes involving researchers, employees and employers to develop an evaluation tool for assessing the design and effectiveness of workplace health and safety management systems (HSMS). It begins from the premises that even the best HSMS needs to be reviewed and evaluated on a regular basis and that this evaluation should be based not only on standard audit methods but also on the ongoing experience and ideas of a company's employees and employers. The objective is to develop and pilot-test at I.O.C. a consultative process through which the company's workers and managers can, through discussions with *SafetyNet* researchers and international experts, produce an innovative evaluation tool attuned to the specific features of I.O.C. and its HSMS.

#### ***The February Workshop***

The February 9-10 workshop is the pivotal stage of this research project. Its purpose is to use two days of intensive discussions to work out the basic ingredients of a consensus-based evaluation tool for I.O.C.'s HSMS. The workshop will begin with a set of short presentations setting up the discussions. The presenters-- researchers from *SafetyNet* and international expert, Dr. David Walters of Cardiff University—will set out the objectives of the workshop, the approach to be used, and analyses of what the Canadian and the international literature on HSMS tells us concerning the factors that are common to the most effective systems. At that point, the real work will begin—small-group and full-team facilitated discussions that will select a few of these 'success factors', analyze each of them into components to be monitored by our evaluation tool, and develop indicators for each component. By the end of the workshop, we hope to have reached agreement on a set of key indicators to be included in the draft evaluation tool that will be further refined by the research team, then piloted at I.O.C. for possible adaptation and use in other similar workplaces.

**APPENDIX D2**  
**PARTICIPANTS IN SAFETYNET WORKSHOP**  
**LABRADOR CITY**  
**FEBRUARY 9-10, 2006**

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1. Phil Turner, General Manager, ESH, IOC
2. Rick Blundon, Safety Superintendent, IOC
3. George Kean, President, Local 5795, USWA
4. Andrew King, National Health and Safety and Environment Coordinator and Department Leader, USWA – Canadian National Office
5. Roy Roberts, Co-Chair, JOSH, IOC
6. Tony Brinston, Co-Chair, JOSH, IOC
7. Frazer Jerrett, Co-Chair, JOSH, IOC
8. Gerard Brenton, Co-Chair, JOSH, IOC
9. Pat Hinchey, Health/Safety Representative, IOC
10. Sue Hart, MUN
11. Stephen Bornstein, MUN
12. Marlyn Aryan, MUN
13. David Walters, University of Cardiff

## APPENDIX D3

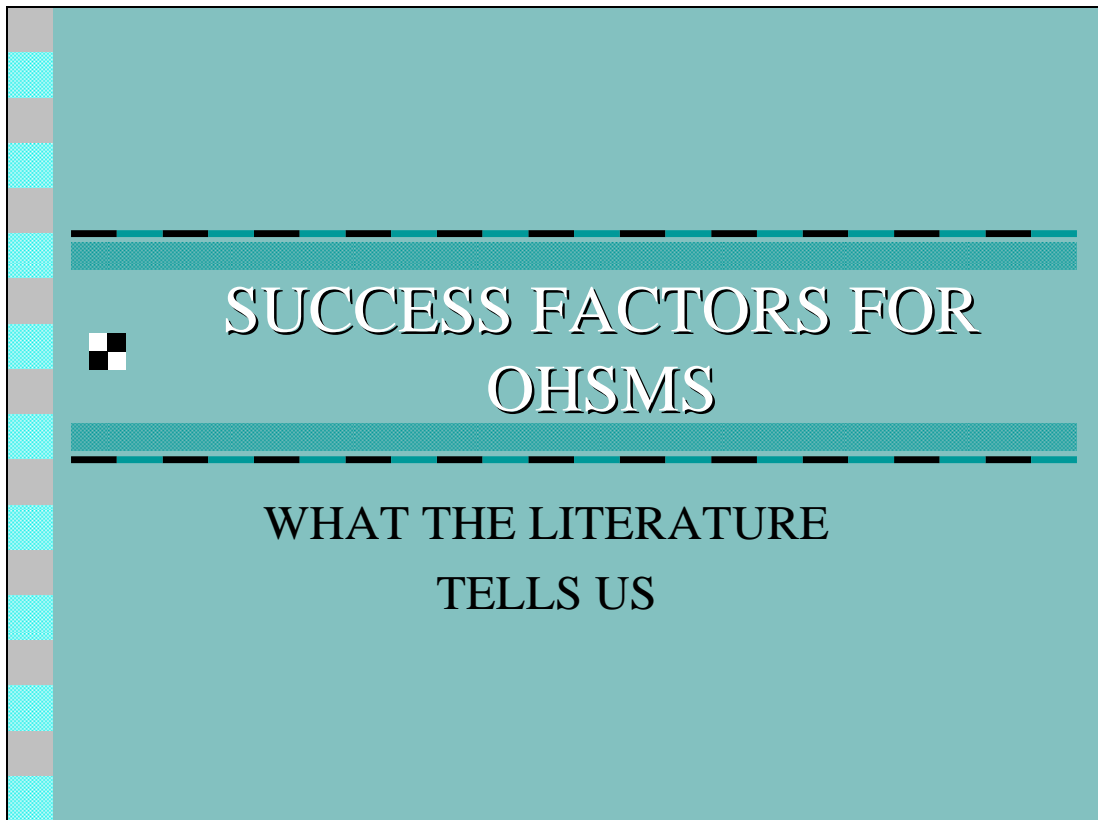
### **SAFETYNET/I.O.C. WORKSHOP EVALUATING HEALTH & SAFETY MANAGEMENT SYSTEMS LABRADOR CITY February 9-10, 2006 REVISED DRAFT WORKPLAN**

#### **Thursday, February 9**

8:30-8:40	Introduction: Background, Objectives and Methods (SB)
8:40-10:15	Opening Presentations and Discussion <ul style="list-style-type: none"><li>▪ S. Hart, <i>Success Factors for HSMS: What the Literature Tells Us</i></li><li>▪ D. Walters, <i>Success Factors: the European Experience</i></li><li>▪ S. Hart, <i>The IOC Workplace Study: What we Learned</i></li></ul> Discussion: Agreeing on a List of Success Factors
10:15-10:30	<i>Break</i>
10:30-11:00	Which Factors to Focus On (Breakouts)
11:00-11:30	Which Factors to Focus On (Seeking Consensus)
11:30-11:45	From Success Factors to Indicators (SB)
11:45-12:30	Success Factor #1: Dimensions and Indicators (Breakouts)
12:30-1:30	<i>Lunch Break</i>
1:30-2:30	Success Factor #1: Dimensions and Indicators (Seeking Consensus)
2:30-3:00	Measurement Methods and Criteria (S. Bornstein and S. Hart)
3:00-3:15	<i>Break</i>
3:15-4:00	Measurement Methods for the Chosen Indicators (Breakouts)
4:00-4:30	Measurement Methods for the Chosen Indicators (Seeking Consensus)
4:30-5:00	Taking Stock: Picking Another Success Factor

#### **Friday, February 10**

8:30-9:30	Success Factor #2: Dimensions and Indicators (Breakouts)
9:30-10:30	Success Factor #2: Dimensions and Indicators (Seeking Consensus)
10:30-10:45	<i>Break</i>
10:45-11:30	Measurement Methods for Factor #2 (Breakouts)
11:30-12:00	Measurement Methods for Factor #2 (Seeking Consensus)
12:00-1:00	<i>Lunch</i>
1:00-1:45	What have we got so far: what's captured and what's not? (Breakouts)
1:45-2:30	What have we got so far? (Seeking Consensus)
2:30-3:00	Next Steps To a Pilot Evaluation Tool



## ■ ROOTS OF OHSMS

- OHS reforms in 70s and early 80s in many industrialized countries did not bring expected improvements
- Disaster investigations in 80s pointed to poor management systems, egs., the Ocean Ranger in Canada, Piper Alpha and Alexander Kielland in the North Sea, Bhopal in India.
- Quality management theory and practice were extended to OHS





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## ■ TYPES OF OHSMS

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(AT RISK OF OVER-SIMPLIFICATION)

- Mandatory (eg., Norwegian Internal Control) or voluntary (eg., Du Pont, DNV)
- Safe place or safe person
- Participative or top-down



## ■ EFFECTIVENESS OF OHSMS

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- Senior management commitment
- Comprehensive worker participation
- Proactive hazard identification and control
- Integration of management systems and building in organizational factors
- Targeting long term as well as short term factors
- Broad-based auditing



# SENIOR MANAGEMENT COMMITMENT

- Pre-condition?
- Leadership by example
- Adaptive hazard managers/organizational mindfulness
- Open communication
- Management accountability for OHS



## WORKER PARTICIPATION

- Pre-condition?
- Builds in workers' knowledge, experience and monitoring role
- Highest level of participation best: safety representatives or OSH Committee take part in planning, implementation and review

# HAZARD IDENTIFICATION AND CONTROL

- Sometimes downplayed in focus on OHSMS as end in itself
- Risk assessment (RA) influenced by social, political, cultural and economic factors (internal and external), e.g., the Challenger
- Participative RA best but can be a challenge
  - Shift of roles
  - Reconciliation of different perspectives



# INTEGRATION OF MANAGEMENT SYSTEMS

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- OHS equal priority to product and service
- Build in organizational factors through integration
  - Safety culture about organizational characteristics as well as individuals
  - Collaborative IR climate linked with effective worker participation
  - Labour process affects OHS, eg., shift work



## ■ INTEGRATION (Continued)

- Organizational change affects OHS, egs., efficiency initiatives, multi-skilling
- Informal work practices can undermine formal rules and procedures, eg., Longford gas plant explosion

## ■ LONGER TERM OUTCOMES

- Attention to long-term factors seen as crucial to success of OHSMS
- But OHSMS currently tends to focus on short-term, easily measured outcomes rather than long-term more complicated outcomes, such as occupational disease, repetitive strain injuries, workplace stress.



# BROAD-BASED AUDITING

- Conventional auditing has failed to capture unsafe workplaces (such as Westray and Longford) because:
  - Need for more OHS expertise rather than just quality management credentials
  - Narrow focus
    - Accident rates
    - Tick box format
    - Misses need for “adaptive” hazard managers
    - Doesn't see management commitment and worker participation as preconditions for success





## BACKGROUND

- Consensus-based evaluation tool for OHSMS to be informed by both the literature – identified success factors – and the workplace data
- The workplace data was the first part of a multi-perspective consultation in the design process



## METHODOLOGY

- Based on ideas of “responsive evaluation” (Guba and Lincoln 1981) and “collaborative evaluation” (O’Sullivan 2004)
- Interviews: General Managers of ESH, the plant, the mine, and maintenance, the President of the Steelworkers Union Local 5795, JOSH Co-Chairs (4) and ESH Technicians (3)

## ■ METHODOLOGY (continued)

- Focus groups: Concentrator (2), pellet plant (2), mine (2), central services (1) and students (1)
- Transcripts coded and themes identified; “constant comparative” method used (Silverman 2005)
- Following summary is of views and perspectives of participants



# INTERVIEWS

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- Common themes on what's important:
  - Good safety programs, standards and procedures
  - Worker involvement or engagement
  - Management commitment or safety leadership



## INTERVIEWS (Continued)

- Interestingly, a somewhat different focus emerged on how these important factors relate to each other:
  - Individual employee engagement, with safety leadership being important in achieving this
  - Management commitment, indicated by safe working conditions enabling individual employee engagement



## INTERVIEWS (Continued)

- Nevertheless, both groups of interviewees agreed that hazard identification and control could be improved
- One group referred mostly to identification (eg. employees' variable risk perception) and the other control (eg. timeliness of remedial action)





## INTERVIEWS (Continued)

- Those who focused on working conditions overall also saw the importance of individual engagement but more often referred to organizational factors as affecting safe behaviour, such as increasing production targets
- Those who focused on risk perception did mention organizational factors, but were more likely to advocate training in hazard identification

# FOCUS GROUPS

- Half the groups noted importance of constant alertness and vigilance for their own and others' safety
- Six out of eight groups noted various important factors (a composite list)
  - housekeeping
  - safety procedures
  - team effort
  - timely remedial action
  - effective training for everyone
  - time to work safely
  - senior management commitment
  - input from workers on the floor, and
  - identification of root causes.



## FOCUS GROUPS (Continued)

- Fairly consistent themes across groups:
  - delay in remedial action once a hazard was identified
    - Most concern was expressed about levels of dust
    - But also about other safety-related matters



## FOCUS GROUPS (Continued)

- Ensuring a more receptive atmosphere for open communication with some middle management over safety matters
- The effect of increasing production with fewer workers
- A less common theme but seen as important by some groups, was the effect of multi-skilling and shift-work



## HOW THE DATA RELATES TO THE SUCCESS FACTORS

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- We can try to build these perspectives into the overall design of the evaluation tool
- Success factors were usually interwoven by participants, eg., hazard management with management commitment, employee involvement and organizational factors. This blending of factors can be used to inform us regarding our focus and on any subsequent performance indicators

# A C C U R A T E

- Accessible or measurable
- Controllable – Able to be changed by what you do in health and safety management
- Central and relevant to what you are trying to achieve
- Understandable and clear
- Reliable – providing the same scores when assessed by different people
- Acceptable to all users as appropriate and fair
- Timely to monitor
- Efficient to monitor (re: costs)

Source: National Occupational Health and Safety Commission (1999). *OHS performance measurement in the construction industry: Development of positive performance indicators.*

## APPENDIX D7

### **SAFETYNET/I.O.C. WORKSHOP EVALUATING HEALTH AND SAFETY MANAGEMENT SYSTEMS LABRADOR CITY FEBRUARY 9-10, 2006 SUMMARY OF RESULTS**

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#### **LIST OF SUCCESS FACTORS AGREED UPON:**

1. Employer and Employee Roles (Commitment/Responsibility, Participation)
2. Effective Hazard Management
3. Integration of OHS into General Management Systems (Change Management and Organizational Factors)
4. Quality of the OHSMS
5. Inclusion of both Long and Short Term Issues (i.e. not only safety issues but health issues as well)

#### **DISCUSSIONS ON EACH SUCCESS FACTOR**

*Note: We started working on Success Factor 1 and did a fairly complete job of roughing in its dimensions and components. For Success Factor 3, we managed to get some work done at the meeting but not in nearly as much detail. For the other 3 Success Factors, we simply did not have time to get very far. What follows is based on the notes taken by Marlyn on her laptop as we proceeded and edited by Stephen and Sue. It is not at all intended to be a complete record of everything that was said but rather a report on key points of consensus.*

#### **Success Factor 1 – Employer and Employee Roles (Commitment / Responsibility, Participation)**

##### **Dimension 1. Employer Commitment / Responsibility & Participation**

##### **Sub-dimension 1. Employer Commitment / Responsibility**

##### **Component 1. Resources Provided**

##### **Indicator 1.1. Right numbers of skilled people**

Component 2. Money Provided

Indicator 2.1. Equipment

Component 3. Does Management Behaviour match Mission values on OHS

Indicator 3.1. Senior/middle management behaviour

Component 4. Provision of appropriate training

Indicator 4.1. Training for everyone

Component 5. Follow-up of hazards that have been identified

Component 6. Providing a really safe place of work

Indicator 6.1. Productivity Pressures on OHS

Indicator 6.2. Shift work impacts

Indicator 6.3. Follow up of complaints, issues

Indicator 6.4. Appropriate manning levels for safety

Component 7. Compliance with legal responsibilities

Indicator 7.1. Having competent employees

Indicator 7.2. OHSMS auditing

Component 8. Delivering H&S corporate requirements

Indicator 8.1. Collective H&S agreements

Indicator 8.2. OHSMS auditing

Sub-dimension 2. Employer Participation

Component 1. Does the right level of managers participate in JOSH?

Indicator 1.1. Involvement of Supervisors

Component 2. Steering committee meetings

Indicator 2.1. Senior Management/VP?

Component 3. Upper management in safety tours

Indicator 3.1. Senior management presence

Component 4. Safety interaction with employees

Indicator 4.1. All management levels?

Component 5. Incident review

Indicator 5.1. Senior management presence

Component 6. H&S audit participation

Dimension 2. Employee Role

Sub-dimension 1. Employee Commitment/Responsibility

Component 1. Working safely



Indicator 1.1. Effective T5s, proper PPE, communicating hazards  
Sub-indicator 1. Identifying and Controlling  
Risks/hazards  
Indicator 1.2. Co-worker care  
Indicator 1.3. Competence

Component 2. Compliance with Procedures and standards (Duty to follow legislative duties)

Indicator 2.1. Compliance with procedures and standards  
Indicator 2.2. Awareness of safety issues

### Sub-dimension 2. Employee Participation

Component 1. Communication and engagement

Indicator 1.1. Active involvement in safety meetings/discussions  
Indicator 1.2. Reporting hazards (in addition to T5)  
Indicator 1.3. Ensuring information exchange  
Indicator 1.4. Notifying management if lack competence to do task/job  
Indicator 1.5. Accident investigation  
Indicator 1.6. Task-specific risk analysis  
Indicator 1.7. Developing/executing safe work procedures  
Indicator 1.8. Involvement in personal monitoring  
Indicator 1.9. Participation in safety talks  
Indicator 1.10. Knowledge of safety issues, procedures  
Indicator 1.11. Participation in developing safety standards

Component 2. Reporting and recording

Component 3. Attending meetings

### Dimension 3. Employee Representation

Component 1. Communication and feedback

Indicator 1.1. Access of Employee representatives to information

Component 2. Effective advocacy (JOSH)

Component 3. Competence (JOSH)

## **Success Factor 2 – Effective hazard management**

Dimension 1. Recognition

Dimension 2. Evaluation

Dimension 3. Control

Dimension 4. Risk communication

## Dimension 5. Training

### **Success Factor 3 – Integration of OHS into general management system (change management and organizational factors)**

#### Dimension 1. Organizational Policy and Procedures

- Component 1. Mission/mandate
- Component 2. Values
- Component 3. Representation
- Component 4. Ownership
- Component 5. Review
- Component 6. Planning
- Component 7. H&S systems and procedures

#### Dimension 2. Conceptualization and Design

- Component 1. Representation
- Component 2. Ownership/responsibility

#### Dimension 3. Implementation, Operation and Maintenance

- Component 1. Representation
- Component 2. Ownership/responsibility
- Component 3. Process safety

#### Dimension 4. Leadership

- Component 1. Supervision
- Component 2. Training
- Component 3. Decision-making
- Component 4. Evaluation
  - Indicator 4.1. Incentives
- Component 5. Hazard complaint resolution

Component 6. Safe place/safe person balance

Component 7. Open communication/no blame

#### Dimension 5. Management of Change

Component 1. Organization

Component 2. Process

Component 3. Equipment

### **Success Factor 4 – Quality of OHSMS**

#### Dimension 1. Learning

Component 1. Audit

Component 2. Review

Component 3. Proactive planning

#### Dimension 2. Coherence

Component 1. Internal consistency

Component 2. Incentive structure

Indicator 2.1. Promotion

Indicator 2.2. Rewards

Indicator 2.3. Recognition

Indicator 2.4. Budgeting

#### Dimension 3. Scope

Component 1. Coverage of people, issues, policies, contractors, suppliers, community, visitors, customers.

#### Dimension 4. Compliance

Component 1. Enforcement

#### Dimension 5. Functionality

Component 1. Clarity

Component 2. Accessibility

Component 3. Appropriateness

**Success Factor 5 – Inclusion of long-term issues (Health)**

Dimension 1. Surveillance

Component 1. Data collection

Component 2. Trend analysis

Dimension 2. Control of identified problems

Dimension 3. Identification of emerging problems

Dimension 4. OHS service quality

Dimension 5. Case management

Component 1. Return to work

**APPENDIX E1**  
**SAFETYNET/I.O.C. WORKSHOP**  
**EVALUATING HEALTH & SAFETY MANAGEMENT SYSTEMS**  
**ST. JOHN'S, AUGUST 15-16, 2006**  
**WORKPLAN**

1. Success Factor 1 (**roles** of employers and employees)

- agree on indicators to feature in this year's pilot study (no more than 30)
- discuss measures to be used, methods for gathering data on these measures and how performance will be assessed and reported on each indicator

2. Success Factor 3 (**integration** of OHS into overall management processes)

- examine list of dimensions, components, and possible indicators (to be sent to you later this week)
- agree on indicators to feature in this year's pilot study
- discuss measures to be used, methods for gathering data on these measures and how performance will be assessed and reported on each indicator

3. Success Factors 2 (effective **hazard management**), 4 (**quality** of OHSMS) and 5 (inclusion of **long-term health** issues)

- take one at a time
- start with current list of dimensions and components (we will distribute)
- discuss indicators for each component
- discuss measures

4. Decide on Structure of Pilot Project

- how many Success Factors and indicators
- how and when to design the questionnaire
- how to design the focus groups
- documentary analysis: which documents? who will do the work? when?

5. What to do in Subsequent Years: sequencing, rotation of questions, tracking (Phil's 'matrix' idea) avoiding gaps, ensuring longitudinal trend analysis

**LIST OF SUCCESS FACTORS AGREED UPON:**

6. Employer and Employee Roles (Commitment/Responsibility, Participation)
7. Effective Hazard Management
8. Integration of OHS into General Management Systems (Change Management and Organizational Factors)
9. Quality of the OHSMS
10. Inclusion of both Long and Short Term Issues (i.e. not only safety issues but health issues as well)

### **Success Factor 1 – Employer and Employee Roles (Commitment / Responsibility, Participation)**

#### Dimension A. Employer Commitment / Responsibility & Participation

##### Sub-dimension 1. Employer Commitment / Responsibility

- Component 1. Senior/Middle management behaves in a way that matches mission values
- Component 2. Money Provided
- Component 3. Does Management behaviour match mission values on OHS
- Component 4. Provision of appropriate training
- Component 5. Follow-up of hazards that have been identified
- Component 6. Providing a really safe place of work
- Component 7. Compliance with legal responsibilities
- Component 8. Delivering H&S corporate requirements

##### Sub-dimension 2. Employer Participation

- Component 1. Does the right level of managers participate in JOSH?
- Component 2. Steering committee meetings
- Component 3. Upper management in safety tours
- Component 4. Safety interaction with employees
- Component 5. Incident review
- Component 6. H&S audit participation

#### Dimension B. Employee Role

##### Sub-dimension 1. Employee Commitment/Responsibility

- Component 1. Working safely
- Component 2. Compliance with Procedures and standards (Duty to follow legislative duties)

##### Sub-dimension 2. Employee Participation

- Component 1. Communication and engagement
- Component 2. Reporting and recording
- Component 3. Attending meetings

#### Dimension C. Employee Representation

- Component 1. Communication and feedback
- Component 2. Effective advocacy (JOSH)
- Component 3. Competence (JOSH)

### **Success Factor 2 – Effective hazard management**

#### Dimension A. Recognition

#### Dimension D. Risk communication

#### Dimension B. Evaluation

#### Dimension E. Training

#### Dimension C. Control

### **Success Factor 3 – Integration of OHS into general management system (change management and organizational factors)**

#### Dimension A. Standard Business Operations and Processes

- Component 1. OHS Integration into business processes
- Component 2. H&S systems and procedures
- Component 3. Planning

#### Dimension B. Conceptualization and Design

- Component 1. H&S taken into account in design & engineering processes, equipment and related human aspects.

#### Dimension C. Implementation, Operation and Maintenance

- Component 1. Integrity of Equipment and Facilities
- Component 2. Ownership/responsibility
- Component 3. Process safety

#### Dimension D. Management of Change

- Component 1. Organization
- Component 2. Process
- Component 3. Equipment

### **Success Factor 4 – Quality of OHSMS**

#### Dimension A. Learning

- Component 1. Audit
- Component 2. Review
- Component 3. Proactive planning

#### Dimension B. Coherence

- Component 1. Internal consistency
- Component 2. Incentive structure

#### Dimension C. Scope

- Component 1. Coverage of people, issues, policies, contractors, suppliers, community, visitors, customers.

#### Dimension D. Compliance

- Component 1. Enforcement

#### Dimension E. Functionality

Component 1. Clarity  
Component 3. Appropriateness

Component 2. Accessibility

**Success Factor 5 – Inclusion of long-term issues (Health)**

Dimension A. Surveillance

Component 1. Data collection

Component 2. Trend analysis

Dimension B. Control of identified problems

Dimension C. Identification of emerging problems

Dimension D. OHS service quality

Dimension E. Case management

Component 1. Return to work



<b>SUCCESS FACTOR 1      EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)</b>		
<b>DIMENSION A      EMPLOYER COMMITMENT/ RESPONSIBILITY &amp; PARTICIPATION</b>		
<b>SUB-DIMENSION 1      EMPLOYER RESPONSIBILITY/COMMITMENT</b>		
<b>COMPONENT</b>	<b>INDICATOR</b>	<b>MEASUREMENT METHOD</b>
<b>1. Senior/ Middle management behaves in a way that matches mission values</b>	<b>a. (Senior/middle management behavior)</b>	
	a.1. Extent to which senior and middle management practice visible and felt safety leadership (HSEb).	Questionnaire / Focus Groups
	a.2. Extent to which the senior and middle management provide adequate supervision of work; work practices; and of the application and use of H&S measures (ILOb).	Questionnaire/ Focus Groups/ Documents
	a.3. Extent to which senior and middle management representatives are designated as responsible for overseeing the proper functioning of occupational health and safety management (ILOb).	Documents (organizational chart)
	a.4. Extent to which senior and middle managers provide regular health and safety briefings to operational personnel and to executives at Board level (HSEa).	Documents
	a.5. Extent to which senior and middle managers encourage operational personnel to identify and prioritize local health and safety issues (HSEa).	Questionnaire/Focus Groups
	a.6. Extent to which senior and middle managers support the use of intranets and databases for sharing knowledge of incidents or communicating good practice (HSE).	Documents/Questionnaire
	a.7. Extent to which senior and middle management work with contractors and suppliers to achieve H&S excellence (HSEb).	Documents
<b>2. Senior management's responsibility/commitment toward providing sufficient resources</b>	<b>a. (Provision of adequate service and support to skilled people)</b>	
	a.1. Extent to which managers and supervisors have the skills to coach their teams to work safely.	Documents
	a.2. Extent to which management provides employer and employee representatives with the mechanisms, time and resources necessary to participate effectively in key H&S processes (training, planning, implementation, evaluation, corrective and preventive action).	Documents; Focus Groups

	<b>b. (Money)</b>	<b>(Sufficient/adequate)</b>
	b.1. Extent to which management ensures that adequate resources for H&S operations are allocated in general budgets as well as promptly in response to identified emergencies.	Provision of adequate funding in budget documents
	b.2. Extent to which management empowers line managers to implement changes to respond to concerns by providing necessary budgetary resources (HSE).	Provision of adequate funding in budget documents
	b.3. Extent to which senior managers delegate budgets for special H&S initiatives (HSEa).	Provision of adequate funding in budget documents
	<b>c. (Equipment)</b>	
	c.1. Extent to which management invests in routine maintenance of the equipment, including PPE	Focus Groups, Questionnaire, Budgets
<b>3. Appropriate training for competence</b>	<b>a. (Training for everyone)</b>	
	a.1. Extent to which training, including induction training, is provided to all participants at no cost and takes place during working hours where possible (ILO:8).	Documents
	a.2. Extent to which training programs are designed for all categories of employees including: <ul style="list-style-type: none"> <li>- Orientation training of all staff</li> <li>- Job training for workers including initial position, major changes in job, and promotions</li> <li>- Job training for managers and supervisors</li> <li>- Specific and/or technical training, as appropriate</li> <li>- Training of contractors and contractual employees, including induction, and</li> <li>- Other categories, as appropriate.</li> </ul>	Documents: <ul style="list-style-type: none"> <li>• Number of training courses given and received by senior management (HSEb).</li> <li>• Number of managers who have attended OHS leadership training (CME).</li> <li>• Number of employees attending specific training courses per month/quarter/year</li> <li>• Number of induction programs for contractors.</li> </ul>
	a.3. Extent to which management consults with employees to identify OHS training needs (Worksafe).	Questionnaire; Focus Groups; Documents (number of courses revised or added following consultation)
	a.4. Extent to which management ensures that all personnel (including contractors and visitors) have undertaken training appropriate to the identified needs (Worksafe).	Focus Groups/ Documents

	a.5. Extent to which management ensures that the training is carried out by persons with appropriate knowledge, skills and experience in OHS and training (Worksafe).	Documents (tenders), Organisation Charts
	a.6. Extent to which mechanisms are in place to ensure that the scope, content and quality of the training programs are adequate, including feed-back from employees	Documents: <ul style="list-style-type: none"> <li>• Number of OHS training courses assessed for effectiveness and appropriateness.</li> <li>• Course Evaluation, Percentage of OHS training courses rated satisfactory or higher for effectiveness and appropriateness by the workforce (CME).</li> </ul>
	a.7. Extent to which training programs are reviewed following exercises of emergency plans and following incidents (OECD).	Questionnaire; Focus Groups;: Documents
<b>4. Employer's follow-up of identified hazards</b>	a.1. Extent to which managers take appropriate measures to eliminate or control identified hazards and risks (ILO).	Documents; Focus Groups
	b.1. Ability of all employees to take actions involving H&S, including T5s, without fear of negative consequences (OECD).	Focus Groups
	b.2. Extent to which management encourages workers to report hazards or procedure faults (worksafe).	Focus Groups
<b>5. Employer recognizes the impact of work organization and operations</b>	<b>a. (Productivity)</b>	<b>(Scheduling)</b>
	a.1. Extent to which management ensures that work organization does not adversely affect occupational safety and health (ILOb).	Focus Groups
	a.2. Extent to which H&S takes priority in cases where there is a conflict between H&S and operational goals (OECD).	Focus Groups; Documents: minutes, job descriptions, performance evaluations, schedules
	a.3. Extent to which the relative importance of H&S, compared to productivity, is communicated (HSEh).	Focus Groups; Documents: Operating procedures, communications materials
	<b>b. (Short and long-term impacts of shift work on H&amp;S)</b>	<b>(Overtime)</b>

	b.1. Extent to which management considers H&S implications of decisions about shift patterns, including the type of work and worker involved? (HSEh)	Focus Groups; Documents: HR procedures, operating procedures; scheduling records, calculation of TLV values for long shifts
	<b><u>b.2. Extent to which the exchanging of shifts between operators is recorded and periodically reviewed (HSEh).</u></b>	Documents
	<b><u>b.3. Extent to which the amount of overtime that individuals work is monitored and controlled (HSEh).</u></b>	Documents: HR rules; overtime (and second job) bans for those working long shifts (Quinlan).
	b.4. Extent to which OHS information is exchanged between work groups on shift change.	Documents: Number of departments where there is a formal handover between shifts/shift swings (CME).
	b.5. Extent to which formal standards are applied for maximum working hours, including overtime in peak work periods, and minimum rest days.	Documents; Focus Groups
	<b>c. (Appropriate staffing levels)</b>	
	c.1. Extent to which management evaluates staffing arrangements in terms of H&S.	Focus Groups ; Documents
	c.2. Extent to which workload is assessed for H & S purposes, taking into account all required tasks, peaks and troughs (HSE).	Focus Groups ; Documents
<b>6. Senior management and the audit</b>	<b>a. (OHSMS auditing)</b>	
	a.1. Extent to which senior management regularly reviews the company's H&S performance (HSE).	Documents
	a.2. Extent to which the Board receives regular H&S reports (HSEb).	Documents
	a.3. Extent to which informal audits of site activities are conducted by OHS specialists.	Documents
	a.4. Extent to which managers provide for external H&S audits.	Documents
	a.5. Extent to which senior managers review internal and external H & S audit findings and implement supporting action plans to address them (HSEa).	Documents: Number of reports and ratio of action to reports on internal audit findings.

	a.6. Extent to which levels of worker involvement and management commitment are recognized as crucial factors in audits.	Documents
	a.7. Extent to which employee feedback is built into the audit process.	Documents: audit instrument

<b>SUCCESS FACTOR 1. EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)</b>		
<b>DIMENSION A. EMPLOYER COMMITMENT/ RESPONSIBILITY &amp;PARTICIPATION</b>		
<b>SUB-DIMENSION 2. EMPLOYER PARTICIPATION</b>		
<b>COMPONENT</b>	<b>INDICATOR</b>	<b>MEASUREMENT METHOD</b>
<b>1. Participation of the right level of management in mandatory H&amp;S committees.</b>	<b>a. (Safety Superintendents)</b>	
	a.1. Extent to which appropriate levels of management sit on the joint HS committee	Documents
<b>2. Participation of right level of management in non-mandatory joint steering committee.</b>	<b>a. (Senior Management/VP)</b>	
	a.1. Extent to which non-mandatory joint steering committees on OHS are established	Documents
	a.2. Extent to which management are represented on non-mandatory joint steering committees	Focus Groups; Documents

3. Participation of upper management in safety tours	a.1. Extent to which senior management participate in safety tours and other visible H&S activities (OECD).	<b><u>Documents:</u></b> <ul style="list-style-type: none"> <li><b><u>Number of safety tours and hours spent by senior management (HSEb).</u></b></li> <li><b><u>Number of scheduled H&amp;S briefings requested by senior management. (HSE Review of safety culture)</u></b></li> </ul> : Focus Groups: Management visibility in daily operations (daily/weekly).
	a.2. Extent to which senior managers pay timely attention to the items identified through safety walks?	Documents: Percentage of issues identified on safety walks that are remedied (NOHSCb). Documents: The proportion of items identified through safety walks that are repeat items, measured over a specified time period.
4. Positive participation of management in safety interaction with employees	a. (All management)	Documents: performance reports and evaluations, number of management's regular personal contacts with H&S representatives  Documents: Number of management's formal contacts with contractors on H & S issues
	a.1. Extent to which senior managers discussing H&S as the first item at any meeting and use open questions to encourage responses (HSEa)	Documents: agendas, minutes; Focus Groups
	a.2. Extent to which management at all levels seek feedback from the ground up on OHS issues.	Focus Groups ; Documents: Number of open meetings held by management.
	a.3. Extent to which management provides health and safety representative(s) copies of the results of any reports concerning occupational health and safety in their possession? (HCHSA)	Focus Groups; Documents
	a.4. Extent to which senior managers share good practice or learning from incidents through Intranets, open meetings (HSEa).	Documents

5. Participation of Senior management in incident reviews	a. (Senior management presence)	
	a.1. Extent to which senior managers take part in follow-up of incidents (OECD).	Documents
	a.2. Extent to which senior managers chair serious incident investigations and report findings (HSEa).	Documents: Percentage of managers leading an incident investigation. .

**Legend:**

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<b>SUCCESS FACTOR 1. EMPLOYER AND EMPLOYEE ROLES (COMMITMENT / RESPONSIBILITY, PARTICIPATION)</b>			
<b>DIMENSION B. EMPLOYEE'S ROLE</b>			
<b>SUB-DIMENSION 1. EMPLOYEE RESPONSIBILITY/COMMITMENT</b>			
<b>COMPONENT</b>	<b>INDICATOR</b>		<b>MEASUREMENT METHOD</b>
<b>1. Duty to follow OHS regulations as well as company standards and procedures</b>	<b>52</b>	1.a. Extent to which employees have a high level are aware of OSH regulations; company standards and procedures.	Questionnaire; Two Focus Groups- Team leaders and workers
	<b>53</b>	1.b. Extent to which expectations about performance standards are shared (HSEa).	Focus Groups
	<b>54</b>	1.c. Extent to which employees accept their personal role and contribution in meeting these expectations (HSEa).	Focus Groups
	<b>55</b>	1.d. Extent to which employees comply with the regulations, standards and procedures.	Docs; Two Focus Groups: Team leaders and workers
	<b>56</b>	1.e. Extent to which procedures are systematically appraised to determine compliance with applicable standards and procedures (OECD).	Docs
<b>2. Working safely</b>	<b>57</b>	2.a. Extent to which Take 5s are effective.	Questionnaire; Focus Groups; Docs
	<b>58</b>	2.b. Extent to which procedures are in place to ensure the proper use of personal protective equipment (PPE) in accordance with the rules (OECD).	Docs
	<b>59</b>	2.c. Extent to which employees identify and control risks/hazards: <ul style="list-style-type: none"> <li>Extent to which employees have a clear understanding of hazards in the workplace: <ul style="list-style-type: none"> <li>*in general (e.g. conveyor belts, electricity)</li> <li>*in their own job and immediate surroundings</li> </ul> </li> <li>Extent to which employees have a clear understanding of controls of identified hazards: <ul style="list-style-type: none"> <li>* in general</li> <li>*in their job and immediate surroundings</li> </ul> </li> </ul>	Questionnaire Focus Groups, including effectiveness of T5s.  Focus Group
	<b>60</b>	2.d. The extent to which employees communicate hazards and related H&S concerns, ideas and suggestions to those with authority to take action.	
	<b>61</b>	2.d.1. Extent to which employees inform a supervisor of any H&S hazards or system deficiencies in the workplace (AIHA).	Docs; Focus Groups






	<b>62</b>	2.d.2. Extent to which employees make recommendations regarding possible hazard control and reporting procedures (ANSI).	Docs; Focus Groups
	<b>63</b>	2.d.3. Extent to which employees use near-miss reporting practices (HSEb).	Docs; Focus Groups
<b>3. Co-worker care</b>	<b>64</b>	3.a. Extent of perception of co-worker care	Questionnaire; Focus Groups including JOSH, on safety culture
<b>4. Competence</b>	<b>65</b>	4.a. Extent to which all employees have a clear understanding of their job tasks.	Questionnaire, Focus Groups (supervisors)
	<b>66</b>	4.b. Extent to which employees at all levels ensure they have the right competence for both normal circumstances and during unusual circumstances or increased workload (OECD).	Focus Groups: JOSH and employees
	<b>67</b>	4.c. Extent to which management is notified if there is lack of competence to do the task/job.	Docs

SUCCESS FACTOR 1.		EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)	
DIMENSION B.		EMPLOYEE’S ROLE	
SUB-DIMENSION 2.		EMPLOYEE PARTICIPATION	
COMPONENT	INDICATOR		MEASUREMENT METHOD
1.Communication and Engagement	68	<u>1.a. Extent to which employees’ are actively involved in regular meetings and discussions (daily, weekly, monthly) and working groups related to safety and health (including, for example, development of standards, risk analysis groups, development of control measures, audit and review teams, problem resolution).</u>	Docs; 2 Focus Groups: 1 employees; 1 supervisors/managers
	69	1.b. Extent to which employees get involved in hazard management, including incident investigation and monitoring task-specific risk assessments (HSL).	Docs: Number of employees participating in H&S investigation teams; number of key personnel who have completed incident investigation training (CME).
2. Audit and review	70	2.a. Extent to which employees get involved in audits and reviews.	Docs; 2 Focus Groups
	71	2.b. Extent to which employees get involved in systematic monitoring of audits and reviews.	Docs; 2 Focus Groups

<b>SUCCESS FACTOR 1</b>		<b>EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)</b>	
<b>DIMENSION</b>		<b>EMPLOYEE REPRESENTATION</b>	
<b>COMPONENT</b>	<b>INDICATOR</b>		<b>MEASUREMENT METHOD</b>
<b>1. Communication and feedback – JOSH</b>	<b>1.a. Access</b>		
	<b>72</b>	1.a.1. Extent to which H&S representatives provide toolbox talks on topical H&S issues.	Docs
	<b>73</b>	1.a.2. Extent to which the H&S representatives directly consult with, <b>and provide feedback to</b> , the employees.	Focus Groups
	<b>74</b>	1.a.3. Extent to which H&S representatives keep employees informed of safety matters (notice boards, holding meetings, newsletter and mailings) (HSEc).	Docs
	<b>75</b>	1.a.4. Extent to which feedback is provided to employees following their involvement in aspects of H&S (NOHSC).	Focus Groups
<b>2. Effective advocacy (JOSH)</b>	<b>76</b>	2.a. Extent to which employee representatives adopt continuous reviewing (NOHSC).	Focus Groups (JOSH)
	<b>77</b>	2.b. Extent to which H&S representatives inspect workplace for hazards (HSEc).	Docs
	<b>78</b>	2.c. Extent to which H&S representatives investigate complaints (HSEc).	Docs
<b>3. Competence (JOSH)</b>	<b>79</b>	3.a. Extent to which H&S representatives attend supplementary and external safety representative training courses (HSEb).	Docs
	<b>80</b>	3.b. Extent to which H&S representatives hold discussions of H&S policies, review the existing H&S policies and procedures and suggest improvements (HSEc).	Docs
	<b>81</b>	3.c. Extent to which H&S representatives investigate accidents and other H&S incidents (HSEc).	Docs
	<b>82</b>	3.d. Extent to which H&S representatives keep themselves informed about standards relating to H&S generally recommended or prevailing in workplaces of a comparable nature (NT).	Focus Groups
4. Training	<b>83</b>	4.a. Extent to which H&S representatives participate in job-specific induction training (which includes safety awareness) before a worker is permitted to commence work on the site or a new project (AIHA).	Docs
	<b>84</b>	4.b. Extent to which H&S representatives conduct training needs assessment associated with H&S responsibilities within last year (HSEc).	Docs

*\* Items in bold characters reflect the points raised at the workshop.*

**Legend:**

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	USWA
	MUN

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**SUCCESS FACTOR 3: INTEGRATION OF OHS INTO GENERAL MANAGEMENT SYSTEM  
(CHANGE MANAGEMENT AND ORGANIZATIONAL FACTORS)**

**DIMENSION A: STANDARD BUSINESS OPERATIONS AND PROCESSES**

<b>Component</b>	<b>Indicator</b>	<b>Measurement Method</b>
<b>1. OHS Integration into Business Process</b>	<b>1.</b> 1. Extent to which H&S is managed in a similar way to other aspects of the business, and is as much the responsibility of line management as any other function.	Extent to which senior managers demonstrate priority for H&S through highlighting H&S issues when making business decisions (HSEa).
	<b>2.</b> 2. There is evidence of health and safety policy being fully integrated into product, plant design, etc. (HSEa).	1. <b>Site safety policy</b> 2. Audit reports, action plans 3. Performance monitoring graphs 4. Safety committee minutes 5. Company wide literature with safety information included (safety improvement initiatives and safety performance figures)
<b>2. Health and Safety Systems and Procedures</b>	<b>3.</b> 1. Extent to which all phases of operations, including start-up, normal operations, shut-down, abnormal and emergency situations, emergency activities, maintenance, laboratory, transport, housekeeping, security, and other activities, needing procedures, are covered by such (normally written) procedures (OECD).	
	<b>4.</b> 2. There is evidence of a means to ensure that relevant information is passed on from one stage to another and incorporated in H&S procedures when developing or introducing new products, processes or equipment (OECD).	
	<b>5.</b> 3. There is evidence of a means to ensure that other procedures are found to conflict with H&S requirements or if not working properly (OECD).	
<b>3. Planning</b>	<b>6.</b> 1. There is evidence of H&S considerations being integrated into the planning and implementation of every new project (HSEa).	

### **SUCCESS FACTOR 3: INTEGRATION OF OHS INTO GENERAL MANAGEMENT SYSTEM (CHANGE MANAGEMENT AND ORGANIZATIONAL FACTORS)**

#### **DIMENSION B: CONCEPTUALIZATION AND DESIGN**

**1. Health and safety are taken into account in design and engineering of processes, equipment, and related human aspects.**

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|-----------|---|--|
| <b>7.</b> | 1. There is evidence of a procedure to incorporate and take advantage of the experience of employees in the design and engineering work to ensure H&S (OECD). |  |
| <b>8.</b> | 2. There is evidence of a general design rule applied that systems and components should in general be designed to be “fail-safe”(OECD).                      | 1. Number of projects where there has been nil incidents/non-compliances reported related to design (OECD).<br>2. Percentage of incidents where poor design was a root cause, calculated over a specified time frame (NOHSCA).   |
| <b>9.</b> | 3. Extent to which OHS is addressed in the design, planning and procurement phases and activities of all or any new projects (NOHSCb).                        | 1. Percentage of design changes required as a result of OHS problems, calculated over a specified time frame.<br>2. Percentage of incidents where poor design was a root cause, calculated over a specified time frame. (OECD)<br>3. Number of instances where design changes are made to address identified OHS issues over the life of the project.<br>4. Number of instances where changes are made to planning and scheduling to address identified OHS issues over the life of the project.<br>5. Percentage of incidents where poor design was a factor, calculated over a specified time frame. |

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|------------|--|--|
| <b>10.</b> | 5. There is evidence of a consistent approach to identification and assessment of risk prior to design, fabrication, installation & commissioning of plant and equipment (OECD). | 1. Number of risk assessments conducted during the design/fabrication phase (OECD).<br>2. Number of risk assessment reviewed during the commissioning phase (OECD).<br>3. Number of risk assessments that have been included in the design & fabrication process (CME).<br>4. Number of departments that systematically apply risk assessment prior to the design, fabrication, and installation of equipment (CME).<br>5. Number of injury occurring after equipment has been installed but has not had a risk assessment (OECD). |
|------------|--|--|

## DIMENSION C: IMPLEMENTATION, OPERATION AND MAINTENANCE

### 1. Integrity of Equipment and Facilities

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|------------|--|---|
| <b>11.</b> | 1. There is evidence of the existence or, and compliance with, safety procedures for critical maintenance work, such as lock-out of rotating equipment, tag-out of equipment, and by-passing safety-critical alarms and interlocks (OECD). |   |
| <b>12.</b> | 2. Extent of preventive maintenance versus corrective maintenance (OECD).  | 1. Number of newly purchased plant/ equipment being entered into preventative maintenance plan.<br>2. Number of departments that have a preventative maintenance program in place for equipment and/or machinery (CME).<br>3. Percentage of operators who carry out preventive maintenance and breakdown maintenance in their day to day operations (CRR).<br>There is evidence of the existence of, and compliance with, a procedure for checking that the equipment is maintained according to the specified engineering documentation, following all |

the mandatory requirements and additional internal requirements (OECD).

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|-------------------------------------|------------|--|
|                                     | <b>13.</b> | 3. Extent of maintenance back-log for safety critical items ( <i>i.e.</i> , actions not complete by “due dates”) (OECD).   |
|                                     | <b>14.</b> | 4. Extent of testing of safety devices carried out versus testing planned (OECD).  |
| <b>2. Ownership/ Responsibility</b> | <b>15.</b> | 1. Extent to which all aspects of control room operations are reviewed periodically and constructively with the involvement of operators with a view to ensure safety and health (HSEe). |
| <b>3. Process safety</b>            | <b>16.</b> | 1. The extent to which safety instructions are integrated in or coordinated with operating instructions (OECD).  |

#### **DIMENSION D: MANAGEMENT OF CHANGE**

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|------------------------|------------|--|---|
| <b>1. Organization</b> | <b>17.</b> | 1. There is evidence of policy or guidelines for managing changes to processes, procedures and people, which cover all the necessary steps from planning to implementation and follow-up (OECD).           | 1. Procedures for managing equipment, procedural and organizational change.<br>2. Organizational change policy document.<br>3. Evidence of review after implementing change.<br>4. The register of all staff in the organization with relevant roles. |
|                        | <b>18.</b> | 2. There is evidence of information made available to senior management on progress with all actions identified by risk assessments and reviewed as required before the change is completed (HSEc).        |   |
|                        | <b>19.</b> | 3. There is evidence of good organizational learning (where the organization is tuned to identify and respond to structural change) (HSEd).  |   |
|                        | <b>20.</b> | 4. Extent to which the procedures address temporary as well as permanent modifications (including pilot projects) (OECD).  |   |
|                        | <b>21.</b> | 5. There is evidence of clear requirements for the updating of instructions/procedures and for information and training of employees before a modification is implemented (OECD).                          |   |
|                        | <b>22.</b> | 6. The extent to which the development of the change plan involves all the organization’s leaders, including the CEO, H&S representatives, supervisory staff, OHS coordinator, workers and unions (HCHSA). | 1. Number of Toolbox meetings where changes to the work environment (plant/ equipment/ process) are discussed.<br>2. Number of departments who  |



- |  |   |
|--|---|
| <p><b>23.</b> 7. There is evidence where proposed changes have been abandoned if it is found that safe operation is compromised.</p> <p><b>24.</b> 8. There is evidence of a review program after change is implemented.</p> | <p>record employee communications from the organization i.e. - Safety Alert - Changes to plant and equipment - Changes to the work environment - Change in process - Change in site rule - Cited Toolbox minutes - Change in Safe Work Practice.</p> <p>1. Organizational change policy document.</p> <p>2. Evidence of review after implementing change (HSEe).</p> <p>1. Number of new risks introduced from newly installed plant and equipment that requires plant change (OECD).</p> |
|--|---|

## 2. Process

## 3. Equipment

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## **SUCCESS FACTOR 4: QUALITY OF OHSMS**

### **DIMENSION A: LEARNING**

<b>Component</b>	<b>Indicator</b>	<b>Measurement Method</b>
<b>1. Audit</b>	<b>1.</b> 1. Extent to which the H&S program and safe work procedures have been monitored and evaluated to determine their effectiveness, revisions have been made, and evaluation data and program/procedure changes have been well-documented (HCHSA).	
	<b>2.</b> 2. The extent to which compliance with safety procedures is monitored (OECD).	
<b>2. Review</b>	<b>3.</b> 1. There is evidence of activities such as reviewing H&S policy, setting targets, monitoring achievement of targets, etc.	
	<b>4.</b> 2. Extent to which all aspects of operations are reviewed periodically with the involvement of operators (HSEe).	
	<b>5.</b> 3. There is evidence of H&S performance monitored in each site area, results and trends communicated to the entire site and improvement targets set (HSEe).	1. Number of OHSMP action items completed within allocated target.
		2. Number of safety meetings where OHSMS action items are reviewed.
		3. Number of departments that have set objectives for OHS improvement based on department specific risks.
		4. Number of departments that have determined their hazard register.
	<b>6.</b> 5. The H&S program and safe work procedures have been evaluated to determine their effectiveness (HCHSA).	
	<b>7.</b> 6. The extent to which revisions have been made, where required (HCHSA).	

- 8.** 7. There is evidence of well-documented evaluation data and program/procedure changes (HCHSA).
- 9.** 8. Extent to which reviews of H&S arrangements identify the current applicable national laws and regulations, national guidelines, tailored guidelines, voluntary schemes and other requirements to which the establishment subscribes (OECD).
- 10** 9. Extent to which the sites have the skills to be able to complete the assessment (HSEf).
- 11** 10. There is evidence of the evaluation of H&S compliance, accident statistics and work quality (HCHSA).
- 12** 11. There is evidence of the evaluation of general housekeeping, final cleanup and job completion (HCHSA).
- 13** 12. Extent to which senior managers seek feedback from personnel on health and safety issues (HSEa).

### 3. Proactive Planning

- 14** 1. Extent to which H&S activities are planned (CME).
  - 1. Number of sites/departments that have determined a H&S plan.
  - 2. Number of H&S activities consistent with required action in hazard register
  - 3. Number of activities determined to support the OHSMS
  - 4. Number of H&S activities that address major risks identified in hazard register (CME).
- 15** 2. Extent to which reviews of H&S arrangements determine whether planned or existing controls are adequate to eliminate hazards or control risks.

- 16** 3. Extent to which H&S planning arrangements include:
- i. a clear definition and priority setting of the organization's H&S objectives
  - ii. the preparation of a plan for achieving each objective, with defined responsibility and clear performance criteria indicating what is to be done by whom and when
  - iii. the selection of measurement criteria for confirming that the objectives are achieved
  - iv. the provision of adequate resources and technical support, as appropriate (ILOa).
  - v. identification of hazards, assessment and control of risks (CME).
- 17** 4. There is evidence of H&S performance monitored in each site area, results and trends communicated to the entire site and improvement targets set (HSEe).

#### **DIMENSION B: COHERENCE**

- |                                |   |
|--------------------------------|---|
| <b>1. Internal consistency</b> | <b>18</b> 1.  |
| <b>2. Incentive structure</b>  | <p><b>19</b> 2. Extent to which senior managers recognize and reward exemplary H&amp;S practices demonstrated by teams or individuals (HSEa).</p> <p><b>20</b> 3. There is evidence of incentives for employees to provide input or suggestions related to safety issues.</p> <p><b>21</b> 4. There is evidence of clear objectives and measures for each incentive program (OECD).</p> <p><b>2</b> 5. There is evidence of the incentive programs periodically reviewed to ensure they provide the benefit outlined by the scope and objectives of the program (OECD).</p> <p><b>2</b> 6. There is evidence of procedures within the incentive programs to ensure that the incentive program does not adversely effect regulations (OECD).</p> |

#### **DIMENSION C: SCOPE**

- |  |  |
|--|--|
| <b>1. Coverage of people, policies, contractors, suppliers, community, visitors, customers</b> | <p><b>24</b> 1. Extent to which the OSH management system contains the following main elements:</p> <ul style="list-style-type: none"> <li>i. OSH policy</li> <li>ii. establishment of responsibility and accountability, competence and training, documentation, communication and information</li> <li>iii. hazard and risk assessment, planning and implementation of OSH activities.</li> <li>iv. evaluation of OSH performance and action for improvement.</li> </ul> |
|--|--|

v. workers and their safety and health representatives are consulted, informed and trained on all aspects of OSH associated with their work, including emergency arrangements (ILOb).

**25** 2. There is evidence of the following key components incorporated in the H&S policy:

- i. the recruitment and training of personnel
- ii. the identification of those personnel who have been assigned specific responsibilities in the area of safety and health
- iii. the provision of equipment and substances in order to ensure a safe and healthy working environment
- iv. arrangements for liaison with other concerned bodies (legislators, workers' organizations, public utilities authorities, and organizations responsible for environmental conservation)
- v. the function and constitution of the H&S committee
- vi. procedures for the reporting of accidents, dangerous occurrences and occupational diseases
- vii. the means by which the policy will be communicated to all those involved including the date on which the policy will be reviewed and, as necessary, revised
- viii. emergency procedures (ILOb).
- ix. technology and design
- x. the role of checks, audits and management reviews (OECD).

**26** 3. Extent to which the H&S system include procedures, and as well as an iterative process for continuous improvement, including:

- i. planning
- ii. implementation and operation with control and corrective actions
- iii. audit, management review and feedback.

**27** 4. Extent to which employees are familiar with site H&S policy and performance (HSEe).

**28** 5. Extent of the level of knowledge of H&S procedures by the affected operators, managers and other categories of employees (OECD).

- 29** 7. Extent to which H&S planning supports:
- i. as the minimum, compliance with national laws and regulations
  - ii. the elements of the organization's OSH management system
  - iii. the continual improvement in OSH performance.

#### **DIMENSION D: COMPLIANCE**

- 1. Enforcement** **30** 1. There is evidence of an ongoing mechanism for assessing compliance with the H&S management system and improving H&S performance
- 31** 2. There is evidence of a means to ensure that H&S procedures are being implemented (OECD).
- 32** 3. Extent to which the decisions for ensuring and promoting H&S are applied as planned (HSEa).

#### **DIMENSION E: FUNCTIONALITY**

- 1. Clarity** **33** 1. There is evidence of a system to ensure that users are informed and have learned about changes in the H&S procedures (OECD).
- 34** 2. Extent to which feedback mechanisms are in place to inform staff about any decisions that are likely to affect them.(HSEa).
- 2. Accessibility** **35** 1. There is evidence of procedures for:
- i. receiving, documenting and responding appropriately to internal and external communications related to H&S
  - ii. ensuring the internal communication of obligatory or other H&S information between relevant levels and functions of the enterprise in the management framework; and
  - iii. ensuring that the concerns, ideas and inputs of workers and their representatives on H&S matters are received, considered and responded to (OECD).
- 36** 2. Extent to which all the H&S procedures in the system are documented, easily identifiable, easily obtainable and transmitted to the staff.
- 37** 3. There is evidence of systems for appraisal and feedback to employees that include H&S performance (OECD).
- 38** 4. There is evidence of a mechanism to ensure employees have access to all relevant H&S-related information (material safety data sheets, H&S instructions, etc.).

- 39** 5. Extent to which site and company H&S performance is communicated across all sites via company literature and improvement ideas transferred.
- 40** 6. There is evidence of systems in place to pass H&S information to the workforce (HSEa).
- 41** 2. There is evidence of techniques used by operators to regulate their workload and make monitoring more manageable, such as approving and scheduling work requests, in such a way that monitoring is not ignored or degraded (HSEe).

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## SUCCESS FACTOR 5: INCLUSION OF LONG-TERM HEALTH ISSUES

### DIMENSION A: SURVEILLANCE

Component	Indicator	Measurement Method
<b>1. Data collection</b>	<p><b>1.</b> 1. Extent to which documented procedures are established, implemented and maintained to monitor and measure the key characteristics of operations and activities that can cause illness and injury (Intergon).</p> <p><b>2.</b> 2. Extent to which the effectiveness of such measures are evaluated on a regular basis (Intergon).</p> <p><b>3.</b> 3. Extent to which the records of this process are retained according to the organization's procedures (Intergon).</p>	
<b>2. Trend analysis</b>	<p><b>4.</b> 1. Extent to which short- and long-term goals have been established to ensure protection of human health from the risks of accidents involving hazardous substances (Intergon).</p> <p>2. Extent to which occupational health management takes the following into account:</p> <ul style="list-style-type: none"> <li>- The potential interactions of humans, machines, processes and the work environment;</li> <li>- The various methodologies for exposure monitoring and assessment;</li> <li>- Life safety and emergency planning principles;</li> <li>- Medical surveillance methodologies for monitoring human health and well being;</li> <li>- Various methodologies for accident and incident investigations; and,</li> <li>- Various methodologies used to monitor occupational safety and health performance (AIHA).</li> </ul> <p><b>5.</b> 3. Extent to which specific objectives with measurable outcomes have been defined based on the short- and long-term goals for:</p> <ul style="list-style-type: none"> <li>• reducing accidents</li> <li>• reducing vulnerability zones and accident potential</li> <li>• improving emergency response and mitigation</li> <li>• improving prevention techniques</li> <li>• obtaining involvement of all stakeholders (OECD).</li> </ul> <p><b>6.</b> 4. Extent to which training has been provided (formally, informally, on the job, off the job) to increase employees' awareness of health hazards and ways to protect themselves against them (HSE OH).</p> <p><b>7.</b> 5. Extent to which an increased awareness of health hazards is required (HSE OH).</p> <p><b>8.</b> 6. Extent to which a more effective access to health professionals is required (HSE OH).</p> <p><b>9.</b> 7. Extent to which occupational health measures are taken in the</p>	

worksite including hazard/data sheets, PPE, health checks, manuals/instructions, formal training, notices about health hazards, pre-employment screening, stress counseling (HSE OH).

- 10** 8. Extent to which health professionals assume such roles as:
- Monitoring H&S procedures,
  - advising on H&S measures needed
  - identifying other areas which might cause health problems,
  - regular health checks for some staff,
  - attending H&S meetings,
  - implementing H&S procedures,
  - monitoring sickness absence records,
  - treating ill health/accidents (HSE OH)
- 11** 9. Extent to which occupational health measures are evaluated in terms of their effectiveness of the measures and identification of new ones (HSE OH).
- 12** 10. Extent to which situations are identified where employee health surveillance is required (CME).
- 13** 11. Extent to which employees' health is monitored and recorded when exposed to specific hazards (CME).
- 14** 12. Extent to which workers' health surveillance is linked to the surveillance of occupational hazards present at the workplace and appropriate to the site-specific risks (WHO).
- 15** 13. Extent to which the health surveillance plan is based on the analysis and prioritization of both immediate and long-term health risks and needs of the employees and company (WHO).
- 16** 14. Extent to which the occupational health protection and promotion needs are identified (WHO).
- 17** 15. Extent to which a written OH service plan is in place which is approved by the employer and employees (WHO).
- 18** 16. Extent to which the OH service input is evaluated based on:
- Resources (time, money, facilities, equipment, etc.);
  - Core services (preventive, health promotion, curative);
  - Other resources required (WHO).
- 19** 17. Extent to which OH service input is integrated in the every day management process of the company (WHO).
- 20** 18. Extent to which OH service plan is in place and updated (WHO).

#### **Dimension B: Control of identified problems**

- 21** 1. Extent of time between provision of information that an accident involving hazardous substances has occurred and response personnel arriving at the accident (OECD).
- 22** 2. Extent to which procedures are in place for monitoring and prevention of workplace accidents (HSE OH)
- 23** 3. Extent to which procedures and systems are in place for 7. reporting and recording: i) occupational accidents and diseases; and ii) dangerous occurrences and incidents that may present a serious danger to health.
- 24** 4. Extent to which all work related injuries, ill health, diseases, and incidents are investigated and communicated to the H&S committee.

- 25** 5. Extent to which the following information is reported for each significant occupational health risk:
  - Number of people exposed above the occupational exposure limit (not taking into account the protection provided by personal protective equipment)
  - The occupational exposure limit
  - The current exposure average and range (or other distribution indices)
  - Percentage compliance with personal protective equipment requirements
  - Numbers of people exposed to occupational physical and psychological stresses (HSE OH).
- 26** 6. Extent to which high-risk jobs and the high risk tasks within those jobs are identified and assessed (HSE OH).
- 27** 7. To motivate designers, manufacturers and suppliers to apply ergonomic principles in the design of work equipment, for example: tools, machines, furniture, etc. (HSE OH).
- 28** 8. Extent to which measures for the assessment for the control of substances hazardous to health are taken to protect employees' health (HSE OH).
- 29** 9. Extent to which the controls on working patterns are reviewed in light of experience (HSE).
- 30** 10. Extent to which employees are able to report concerns they have about fatigue of themselves or others (HSE).
- 31** 11. Extent to which it is recognized that employees may require additional rest days after periods of exceptional workload and flexibility is built in the restoring system to enable this to occur (HSE).
- 32** 12. The extent to which the control of medication is reviewed in light of experience (including health monitoring) (HSE).
- 33** 13. Extent to which manuals or instructions are issued which cover health hazards (HSE OH).

**Dimension C: Identification of emerging problems**

- 34** 1. Extent to which an OH service is place for the identification and assessment of the risks from health hazards in the workplace (ILO).
- 35** 2. Extent to which ill health (including work-related diseases, accidents, injuries, occupational diseases, and stress) are identified and prevented (WHO1).
- 36** 3. The extent to which the identification of hazards in the workplace take into account the following:
  - the situation or events or combination of circumstances that has the potential to give rise to injury or illness;
  - the nature of the potential injury or illness relevant to the activity, product or service.;
  - past injuries, incidents and illnesses (Intergon).
- 37** 4. Extent to which appropriate equipment for monitoring and

measurement related to health risks are identified, calibrated, maintained and stored as necessary (Intergon).

- 38** 5. Extent to which the records of the process are retained according to the organization's procedures (Intergon).
- 39** 6. Extent to which practical ways are in place to encourage development, provision and uptake of occupational health support and to improve the knowledge about work-related health risks such as respiratory sensitisation, MSD, hand-arm vibration and stress (HSE OHS).
- 40** 7. The extent to which measures are taken for regular health checks. (HSE OH).
- 41** 8. Extent to which measures are taken for providing stress counseling (HSE OH).

#### **Dimension D: OHS service quality**

- 42** 1. Extent to which the occupational health services cover the following functions as adequate and appropriate to the occupational risks of the undertaking.
- 43** 2. Extent to which the surveillance of the factors is in place that will examine the working environment and working practices which may affect workers' health (ILO).
- 44** 3. Extent to which advice is provided on occupational health, safety and hygiene and on ergonomics and individual and collective protective equipment (ILO).
- 45** 4. Extent to which the surveillance program promotes the adaptation of work to the worker (ILO).
- 46** 5. Extent to which the surveillance program collaborates in providing information, training and education in the fields of occupational health and hygiene and ergonomics (ILO)
- 47** 6. Extent to which the surveillance program provides participation in analysis of occupational accidents and occupational diseases (ILO) .
- 48** 7. Extent to which occupational health services are informed of occurrences of ill health amongst workers and absence from work for health reasons, in order to be able to identify whether there is any relation between the reasons for ill health or absence and any health hazards which may be present at the workplace (ILO).
- 49** 8. Extent to which occupational health services include the following:
  - individual and collective health assessments
  - occupational injury recording and notification, sentinel event
  - notification, surveys, investigations and inspections;
  - causes of negative work-related health effects, by identifying the causative physical, behavioral, organizational, psychological and occupational exposure factors
  - predict the occurrence of work-related adverse health effects and have early warning capabilities
  - assess the effectiveness of previously implemented control measures

provide guidance on company occupational health and safety policies and programs.

- 50** 9. Extent to which medical examinations are carried out for the assessment of individual workers:
- when an employee starts such work;
  - when work task or conditions change essentially;
  - after periods of illness affecting the employee's work ability;
  - when placing at work an employee with deficient work capacity.
- <http://www.euro.who.int/document/e77650.pdf> (WHO)
- 51** 10. Extent to which the following factors are taken into consideration in waiting times:
- Turnaround times;
  - Complaints management;
  - Practice Guidelines, protocols, policies and work instructions;
  - Access (WHO)
- 52** 11. Extent to which health surveillance activities include the following:
- Work environment surveillance including surveys and monitoring programs
  - New employment health examinations
  - Risk assessments of occupational health hazards;
  - Assessments of environmental health hazards and their health impact
  - Needs assessment
  - Ergonomic assessments
  - Workplace Health Promotion Programs
  - Sickness absence management
  - Workplace stress (WHO)
- 53** 12. Extent to which health promotion needs are assessed, and the activities carried out towards meeting them are evaluated. (SF5).
- 54** 13. Extent to which occupational health professionals of the OHS provide comprehensive health care (prevention, rehabilitation, treatment, compensation) (WHO).
- 55** 14. Extent to which occupational health professionals of OHS establish links between the workers' health surveillance targeted at specific hazards, specific diseases in particular groups of workers, workplace health promotion programs, and research in occupational health. (WHO)

#### **Dimension E: Case management**

- 1. Return to work**      **56** 1.

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## APPENDIX E2

### **Explanatory Notes**

1. This is the list of documents that emerged out of the discussions during SafetyNet/IOC Workshop, August 15-16, 2006.
2. The list has been edited by the Memorial University research team.
3. The items currently designated as ‘core’ indicators will be included in this year’s pilot project as well as all subsequent evaluations. The core indicators are shaded in this document.
4. Success Factor 1 (Employer and Employee Roles) has been split into Success Factors 1a & 1b, for clarity.
5. At present, there are 36 indicators designated as ‘core’ items. The number of core and rotating indicators for each Success Factor are given in the table below:

<b>Success Factors</b>	<b>Core Indicators</b>	<b>Rotating Indicators</b>	<b>Total</b>
1.a. Employer Roles	10	15	<b>25</b>
1.b. Employee Roles	5	3	<b>8</b>
2. Hazard Management	4	0	<b>4</b>
3. Integration	5	2	<b>7</b>
4. Quality of OHSMS	6	3	<b>9</b>
5. Long-Term Health Issues	5	4	<b>9</b>
<b>Total</b>	<b>35</b>	<b>27</b>	<b>62</b>

<b>SUCCESS FACTOR 1A      EMPLOYER ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)</b>		
<b>SUB-DIMENSION 1      EMPLOYER RESPONSIBILITY/COMMITMENT</b>		
<b>COMPONENT</b>	<b>INDICATOR</b>	<b>MEASUREMENT METHOD</b>
<b>1. Management supports, and is consistent with, mission and values</b>	<b>a. (Management behavior)</b>	
	<b>1. P I E</b> Management provides adequate supervision of work; of work practices; and of the application and use of H&S measures (ILOb). This includes encouraging operational personnel to identify and report hazards.	Questionnaire/ Focus Groups/ Documents
	<b>2. I</b> Senior and middle managers provide regular health and safety briefings to operational personnel and to executives at Board level (HSEa).	Documents
	<b>3. I</b> Management encourages open communication processes for raising occupational health and safety issues (worksafe).	Focus Groups Ability of all employees to take actions involving H&S, including T5s, without fear of negative consequences (OECD).
<b>2. Management's responsibility/ commitment toward providing sufficient resources</b>	<b>a. (Provision of adequate service and support to skilled people)</b>	
	<b>4. I</b> Managers and supervisors coach their teams to work safely.	Documents; Focus Groups
	<b>5. P I E</b> Management provides employees with the mechanisms, time and resources necessary to participate effectively in key H&S processes (training, planning, implementation, evaluation, corrective and preventive action).	Documents; Focus Groups
	<b>b. (Money)</b>	<b>(Sufficient/adequate)</b>
	<b>6. I E</b> Senior management responds to problems and concerns by providing necessary budgetary resources (HSE).	Provision of adequate funding in budget documents
<b>3. Appropriate training for competence</b>	<b>a. (Training for everyone)</b>	
	<b>7. P</b> Training, including induction training, is provided to all participants at no cost and takes place during working hours where possible (ILO:8).	Documents



	<b>8. I</b>	Training programs, including H&S training, are designed for all categories of employees including: <ul style="list-style-type: none"> <li>- Orientation training of all staff</li> <li>- Job training for workers including initial position, major changes in job, and promotions</li> <li>- Job training for managers and supervisors</li> <li>- Specific and/or technical training, as appropriate</li> <li>- Training of contractors and contractual employees, including induction, and</li> <li>- Other categories, including visitors, as appropriate.</li> </ul>	Documents: <ul style="list-style-type: none"> <li>• Number of training courses given and received by senior management (HSEb).</li> <li>• Number of managers who have attended OHS leadership training (CME).</li> <li>• Number of employees attending specific training courses per month/quarter/year</li> <li>• Number of induction programs for contractors.</li> </ul>
	<b>9. I</b>	Management ensures that the training is carried out by persons with appropriate knowledge, skills and experience in OHS and training (Worksafe).	Documents (tenders), Organization Charts
	<b>10. E</b>	Mechanisms, including feed-back from employees, are in place to ensure that the scope, content and quality of the training programs are adequate,	Documents: <ul style="list-style-type: none"> <li>• Number of OHS training courses assessed for effectiveness and appropriateness.</li> <li>• Course Evaluation, Percentage of OHS training courses rated satisfactory or higher for effectiveness and appropriateness by the workforce (CME).</li> </ul> Questionnaire; Focus Groups;
	<b>11. I</b>	Training programs are reviewed following emergency drills and following incidents(OECD).	Documents
<b>4. Employer recognizes the</b>	<b>a. (Productivity)</b>		<b>(Scheduling)</b>

impact of work organization and operations	<b>12. P I</b>	Management ensures that work organization does not put production over safety (ILOb).	Focus Groups Documents: minutes, job descriptions, performance evaluations, schedules H&S takes priority in cases where there is a conflict between H&S and operational goals (OECD). The relative importance of H&S, compared to productivity, is communicated (HSEh).
	<b>b. (Short and long-term impacts of shift work on H&amp;S)</b>		<b>(Overtime)</b>
	<b>13. P</b>	Management considers H&S implications of decisions about shift patterns and overtime, including the type of work and worker involved (HSEh).	Focus Groups; Documents: HR procedures, operating procedures; scheduling records, calculation of TLV values for long shifts
	<b>14.</b>	OHS information is exchanged between work groups on shift change.	Documents: Number of departments where there is a formal handover between shifts/shift swings (CME).
	<b>c. (Appropriate staffing levels)</b>		
	<b>15. P</b>	Management evaluates staffing arrangements in terms of H&S, taking into account all required tasks, peaks and troughs (HSE).	Focus Groups; Documents
5. Auditing	<b>a. (OHSMS auditing)</b>		
	<b>16. P</b>	Senior management and the Board regularly review the company's H&S performance (HSE).	Documents
	<b>17. I</b>	Informal audits of site activities are conducted by OHS specialists.	Documents
	<b>18. E</b>	Levels of worker involvement and management commitment are evaluated in the audit.	Documents
	<b>19. I</b>	Employee feedback is a feature of the audit process.	Documents: audit instrument

SUCCESS FACTOR 1A				EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)	
SUB-DIMENSION 2. EMPLOYER PARTICIPATION					
COMPONENT		INDICATOR		MEASUREMENT METHOD	
1. Participation of management in safety tours	20. I	Managers participate in safety tours and other visible H&S activities (OECD).		<u>Documents:</u> <ul style="list-style-type: none"><li><u>Number of safety tours and hours spent by senior management (HSEb).</u></li><li><u>Number of scheduled H&amp;S briefings requested by senior management. (HSE Review of safety culture)</u></li></ul> Focus Groups: Management visibility in daily operations (daily/weekly).	
	21. E	Senior managers pay timely attention to the items identified through safety tours.		Documents: Percentage of issues identified on safety walks that are remedied (NOHSCb). Documents: The proportion of items identified through safety walks that are repeat items, measured over a specified time period.	
2. Positive participation of management in safety interaction with employees	a. (All management)		Documents: performance reports and evaluations, number of management’s regular personal contacts with H&S representatives		
			Documents: Number of management’s formal contacts with contractors on H & S issues		
	22. E	Management at all levels seeks feedback from the ground up on OHS issues.		Focus Groups; Documents: Number of open meetings held by management.	

	<b>23. P</b>	Management provides health and safety representative(s) with copies of the results of any reports in their possession concerning OHS (HCHSA).	Focus Groups; Documents
	<b>24. I</b>	Managers share good practice or learning from incidents through Intranets and open meetings (HSEa).	Documents

<b>3. Participation of management in incident reviews</b>	<b>a. (Senior management presence)</b>		
	<b>25. I</b>	Managers take part in follow-up of incidents, chair serious incident investigations, and report the findings (HSEa ; OECD).	Documents: Percentage of managers leading an incident investigation. Documents

<b>SUCCESS FACTOR 1B EMPLOYEE ROLES (COMMITMENT / RESPONSIBILITY, PARTICIPATION)</b>			
<b>SUB-DIMENSION 1. EMPLOYEE RESPONSIBILITY/COMMITMENT</b>			
<b>COMPONENT</b>	<b>INDICATOR</b>		<b>MEASUREMENT METHOD</b>
<b>1. Duty to follow OHS regulations as well as company standards and procedures</b>	<b>26. E</b>	Employees are aware of relevant OSH regulations and company standards and procedures pertinent to their jobs, comply with these, and accept a personal responsibility to protect themselves and others (HSEa).	Questionnaire; Two Focus Groups- Team leaders and workers
<b>2. Working safely</b>	<b>27. I</b>	Personal risk assessments (Take 5s) are carried out regularly.	Questionnaire; Focus Groups; Docs
	<b>28. E</b>	Employees are able to identify hazards in the workplace.	Questionnaire Focus Groups, including effectiveness of T5s. Focus Group
	<b>29. I</b>	Employees communicate hazards and related H&S concerns, ideas and suggestions to those with authority to take action, and take action personally when it is within their sphere of control.	Focus Group  Employees inform a supervisor of any H&S hazards or system deficiencies in the workplace (AIHA). Employees make recommendations regarding possible hazard control and reporting procedures (ANSI). Extent to which employees use near-miss reporting practices (HSEb).
<b>3. Co-worker care</b>	<b>30. E</b>	Employees feel comfortable talking to fellow workers about their work practices.	Questionnaire; Focus Groups including JOSH, on safety culture
<b>4. Competence</b>	<b>31. I</b>	Employees have a clear understanding of their job tasks.	Questionnaire, Focus Groups (supervisors)
	<b>32. E</b>	Employees raise concerns about job assignments when they doubt their competence in both normal and unusual circumstances or in cases of increased workload (OECD).	Focus Groups: JOSH and employees

SUCCESS FACTOR 1B EMPLOYER AND EMPLOYEE ROLES (COMMITMENT/RESPONSIBILITY, PARTICIPATION)		
SUB-DIMENSION 2. EMPLOYEE PARTICIPATION		
COMPONENT	INDICATOR	
1.Communication and Engagement	33. <b>E</b>	<u>Employees are actively involved in safety discussions at crew meetings and regular safety talks.</u>
		Docs; 2 Focus Groups; 1 employees; 1 supervisors/managers

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<b>SUCCESS FACTOR 2      EFFECTIVE HAZARD MANAGEMENT</b>			
<b>COMPONENT</b>	<b>INDICATOR</b>		<b>MEASUREMENT METHOD</b>
<b>1. Program</b>	<b>34. P</b>	Hazard identification and risk management processes based on the hierarchy of controls are in place and they are appropriate to the potential consequences of each hazard.	
<b>2. Participation</b>	<b>35. I</b>	Hazard identification and risk management processes involve both technical personnel and the employees exposed to the hazard.	
	<b>36. I</b>	The outcomes of review, audits, hazard identification and risk management activities are documented and implemented, and processes are in place to track corrective actions.	
<b>3. Review</b>	<b>37. E</b>	Processes are in place for regular review of risk registers to ensure that the underlying causes have been identified and the hierarchy of controls has been effectively applied.	

<b>SUCCESS FACTOR 3: INTEGRATION OF OHS INTO GENERAL MANAGEMENT SYSTEM (CHANGE MANAGEMENT AND ORGANIZATIONAL FACTORS)</b>			
<b>DIMENSION A: CONCEPTUALIZATION AND DESIGN</b>			
<b>Component</b>	<b>Indicator</b>		<b>Measurement Method</b>
<b>1. Health and safety are taken into account in design and engineering of processes, equipment, and work planning</b>	<b>38. I</b>	Experience of employees is taken into consideration in the design and engineering of work processes and products to ensure H&S (OECD).	FG; Doc (RA of projects)
	<b>39. I</b>	H&S hazards are identified and risks are addressed in the design, planning and procurement phases and activities of all new projects (NOHSCb).	1. Percentage of design changes required as a result of OHS problems, calculated over a specified time frame. 2. Percentage of incidents where poor design was a root cause, calculated over a specified time frame. (OECD) 3. Number of instances where design changes are made to address identified OHS issues over the life of the project. 4. Number of instances where changes are made to planning and scheduling to address identified OHS issues over the life of the project. 5. Percentage of incidents where poor design was a factor, calculated over a specified time frame.
<b>DIMENSION B: OPERATION AND MAINTENANCE</b>			
<b>1. Integrity of Equipment and Facilities</b>	<b>40. P</b>	A. Specific safety procedures are in place for critical safety activities such as equipment lock-out, confined space entry, bypassing safety critical systems, etc.	
	<b>I</b>	B. These procedures are consistently followed. (OECD).	



	<b>41. P E</b>	A comprehensive preventive maintenance program is in place and is regularly audited (OECD).	<p>1. Number of newly purchased plant/ equipment being entered into preventative maintenance plan.</p> <p>2. Number of departments that have a preventative maintenance program in place for equipment and/or machinery (CME).</p> <p>3. Percentage of operators who carry out preventive maintenance and breakdown maintenance in their day to day operations (CRR).</p> <p>There is evidence of the existence of, and compliance with, a procedure for checking that the equipment is maintained according to the specified engineering documentation, following all the mandatory requirements and additional internal requirements (OECD).</p>
<b>2. Ownership/ Responsibility</b>	<b>42. I</b>	All aspects of operations are reviewed periodically with the involvement of employees with a view to ensuring H&S (HSEe).	
<b>3. Process safety</b>	<b>43. P</b>	Safety instructions are integrated in all operating instructions (OECD).	
<b>DIMENSION C: MANAGEMENT OF CHANGE</b>			
<b>1. Organization</b>	<b>44. P</b>	There is a comprehensive change management program in place that integrates H&S considerations in all forms of change, including equipment, plant, work organization, procedural and information systems, and findings are regularly communicated to those potentially affected by the changes.	

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HSEa: Ernst & Young, Development of a Leadership Resource Pack development of H&S measurement tool, Offshore Technology Report, 2000/098.

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<b>SUCCESS FACTOR 4: QUALITY OF OHSMS</b>			
<b>DIMENSION A: MONITORING</b>			
<b>Component</b>	<b>Indicator</b>		<b>Measurement Method</b>
<b>1. Review</b>	<b>45. P</b>	Regular reviews of OHMS are planned and implemented, covering all aspects of the safety system.	
	<b>46. I</b>	Employees are actively involved in the review process.	
	<b>47. E</b>	Results of all reviews and implementation processes are communicated to all employees and improvement targets are set.	
<b>2. Audit</b>	<b>48. P</b>	Regular audits examine compliance of the H&S system with all internal policies, standards, and procedures as well as all currently applicable laws, regulations, guidelines, and voluntary schemes (OECD).	
<b>3. Continuous improvement</b>	<b>49. P</b>	Processes are in place to ensure that emerging H&S trends and developments are reviewed and that existing controls are adequate to eliminate hazards or control risks.	
	<b>50. I</b>	There is a process that encourages all employees to behave in a healthy and safe manner and to suggest H&S improvements.	
	<b>51. I</b>	There is a process in place to review the H&S impact of all reward and recognition schemes.	
	<b>52. I E</b>	There is an effective system for mentoring new employees or employees changing roles to ensure optimal H&S performance.	
<b>DIMENSION B: SCOPE</b>			
<b>1. Coverage</b>	<b>53. P</b>	1. The HSMS is comprehensive, covering employees, contractors, suppliers, community, visitors and customers.	

**References:**

HCHSA. Roles & Responsibilities in Occupational Health & Safety. by Health Care Health & Safety Association of Ontario.

HSEa: Ernst & Young, Development of a Leadership Resource Pack development of H&S measurement tool, Offshore Technology Report, 2000/098.

HSEb: Vicki Scotney. Development of H&S performance measurement tool. Contract Research Report 309/2000.

HSEc: Organizational changes and major accident hazards. Chemical information sheet No. CHIS7

HSEd: Michael S Wright, Philip Brabazon, Alison Tipping and Medha Talwalkar. Development of a business excellence model of safety culture.

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NOHSCb: Extending the Use of OHS Positive Performance Indicators in Australian Industry. National Occupational Health and Safety Commission

<b>SUCCESS FACTOR 5: INCLUSION OF LONG-TERM HEALTH ISSUES</b>		
<b>DIMENSION A: IDENTIFICATION, EVALUATION &amp; CONTROL</b>		
<b>Indicator</b>		<b>Measurement Method</b>
<b>54. P</b>	A program of exposure monitoring and health surveillance is in place under the supervision of appropriately qualified personnel and based on recognized standards and monitoring methods for the identification and assessment of health hazards in the workplace.	
<b>55. E</b>	Processes are in place to respond to concerns raised by the health surveillance or exposure monitoring program in accordance with the hierarchy of controls. These processes are regularly reviewed for effectiveness.	
<b>56. I</b>	Programs are available to help employees deal with issues involving fatigue, addiction, impairment and similar issues.	
<b>57. I</b>	Wellness programs are available to all employees.	
<b>58. E</b>	Emerging health issues are monitored and addressed as appropriate.	
<b>59. I</b>	There is a process for managing illness cases and for providing support for return to work.	
<b>60. E</b>	Employees are made aware of the health risks of their work and receive appropriate training.	
<b>61. P</b>	Health concerns are fed back to equipment manufacturers and suppliers as appropriate.	
<b>62. I</b>	Occupational health records are maintained in accordance with best practice standards.	

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## APPENDIX F1

Please read the following questionnaire concerning the management of health and safety (H&S) at IOC and circle what you feel to be the appropriate answer for each question.

Section One: This section considers the employer's role in H&S management.					
Does management encourage employees to identify hazards?	not at all	some of the time	about half of the time	most of the time	all of the time
Does management encourage employees to report hazards?	not at all	some of the time	about half of the time	most of the time	all of the time
Does management provide feedback to employees on how to work safely?	not at all	some of the time	about half of the time	most of the time	all of the time
Does management provide employees with the mechanisms, time and resources necessary to participate effectively in the following key H&S processes?					
• planning	not at all	some of the time	about half of the time	most of the time	all of the time
• training	not at all	some of the time	about half of the time	most of the time	all of the time
• implementation	not at all	some of the time	about half of the time	most of the time	all of the time
• evaluation	not at all	some of the time	about half of the time	most of the time	all of the time
• corrective action	not at all	some of the time	about half of the time	most of the time	all of the time
• preventive action	not at all	some of the time	about half of the time	most of the time	all of the time
Does management participate in H&S tours and other visible H&S activities?	not at all	some of the time	about half of the time	most of the time	all of the time
Does management at all levels seek feedback from the ground up on H&S issues?	not at all	some of the time	about half of the time	most of the time	all of the time
Does management provide adequate supervision of work practices?	not at all	some of the time	about half of the time	most of the time	all of the time

Does management apply H&S measures adequately?	not at all	some of the time	about half of the time	most of the time	all of the time
Please feel free to provide more detail to explain your answers to any of the questions in Section One.					
<hr/>					
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Section Two: This section considers the employees' role in workplace H&S.					
Employees feel comfortable talking to fellow workers about their work practices.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
Please feel free to provide more detail to explain your answer.					
<hr/>					
<hr/>					
Section Three: This section asks about effective hazard management.					
Appropriate remedial action is taken when hazards have been identified.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
This remedial action is taken in a timely fashion.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
Section Four: This section is concerned with the integration of H&S into general management.					
H&S hazards are regularly identified in the following areas:					
• Design	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Planning	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Procurement	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Operation of all new projects	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree



H&S risks are regularly addressed in the following areas:					
• Design	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Planning	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Procurement	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Operation of all new projects	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
Specific safety procedures are in place for critical safety activities, such as equipment lock-out, confined space entry, bypassing safety critical systems, etc.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
These critical safety procedures are consistently followed.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
Please feel free to provide more detail to explain your answer.					
<hr/>					
<hr/>					
There is a comprehensive change management program in place.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
The change management program addresses H&S considerations in the following areas:					
• Equipment	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Plant	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Work organization	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
• Procedural and information systems	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
Any H&S considerations in these areas are regularly communicated to those potentially affected by the changes.	strongly disagree	moderately disagree	uncertain	moderately agree	strongly agree
<b>Section Five: This section considers the quality of the occupational health and safety management system (OHSMS).</b>					
Are the results of all reviews of the OHSMS communicated to all employees?	not at all	some of the time	about half of the time	most of the time	all of the time
Are improvement targets set?	not at all	some of the time	about half of the time	most of the time	all of the time

Once improvement targets are set, are they tracked and communicated to all employees?	not at all	some of the time	about half of the time	most of the time	all of the time
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Section Six: This section is concerned with the inclusion of long-term health issues.

There is an effective process for managing illness cases, including providing support for return to work.	not at all effective	not very effective	uncertain	somewhat effective	very effective
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Please feel free to provide more detail to explain your answer.

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Section Seven: In order to better understand the questionnaire information, we would like to ask you these additional questions.

Please indicate your category of employment.

☐ unionized  
☐ staff

Please indicate your worksite.

☐ primary ore  
☐ product management  
☐ engineering and central services  
☐ administration

Please indicate your length of employment at IOC.

☐ less than 5 years  
☐ between 6 and 15 years  
☐ more than 15 years

## APPENDIX F2

### **SafetyNet Project 2b.**

### **Consensus-based evaluation of safety management systems: A model and pilot study in iron ore mining in Newfoundland and Labrador**

#### **Focus Group Protocol for the Pilot Study at IOC, Labrador City, October 10 to 13 2006**

Eleven focus groups were conducted in total, organized along functional lines. Two each were held for employees from the concentrator, mill and mine, and one from the central service division. Also, one each was held with middle managers (supervisors and safety superintendents), general managers, safety specialists and members of the USWA Local 5795 Executive.

#### Questions:

Employee and Local 5795 focus groups: Please think about and answer the following questions, based on your experience and knowledge at work:





1. [Indicator 3] Does management encourage open communication processes for raising H&S issues?
2. [13] Does management consider H&S implications of decisions about shift patterns and overtime, including type of work and worker involved?
3. [28] Are employees able to identify hazards in the workplace?
4. [36] Is appropriate remedial action taken in a timely fashion when hazards have been identified?
5. [38] Are you familiar with the term “hierarchy of controls”? [If not, explain.] Once risks are registered, are they reviewed to ensure that the underlying causes have been identified and that the hierarchy of controls has been effectively applied?
6. [39] Is the experience of employees taken into consideration in the design and engineering of work processes and products, to ensure H&S?
7. [42] Is there a comprehensive preventive maintenance program?
8. [51] Is there a process that encourages all employees to behave in a healthy and safe manner and to suggest H&S improvements?
9. [53] Is there an effective system for mentoring new employees or employees changing jobs, to ensure H&S?
10. [56] Are concerns raised by monitoring health and exposure at work responded to according to the hierarchy of controls?

Management focus groups: Please think about and answer the following questions, based on your experience and knowledge at work:



1. [26] Are employees aware of OSH regulations and company standards and procedures pertinent to their jobs?
2. [26] Do they comply with these?
3. [26] Do they accept a personal responsibility to protect themselves and others?
4. [28] Are employees able to identify hazards in the workplace?
5. [29] Do employees communicate hazards and related H&S concerns, ideas and suggestions to those with authority to take action?

6. [32] Do employees raise concerns about job assignments when they doubt their competence in both normal and unusual circumstances or in cases of increased workload?
7. [51] Is there a process that encourages all employees to behave in a healthy and safe manner and to suggest H&S improvements?
8. [56] Are concerns raised by monitoring health and exposure at work responded to according to the hierarchy of controls?
9. [36] Is appropriate remedial action taken in a timely fashion when hazards have been identified?
10. [3] Does management encourage open communication processes for raising H&S issues?





## SafetyNet Project 2B Evaluation Tool Results




 Strength	 Needs Attention
 Discussion Required	 OK Core Indicator

Type of Indicator	Meaning	
Strength	Scores on all sources of evidence used (documents / questionnaire / focus groups) averaged 4.0 or more out of 5.0	7
Needs Attention	Scores on all sources of evidence used averaged less than 2.5	3
OK Core Indicator	Indicator score averages between 2.6 and 3.9	6
Discussion required	Insufficient documentation; or strong discrepancy between scores from different sources; or wording of question needs clarification	20

Indicator	Documentary Evidence	Questionnaire	Focus Groups	Overall	Interpretation/Comments	
Section 1: Employer Roles						
1. Management provides adequate supervision of work; of work practices; and of the application and use of H&S measures. This includes encouraging operational personnel to identify and report hazards.	5/5 Documents indicate multiple activities including planned general inspections, "take 5s", safety interactions, safety tours, risk registers, and safety workshops.	3.65/5		4.3/5		
3. Management encourages open communication processes for raising occupational health and safety issues.	5/5 Safety interactions, workshops, and safety meetings.		2/5 The formal structures and processes appear to be in place but organizational barriers prevent them from working effectively in practice to encourage open communication. These include long delays in remedial action, a production imperative and a focus on the individual worker behaviour model of health and safety.	3.5/5	<b>Discrepancy</b> between the evidence found in documentation and that of the focus groups.	

## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





4. Managers and supervisors coach their teams to work safely.	5/5 Safety Interactions; 1-minute Safety Talks; Risk Assessment—Group Discussions; Safety Interactions	3.47/5		4.2/5		
5. Management provides employees with the mechanisms, time and resources necessary to participate effectively in key H&S processes (training, planning, implementation, evaluation, corrective and preventive action).	4.5/5 Take 5's; Safety Meetings, Continuous Improvement Programs, Training Programs, Orientation Package	3.02/5		3.76/5		
10. Mechanisms, including feed-back from employees, are in place to ensure that the scope, content and quality of the training programs are adequate.	Documents include only employee feedback on satisfaction but nothing else on content, scope and quality.			?	Documentation insufficient to support rating for this indicator.	


## SafetyNet Project 2B Evaluation Tool Results

Strength	Needs Attention
Discussion Required	OK Core Indicator

13. Management considers H&S implications of decisions about shift patterns and overtime, including the type of work and worker involved.	1/5? No documentation other than legislation and hours, nothing on linkage between hours worked and HS.		2/5 Management gives insufficient consideration to the health and safety implications of shift-work decisions, relying too much on the voluntary nature (and monetary reward) of overtime to justify long term fatigue-inducing patterns of work. Their overriding reliance on the worker behaviour model of H & S means that in effect all the onus is on the worker.	1.5/5	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator</li> <li><b>Discrepancy</b> between the evidence found in documentation and that of the focus groups suggests a gap between what's on paper and actual practice.</li> </ul>	
17. Informal audits of site activities are conducted by OHS specialists.	Poorly worded question? How can informal audits be tracked?			?	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support evaluation of informal audits procedures.</li> <li><b>Wording</b> of indicator.</li> </ul>	
20. Managers participate in safety tours and other visible H&S activities.	4.5/5 General Tours plus Safety Interactions, workshops, etc.	3.32/5		3.91/5		
22. Management at all levels seeks feedback from the ground up on OHS issues.	Are these workshops repeated? How often? What levels of mgt. participated in the workshops? Any other documentation on other attempts to seek feedback? Wording: is 'all levels' good wording? Realistic?	2.85/5		?	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator</li> <li><b>Wording</b> of indicator.</li> </ul>	





## SafetyNet Project 2B Evaluation Tool Results



	Strength		Needs Attention
	Discussion Required		OK Core Indicator

25. Managers take part in follow-up of incidents, chair serious incident investigations, and report the findings.	Are there any other docs to show mgt leadership in investigation? What level of mgt is involved? Who chairs? Are results reported to work force? Wording: should it say 'senior' management? 'Report': is this necessary? if so, report to whom?				<ul style="list-style-type: none"> <li>• <b>Documentation</b> insufficient to support rating for this indicator</li> <li>• <b>Wording</b> of indicator.</li> </ul>	
26. Employees are aware of relevant OSH regulations and company standards and procedures pertinent to their jobs, comply with these, and accept a personal responsibility to protect themselves and others.			3.75/5 Employees are largely aware of standards, procedures, and OSH regulations pertaining to their job, they mostly comply with them, and they mostly take responsibility for their own and others' safety. However, a small percentage does not comply due to varying risk perceptions.	3.75/5		
28. Employees are able to identify hazards in the workplace.			3.75/5 Employees have the ability to identify hazards. A small minority apparently does not have this ability; this may be due to a risk perception lower than management's. However, the employees' ability to formally identify hazards is impeded by organizational barriers that deter accurate reporting to management. Moreover, some employees cannot identify a hazard because they	3.75/5		








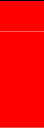


## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator

			do not have enough information on various combinations of chemical and dust exposure to clearly decide whether a particular work process is hazardous or not. This latter observation has implications for the employees' right to know and is a matter for employer not employee roles.			
29. Employees communicate hazards and related H&S concerns, ideas and suggestions to those with authority to take action, and take action personally when it is within their sphere of control.	Other than those who got Spot awards, are there any docs to show other workers communicating hazards and ideas? Spot Awards: how many per year? How many years has program run? Continuous Improvement Program: where? How comprehensive? How long?		3.5/5 The majority of workers do communicate hazards and related OHS concerns, ideas and suggestions to those with authority to take action. Reasons for any lack in reporting to management largely reflect the traditional employee culture, including long established work practices and a reluctance to report co-workers. In addition, there is the deterrent effect of long delays in remedial action.	?	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator</li> </ul>	
30. Employees feel comfortable talking to fellow workers about their work practices.		3.81/5		3.81/5		
32. Employees raise concerns about job assignments when they doubt their competence in both normal and unusual circumstances or in cases of increased workload.			3/5 Workers do not on the whole raise concerns about their competence to do a job due to their work ethic, monetary advantage in the case of overtime and job insecurity for students.	3/5		

## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





Section 2: Hazard Management						
34. Hazard identification and risk management processes based on the hierarchy of controls are in place and they are appropriate to the potential consequences of each hazard.	Documents only are insufficient to assess questions especially about hierarchy of controls and 'appropriateness' to consequences. Risk Assessment Powerpoint doesn't contain much on hierarchy of controls			?	Wording	
35. Hazard identification and risk management processes involve both technical personnel and the employees exposed to the hazard	2/5 Documents don't indicate any shopfloor participation			2/5		
36. Appropriate remedial action is taken in a timely fashion when hazards have been identified.	3/5* Wording: 'appropriate' not needed because examined in indicator 34	3.53/5	1.5/5 Even taking into account the complexities of the prioritization process, based on the employee/union focus groups, remedial action is not taken in a timely fashion once a hazard has been identified if it does not affect production.	2.67/5	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator.</li> <li><b>Discrepancy:</b> Focus group input points to a potential weakness of remedial action for hazards.</li> </ul>	
37 The outcomes of review, audits, hazard identification and risk management activities are documented and implemented, and processes are in place to track corrective actions.	Wording problem; does tracking component overlap with 36?; indicator is too complicated and needs to be reduced to focus on implementation of results of reviews and audits.			?	Wording	
Section 3: Integration of OHS into General Management System						



## SafetyNet Project 2B Evaluation Tool Results

Strength	Needs Attention
Discussion Required	OK Core Indicator





38. Processes are in place for regular review of risk registers to ensure that the underlying causes have been identified and the hierarchy of controls has been effectively applied.	Is it necessary to focus on risk registers as compare to hazard identification more broadly as in indicator 34? Does 38 overlap with hierarchy of controls component of Indicator 34? Should we rather focus on the question of underlying causes?		2/5 Processes appear to be in place for investigation to the level of underlying causes and for the application of the hierarchy of controls, but most groups observed a strong tendency to identify worker behaviour as the underlying cause and not investigate beyond this level, as well as a predominant reliance on PPEs rather than engineering hazards out.	?	<ul style="list-style-type: none"> <li>• <b>Wording</b> of indicator</li> <li>• Possible <b>Overlap</b> with other indicators</li> </ul>	
39. Experience of employees is taken into consideration in the design and engineering of work processes and products to ensure H&S.	5/5 Based on Rio Tinto Standards 4.1.c and Continuous Improvement Program; Risk Assessment Process; JOSHE Minutes re ventilation redesign for arc-air welding.		3/5 Although there are some positive cases of employee consultation in redesign of work processes, there are still some significant barriers to overcome before it can become effective. These barriers relate to a predominant view that workers' opinions are often ignored because production has priority over safety, and to their lack of trust in the company.	4/5	<ul style="list-style-type: none"> <li>• <b>Discrepancy</b> between documents and focus groups</li> </ul>	
40. H&S hazards are identified and risks are addressed in the design, planning and procurement phases and activities of all new projects.	5/5 Based on Rio Tinto Standard 1.1. Risk Assessment process , e.g., ergonomic cab design.	3.42/5		4.21/5		





## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





41. A. Specific safety procedures are in place for critical safety activities such as equipment lock-out, confined space entry, bypassing safety critical systems, etc.  B. These procedures are consistently followed	5/5 Based on Rio Tinto Standards c1-c6; corporate audit results.	4.04/5		4.55/5		
42.A comprehensive preventive maintenance program is in place and is regularly audited.	Need more docs to show comprehensiveness and regular auditing. Should we reword? Perhaps remove or define "comprehensive" and remove reference to audit, and replace with "and operates effectively"?		2.5/5 Although there are examples of preventive maintenance programs being in place, according to most participants these programs are undermined in practice by employee cutbacks and pressures for increased production. Employees noted long backlogs, the tendency to prioritize production rather than safety-related maintenance, and often cited the government directive on haulage trucks as evidence that the program was flawed.	?	<ul style="list-style-type: none"> <li>• Documentation insufficient</li> <li>• Wording</li> </ul>	
Section 4: Quality of OHSMS						




## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





45. There is a comprehensive change management program in place that integrates H&S considerations in all forms of change, including equipment, plant, work organization, procedural and information systems, and findings are regularly communicated to those potentially affected by the changes.	5/5? This score based on first half of indicator and the Rio Tinto Standards a2, 5.1. Do we need the last part of the indicator about regular communication to those affected?	3.43/5		4.22/5	Wording	
46. Regular reviews of OHMS are planned and implemented, covering all aspects of the safety system.	No documents available even though with quality model it is expected that management reviews are conducted?			?	Documentation	
48. Results of all reviews and implementation processes are communicated to all employees and improvement targets are set.	0/5? Are there any documents to show this?	3.01/5		?	Documentation	
49. Regular audits examine compliance of the H&S system with all internal policies, standards, and procedures as well as all currently applicable laws, regulations, guidelines, and voluntary schemes.	5/5? Score based on Rio Tinto audit, government inspections. Do we need phrase "voluntary schemes" – or clarify it?			?	Wording	




## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





51. There is a process that encourages all employees to behave in a healthy and safe manner and to suggest H&S improvements.	5/5 Score based on safety workshops, safety talks, orientation package, safety interactions, continuous improvement award, and spot awards.		2/5 Despite the evidence of programs and procedures being in place, the engagement of employees is undermined by a perception of a company who always prioritizes production over safety, and is not genuinely interested in employee suggestions for improvement. Incentive schemes are seen largely as encouraging behaviour contradictory to their purpose. Thus, in its implementation, the process required in this indicator does not effectively encourage safe behaviour and employee feedback.	3.5/5	<b>Discrepancy</b> between documents and focus groups	
52. There is a process in place to review the H&S impact of all reward and recognition schemes.	0/5? Impact of reward and recognitions schemes - no documents provided – is there a review process?			?	Documentation	
53. There is an effective system for mentoring new employees or employees changing roles to ensure optimal H&S performance.	4.5/5 Score based on mentoring employees program; orientation package, training programs, mentoring programs, Team Leader development program. Need more documents on employees changing jobs.		2/5 There is a system in place but it does not seem to be effective, based on the focus group input. The overall view was that safety is being threatened by inadequate mentoring of both new hires and flexible workers.	3.25/5	<b>Discrepancy</b> between documents and focus groups	
Section 5: Inclusion of Long-Term Health Issues						


## SafetyNet Project 2B Evaluation Tool Results

 Strength	 Needs Attention
 Discussion Required	 OK Core Indicator

55. A program of exposure monitoring and health surveillance is in place under the supervision of appropriately qualified personnel and based on recognized standards and monitoring methods for the identification and assessment of health hazards in the workplace.	5/5 Exposure monitoring and health surveillance score based on Health and Hygiene Program			5/5	Score based on documentation alone suggests good performance on this indicator, however, it is the only measure recorded for this particular indicator.	
56. Processes are in place to respond to concerns raised by the health surveillance or exposure monitoring program in accordance with the hierarchy of controls. These processes are regularly reviewed for effectiveness.	Response to concerns raised in monitoring and surveillance; Not sure how we assess whether in accordance to hierarchy of control from documents provided. More documents needed on regular review.		1.5/5 Although there appears to be a process whereby the company applies the HOC to concerns raised by health and exposure monitoring, but the information from the employee focus groups indicate it has not been implemented effectively in practice. On the contrary, there is a deep level of anxiety and frustration combined with cynicism over the company's perceived failure in this aspect of hazard management, mostly explained by the employees in terms of company priority of production over safety.	?	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient.</li> <li>Low score from focus groups coupled with uncertain documentation suggests room for improvement.</li> </ul>	
57. Programs are available to help employees deal with issues involving fatigue, addiction, impairment and similar issues.	5/5? Wellness programs; implicit from other documents that IOC has an EAP program but need confirmation.			?	Clarification needed at workshop to confirm that IOC in fact has an EAP program in place.	

## SafetyNet Project 2B Evaluation Tool Results

	Strength		Needs Attention
	Discussion Required		OK Core Indicator

58. Wellness programs are available to all employees.	5/5 Wellness programs.			5/5		
60. There is a process for managing illness cases and for providing support for return to work.	5/5 Score based on Return to Work Program	3.10/5		4.05/5		

Average Scores by Success Factor	Documentary Evidence	Questionnaire	Focus Groups	Overall
1.a. Employer Roles	4.8/5	3.26/5	2/5	3.35/5
1.b. Employee Roles	?	3.81/5	3.63/5	3.72/5
2. Hazard Management	2.5/5	3.53/5	1.5/5	2.51/5
3. Integration	5/5	3.73/5	2.5/5	3.74
4. Quality of OHSMS	4.83/5	3.22/5	2/5	3.35/5
5. Long-Term Health Issues	5/5	3.10/5	1.5/5	3.2/5
<b>Total</b>	<b>4.4/5</b>	<b>3.44/5</b>	<b>2.19/5</b>	<b>3.35</b>

Success Factor Number of Indicators	Documentary Evidence	Questionnaire	Focus Groups
1.a. Employer Roles	10	5	2
1.b. Employee Roles	1	1	4
2. Hazard Management	3	1	1
3. Integration	6	2	3
4. Quality of OHSMS	7	2	2
5. Long-Term Health Issues	5	1	1
<b>Total</b>	<b>32</b>	<b>12</b>	<b>13</b>



## APPENDIX F4

### ANALYSIS OF DOCUMENTARY EVIDENCE FOR PROJECT 2B EVALUATION TOOL

#### Employer Roles

1. management provides adequate supervision
  - 5
    - docs indicate multiple activities incl. Planned General Inspections, Take 5s, Safety Interactions, Safety Tours, Risk Registers, Safety Workshops
  - delete last component—duplicates indicator 3
3. mgt. encourages open communication
  - 5
    - Safety Interactions, Workshops, Safety Meetings
4. coaching
  - 5
  - Safety Interactions; 1-minute Safety Talks; Risk Assessment—Group Discussions; Safety Interactions
5. mgt. provides opportunities for participation
  - 4.5
    - Take 5's; Safety Meetings, Continuous Improvement Programs, Training Programs, Orientation Package
10. quality of training programs evaluated
  - W
    - docs include only employee feedback on satisfaction but nothing else on content, scope and quality
13. OHS implications of shift work considered
  - 1.0? W
    - no documentation other than legislation and hours, nothing on linkage between hours worked and HS
17. informal audits
  - W: bad question? meaning unclear; useful? are there actually any informal audits?
20. managers participate in safety tours, etc.
  - 4.5
    - General Tours plus Safety Interactions, workshops, etc.
22. managers seek feedback
  - W
    - are these workshops repeated? how often?
    - what levels of mgt. participated in the workshops?
    - any other documentation on other attempts to seek feedback?
    - wording: is 'all levels' good wording? realistic?

25. managers participate in investigations and follow-up

- W
  - are there any other docs to show mgt leadership in investigation?
  - what level of mgt is involved?
  - who chairs?
  - are results reported to work force
  - wording
    - should it say 'senior' management?
    - 'report': is this necessary? if so, report to whom?

**Employee Roles**

29. employees work safely, signal hazards, etc. and take action

- W
  - other than those who got Spot awards, are there any docs to show other workers communicating hazards and ideas?
  - Spot Awards: how many per year? how many years has program run?
  - Continuous Improvement Program: where? how comprehensive? how long

**HAZARD MANAGEMENT**

34. hazard identification processes respecting hierarchy of controls in place?

- W
  - documents only are insufficient to assess questions especially about hierarchy of controls and 'appropriateness' to consequences
  - Risk Assessment Powerpoint doesn't contain much on hierarchy of controls

35. participation in hazard ID and risk management

- 2.0
  - docs don't indicate any shopfloor participation

36. timely remediation

- 3
- wording: 'appropriate' not needed because examined in indicator 34
  - General Follow-Up Report Oct. 6 06 for period since June 15 03 indicates a pattern of overall improvement in numbers of items for follow-up and timeliness of remediation
    - 2003 (June-December) had 40 items of which 16 (40%) were fixed later than due date with an average lateness of 122.5 days for the late items and an overall timeliness average of 48.2

- by 2005 there were only 24 items of which 7 were late (29.2%) with an average lateness of 64.4 days and a timeliness average of 17.3 days
- after 2004, very few very long delays
- see tabulations on page 3 of summary
- other interesting implications and hypotheses:
  - no. of items reported by JOSHE tours was high in 2003 but then negligible thereafter (19, 2, 3, 0); i.e., IOC is not identifying problems pro-actively but is waiting till government inspectors do so
  - 2003 was a very bad year after which things settled down; after 2004, almost no very long delays, the longest being 'provide plans for dust collectors' which took 344 days and the next longest delay being 194 days and then 28 days; in 2006, the longest delay is 11 days
- JOSHE Minutes (3 sets provided for April, June and August, 2006)
  - Two major safety issues, such as fixing a conveyor dust problem (first raised in November 1999) and fixing dust emissions at various transfer points in Product Delivery (first raised in January 2001), were still outstanding according to the three sets of 2006 minutes available. The first item took until 2004 to start work on and the second item took until 2005 – an engineering review in both cases- resulting in a long delay of over four years in each case before any remedial action was undertaken.
  - June 2006 minutes noted the start of a larger dust control project
  - Another item raised in January 2004 – inadequate ventilation for arc-air welding – was still outstanding in the August minutes, but it is noted that funds had been budgeted and workers consulted about a proposed design. However, there was no planned completion date noted.
  - Other smaller items raised in 2005 and 2006 were completed by the August minutes, but the it was not clear what the outcome of the Tool Crib Emergency Exit issue was remedied.

### 37. audit results implemented and tracked

- W
- wording problem; does tracking component overlap with 36?; indicator is too complicated and needs to be reduced to focus on implementation of results of reviews and audits

### 38. review of risk registers

- W

- is it necessary to focus on risk registers as compare to hazard identification more broadly as in indicator 34? does 38 overlap with hierarchy of controls component of Indicator 34? should we rather focus on the question of underlying causes?

### **Integration of OHS into general management system**

39. inclusion of worker experience in design, etc.

- 5
  - based on Rio Tinto Standards 4.1.c and Continuous Improvement Program; Risk Assessment Process; JOSHE Minutes re ventilation redesign for arc-air welding

40. hazard identification done for all new projects

- 5
  - based on Rio Tinto Standard 1.1
  - Risk Assessment process , e.g., ergonomic cab design

41. safety procedures for critical safety activities

- 5
  - Rio Tinto Standards c1-c6; corporate audit results

## **APPENDIX F5**

### **The MUN-IOC Health and Safety System Evaluation Tool Assessment of the Survey Instrument**

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This report was written at the request of the research team involved in a pilot study at the Iron Ore Company's (IOC) in Labrador City, NL. The report examines the data generated from a survey in October, 2006 of employees and staff at IOC. Its purpose is to assess the effectiveness of the survey instrument designed by the research team. In particular, we will examine issues related to validity, reliability and practicality.

### **Validity**

Validity is in essence a measure of the instrument's accuracy (i.e., Does the survey measure what we expect it to?). In the present study, we cannot assess statistical validity. This is because we cannot statistically examine the relationship (i.e., correlation) between the survey responses to another measure of health and safety effectiveness (i.e., accident rates). However, we can assess face validity and content validity. Face validity in essence exists if the instrument 'on its face' appears to be valid. Content validity is said to exist when the survey questions are representative of the area (in this case, health and safety system effectiveness) about which we wish to draw conclusions. I am confident that, based on the multiple approaches methodologies used to design the instrument (e.g., literature reviews, qualitative investigations, etc.) the indicators included in the survey demonstrate both forms of theoretical validity.

### **Reliability**

Reliability refers to the consistency of the instrument. Often we use Cronbach's alpha to examine internal consistency of survey measures. Thus Cronbach's alpha was the focus of the reliability analysis. Specifically, we examined the:

- extent to which survey questions reflected the indicator they were designed to measure
- degree to which indicators reflected the success factor that they were designed to measure

The results are presented in Table 1. It is generally accepted that a Cronbach's alpha coefficient of .70 (or higher) indicates that a measure is reliable. Note that all of the indicators but one (Indicator 41) had a Cronbach's alpha above .70. Also note that the reliability coefficient of that one Indicator, number 41 was .69—extremely close to the .70 threshold. Overall, this suggests that the indicators demonstrated an acceptable (and often high) level of reliability.

Our analysis of factor reliabilities was limited to factors for which the survey included more than one indicator. The reliabilities of factors with single indicators has been tested and presented in Table 1. For example, indicator 36 was the only indicator for factor 2; indicator 48 was the only indicator for factor 4, etc. In the present survey, only Factors 1a (indicators 1, 4, 5, 20, 22) and factor 3 (indicators 40, 41, 45) had more than one indicator. The analyses of these success factors showed similar levels of high reliability (see Table 2), with Cronbach's alpha scores well above the .70 level. These combined results demonstrate that the instrument as a whole demonstrated an acceptable (and often high) level of reliability.

## **Practicality**

There is general agreement in the research community that validity and reliability alone are not sufficient -- practicality also represents an important element in effective surveys.

In the following section, we analyze the results to examine the extent to which the instrument can provide key stakeholders with practically useful insights concerning

- Areas of strength
- Area for development
- Areas where staff and union members see things differently.

These specific areas were chosen for several reasons. First, it is important to highlight areas of strength so that organizations are encouraged to maintain their best practices. Second, as is the case with all systems and processes, it is important to understand areas where more focus and development is needed to realize gains. Third, it is important to examine areas where the perspectives of unionized employees and those of staff (most of whom are managers) differ. Given the nature of their roles, employees and staff do not always see things in the same light. The identification of inconsistencies of perspective allows a fruitful dialogue to be undertaken.

### Areas of Strength and Areas for Development

In order to assess areas of strength and areas of development, we needed to have a common reference point for all of the indicators included in the survey. As each survey question (i.e., item) was assessed on a 5-point scale, we took the total score for an indicator, divided by the number of questions assessing that indicator, to generate an



average score per indicator on a 5-point scale. For example, indicator 45 (total score=20.60) had six items for an average score (on a 5-point scale) of 3.43. These results are presented in Table 3.

In Table 3, it would appear that the top two areas of strength in the current system are indicators 41 (Specific safety procedures are in place and followed) and 30 (Employees feel comfortable talking to fellow workers about their work practices) that are at (or near) the 4.0 level. One should note an important issue here for indicator 41, the fact already noted that its reliability was the lowest among the indicators. This was because the mean score for the question concerning ‘procedures in place’ was 4.32 relative to a mean score of 3.77 for ‘procedures being followed.’ This difference suggests that while the stakeholders had great success in creating the procedures, some work still needs to be done with regards to the consistent implementation of these procedures. It further suggests that: (1) future users of the evaluation tool may wish to treat these as two distinct indicators and (2) in some cases, organizations may need to pay attention not only; to average scores but to the individual scores on each of the survey questions.

Turning to the areas for development and focus, the lowest scores (below 3.00) were indicators 22 (Management at all levels seeks feedback from the group on OHS issues) and 48 (Results of all reviews and implementation processes are communicated to all employees and improvement targets set). Overall, this suggests that the stakeholders should focus on these two areas in the future.

### Differences in Perception

T-tests are often used to assess the difference in the average score of one group as compared to that of a second group. We used t-tests to examine the extent to which unionized employees and staff differed in their responses concerning indicators. T-tests revealed that unionized employees' scores for all indicators except indicator 30 (Employees feel comfortable talking to fellow workers about their work practices) were significantly lower than those of staff. Note that these results are presented both for total scores (see Table 4) and for average scores for each indicator (see Table 5).

A closer examination of Table 5 reveals several interesting insights for the key stakeholders. First, there is general consensus that indicator 41 (which had the highest score in Table 3) is also in the top two scores for both unionized employees and staff – suggesting overall agreement on this issue. Similarly, indicators 22 (Management at all levels seeks feedback from the group up on OHS issues) and 48 (Results of all reviews and implementation processes are communicated to all employees and improvement targets set) are among the lowest three scores for both unionized employees and staff in Table 5. These same two indicators were also among the lowest scores in Table 3. Thus these issues appear to be important to all parties.

Second, there are at least four indicators where the gap between the views of unionized employees and those of staff differ by more than 1 point on a 5-point scale. In fact, for two of these indicators (20 and 22) the gap is 1.36 points. While scores on indicator 22 for both unionized employees and staff were low, it is still worth noting the large

difference between the scores of the two groups on this issue. Thus, it would seem prudent for union and management to meet to discuss the potential causes of these differences in perception.

## **Summary and Limitations**

Overall, the survey tool appears to meet the criteria of validity, reliability and practicality.

It appears to be an effective instrument that can be used to assess the effectiveness of health and safety systems. In the future, the parties may wish to track the scores on the various indicators over time in order to track longer-term effectiveness. In addition, the stakeholders may wish to compare the results of indicator scores in this evaluation tool with other measures of health and safety effectiveness (e.g., accident rates, reporting, or lost-time incident rates).

Several limitations, common to many surveys, follow. The first is the relatively low response rate of 194 respondents which may make no-response bias an issue. Non-response bias is a concern because the views of non-respondents may have differed significantly from the views of respondents. Second, common method bias may exist as all indicators were assessed at a single time on a single survey. Third, the sample consisted solely of employees in one organization. Thus, running this same survey with a larger sample, or second group, could be a valuable next step in the process.

**Table 1- Reliabilities of Indicators**

Indicator	Mean	Standard Deviation (sd)	Cronbach's Alpha
1	14.61	4.03	.89
5	18.09	6.94	.96
36	7.07	2.14	.88
40	27.37	7.20	.95
41	8.08	1.79	.69
45	20.60	5.60	.93
48	9.03	3.56	.89

**Table 2- Reliabilities of Factors**

Factor	Mean	Standard Deviation (sd)	Cronbach's Alpha
1a	42.66	13.34	.96
3	56.14	12.50	.95

**Table 3 – Average Score Per Indicator**

Indicator	Mean	Standard Deviation (sd)	Number of Items	Average Score Per Item	Standard Deviation (sd)
1	14.61	4.03	4	3.65	1.00
4	3.47	1.19	1	3.47	1.19
5	18.09	6.93	6	3.02	1.16
20	3.32	1.34	1	3.32	1.34
22	2.85	1.31	1	2.85+	1.31
30	3.81	1.02	1	3.81*	1.02
36	7.07	2.14	2	3.53	1.07
40	27.37	7.20	8	3.42	.90
41	8.08	1.79	2	4.04*	.89
45	20.60	5.60	6	3.43	.93
48	9.03	3.36	3	3.01+	1.19
60	3.10	1.23	1	3.10	1.23

Note: \* = top two areas of strength

+ = top 2 areas for future development

**Table 4 – Union-Staff Comparisons of Total Scores**

Indicator	Union Mean	Staff Means	T-test
1	13.40	17.26	6.51***
4	3.09	4.26	6.76***
5	15.70	22.79	7.19***
20	2.88	4.24	7.25***
22	2.40	3.76	7.34***
30	3.91	3.74	1.11
36	6.53	8.16	5.08***
40	25.33	31.71	6.00***
41	7.76	8.79	3.54***
45	19.18	23.32	4.74***
48	8.06	11.07	6.11***
60	2.84	3.81	5.53***

Note: \*\*\* = significant at  $p < .001$

**Table 5 – Union-Staff Comparisons of Average Scores Using a 5-Point Scale**

Indicator	Union Mean	Staff Means	Gap (Difference in Union and Staff Means)	T-test
1	3.35	4.31	0.96	6.51***
4	3.09	4.26	1.17	6.76***
5	2.62	3.80	1.18	7.19***
20	2.88	4.24	1.36+	7.25***
22	2.40	3.76	1.36+	7.34***
30	3.91	3.74	0.17	1.11
36	3.26	4.08	0.82	5.08***
40	3.17	3.96	0.79	6.00***
41	3.88	4.40	0.52	3.54***
45	3.20	3.89	0.69	4.74***
48	2.69	3.67	0.98	6.11***
60	2.84	3.81	0.97	5.53***

Note: \*\*\* = significant at  $p < .001$

+ area of greatest difference of opinion



## APPENDIX F6

### PILOT STUDY AT IOC OCTOBER 2006: FOCUS GROUP EVIDENCE

Number of focus groups in total = 11

Two each of employees from the concentrator, pellet plant and mine, and one from central services division. One each of middle managers, general managers, and safety specialists. One of the USWA Executive.

E = employee focus groups

M = management

SS = safety specialists

U = USWA Executive

Overall score out of 5

### Employer Roles

3 encourages open communication (E+M+SS+U)

#### Summary

Management participants in general noted that open communications was strongly encouraged in many ways, such as through safety meetings, safety interactions, toolbox meetings, safety tours, JOSH, formal joint meetings (general and safety), Continuous Improvement Schemes, Smart Works, and T5s. And, while recognizing some variation in Team Leaders, most employee participants acknowledged that they could be open about their concerns at the regular safety meetings, on the surface at least. They mentioned few of the other mechanisms listed by management. However, employees identified three general barriers to open communication that, in effect, impeded their ability to be frank about their concerns:

1. Matters raised were not remedied in a timely fashion, or not at all, discouraging future communication.
2. Some concerns raised were not recognized because they were seen by management as not directly linked to production, so that safety-related hazards were less likely to be acted upon, such as high heat or dust levels, further discouraging communication.
3. Discipline as a frequent response to reporting an incident resulted in workers being fearful of reporting an incident, including near-misses.
4. The general emphasis on individual worker behaviour in all safety matters led to a reluctance to speak out. Resentment of the “blame the worker” tendency was a strong theme in the focus groups overall.

Overall assessment: 2

The formal structures and processes appear to be in place but there are organizational barriers preventing them from working effectively in practice to encourage open communication, such as long delays in remedial action, a production imperative and a focus on the individual worker behaviour model of health and safety.

### 13 considers OHS implications of shift-work (E+SS+U)

#### Summary

All employee focus groups saw a problem with the impact of shift-work on H & S. Most participants understood that management's scheduling was largely influenced by production rather than any consideration of OHS. The main issues were:

1. Every group referred to the potential danger in the fatigue-inducing pattern of calling out for night shift a worker whose shift immediately before had been during the day, and then requiring the next day shift straight afterwards. This arrangement means 16 hours' consecutive work and is in strict compliance with the 8 hour rest rule, but in practice workers are usually called out before they have a chance to have any sleep, as they are planning to go to work the next day rather than midnight.
2. Often when there is a large service job maintenance workers used to 8 hour day shifts are asked to do 10 12 hour shifts in a row, often with a change half way through to either days or nights. Safety impacts were associated with fatigue, including the increased likelihood of accidents and near misses and pulled muscles.
3. Overtime is voluntary in theory and money is the key motivator, but the company does the scheduling and if there is a complaint or an incident the response is that the worker should have refused to work (onus on worker). Often there is the threat of giving the work to contractors and employees will likely work harder and longer to prevent this.
4. Previous cutbacks (raised by the union before) and current shortage of the skilled trades make the overtime and shift-work problem worse.

Overall assessment: 2

Management gives insufficient consideration to the health and safety implications of shift-work decisions, relying too much on the voluntary nature (and monetary reward) of overtime to justify long term fatigue-inducing patterns of work. Their overriding reliance on the worker behaviour model of H & S means that in effect all the onus is on the worker.

## **Employee roles**

### 26 awareness of regulations, standards and procedures and personal responsibility (M+SS)

## Summary

1. Knowledge – Employees generally have good knowledge of the fundamental Rio Tinto Standards applicable to their job, but are less likely to know the lower tiers or the detailed OSH regulations, although they usually know their general rights, such as the right to refuse.
2. Compliance – Most workers comply, more so over the last 2 or 3 years because of more rigorous inductions. Only a small percentage does not and often this is not a deliberate breach but a lack of full understanding of the intent of the standards. Sometimes shortcuts are taken if they are a long established work practice and risks are perceived as low.
3. Personal responsibility – Workers’ responsibility for their own safety is more evident now than a few years’ ago, due in part to the introduction of T5s. Full responsibility for the team as well is not so well established. Sometimes a worker will accept responsibility for both self and others at the beginning of task but if there is an incident then worker will shift responsibility to management (incompetence or working conditions).

Overall assessment: 3.75

Employees are largely aware of standards, procedures, and OSH regulations pertaining to their job, they mostly comply with them, and they mostly take responsibility for their own and others’ safety. However, a small percentage does not comply due to varying risk perceptions.

## 28 ability to identify hazards (E+M+SS+U)

## Summary

1. Management participants noted that workers in general are improving in their ability to identify hazards, given company processes to aid identification (see Indicator 3 summary). However, they saw some problems with the ability to identify the root cause of an incident or a residual risk.
2. Employee participants in general believed that workers were largely able to identify hazards. For them hazard control was the more pressing problem, especially as it also affected the likelihood of formal identification of hazards, and included long delays in fixing hazards, a tendency for “quick fixes” and remedial action dictated by production rather than safety.
3. Employee groups identified three organizational barriers working against their ability to formally identify hazards:
  - a) an increasing use of discipline, which deters formal reporting of hazards
  - b) Team Leaders who sometimes “turn a blind eye” to hazards identified by workers, to get a job done as quickly as possible
  - c) a lack of information about some longer term health hazards, such as continued exposure to various combinations of chemicals and dust, raising the question of realistically being able to identify this level of hazard.

Overall assessment: 3.75

Employees in general have the ability to identify hazards. A small minority apparently does not have this ability; this may be due to a risk perception lower than management's. However, the employees' ability to formally identify hazards is impeded by organizational barriers that deter accurate reporting to management. Moreover, some employees cannot identify a hazard because they do not have enough information on various combinations of chemical and dust exposure to clearly decide whether a particular work process is hazardous or not. This latter observation has implications for the employees' right to know and is a matter for employer not employee roles.

#### 29 communication to those with authority and take action when possible (M)

##### Summary

1. The majority of workers do communicate hazards etc. to those with authority, but a small percentage do not.
2. Of those who do, some will work with management to resolve a hazard, but others will not go any further.
3. Factors underlying any lack of reporting include:
  - a) a cultural acceptance of risks now recognized as significant
  - b) long established work practices that have not recognized particular hazards until an accident has occurred
  - c) reluctance of workers to report co-workers
  - d) a general lack of timely remedial action.

Overall assessment: 3.5

The majority of workers do communicate hazards and related OHS concerns, ideas and suggestions to those with authority to take action. Reasons for any lack in reporting to management largely reflect the traditional employee culture, including long established work practices and a reluctance to report co-workers. In addition, there is the deterrent effect of long delays in remedial action.

#### 32 raise concerns about competency (M) [Dropped from tool by workshop consensus]

##### Summary

1. Workers are unlikely to raise concerns about their competence due to a work ethic that reflects pride in always being able to do the job and thus not necessarily recognizing their own fatigue in the case of overtime requests.
2. Monetary gain is also a key factor in the case of overtime.
3. Indicator 13 data included the fear of overtime work going to contractors.
4. Summer students were cited as an example of where they would be particularly unlikely to speak out on feelings of lack of competency due to job insecurity.

Overall assessment: 3

Workers do not on the whole raise concerns about their competence to do a job due to their work ethic, monetary advantage in the case of overtime and job insecurity for students.

## Effective hazard management

### 36 timely remedial action (E+M+SS+U)

#### Summary

1. Middle managers saw remedial action as being mostly timely but dependent on type of hazard, amount of work needed to fix it and how far it is within the supervisor's control to fix it. They also felt that the company should more fully communicate the complexities of the prioritization process to employees.
2. General Managers added in the factor of short or long term hazard - the latter taking longer to fix – and the employees' perception of "timeliness", which was largely dependent on position and level in the organization.
3. The over-riding view in all the employee groups was that remedial action was not timely; on the contrary, any hazard that did not directly affect production was mostly left for a very long time or for good if it was only safety related. Many examples were given by each group of frequently reported items not fixed because they were not prioritized as production-related, an important one of which was the consistently high level of dust, requiring continual use of PPEs, often in cases where they made getting the job done very difficult.

#### Overall assessment: 1.5

Even taking into account the complexities of the prioritization process, based on the employee/union focus groups, remedial action is not taken in a timely fashion once a hazard has been identified if it does not affect production.

### 38 review of risks to ensure application of hierarchy of controls and identification of underlying causes (E+SS)

#### Summary

1. The consistent view across all employee groups except the safety specialists, the company is not thoroughly investigating to the level of underlying causes and instead focusing on worker behaviour as the main cause of incidents. All groups but the safety specialists also felt that engineering out was rare; some participants related how they had been told by supervisors that the new change management rules had made engineered remedies more difficult.
2. On the other hand, the safety specialists pointed to a systematic assessment of remedial action based on the hierarchy of controls for health and other hazards, although it was also observed in the safety specialist group that the short term, quick repair often stays that way rather than being repaired properly.
3. Consistent with the majority view that the hierarchy of controls is not systematically applied, many participants observed that there was too much reliance on PPEs (for long term and long established hazards such as dust, in particular), and that even engineering tasks related to their use (for example, brackets for fall arrest harnesses) were often difficult to get done. There were also some concerns with a lack of or ineffective use of barriers as a control.

Overall assessment: 2

Processes appear to be in place for investigation to the level of underlying causes and for the application of the hierarchy of controls, but most groups observed a strong tendency to identify worker behaviour as the underlying cause and not investigate beyond this level, as well as a predominant reliance on PPEs rather than engineering hazards out.

## **Integration of OHS into general management systems**

### 39 experience of employees considered in design and engineering (E+SS+U)

#### Summary

1. Some positive examples of where employees were involved in redesign were described, such as the building of new catwalks in the plant, ergonomics of the mine pockets and the building of lift platforms to maintain haulage trucks.
2. However, a fairly consistent view across the groups was that consultation with workers was less now than previously and if they were asked for their feedback, they were often not listened to. Examples provided of input not acted upon included a big crane lift and the trucks purchased by the company.
3. An explanation for reduced employee consultation and not often taking account of employee opinions was thought to be related to the company's priority of production over safety. Also, participants pointed out that the current lack of trust in the company mean workers will be less likely to be frank about their input.

Overall assessment: 3

Although there are some positive cases of employee consultation in redesign of work processes, there are still some significant barriers to overcome before it can become effective. These barriers relate to a predominant view that workers' opinions are often ignored because production has priority over safety, and to their lack of trust in the company.

### 42 preventive maintenance program (E+SS+U)

#### Summary

1. Examples of preventive maintenance referred to included inspections, services, checking calibrations and settings of machines, once a week service days with checklists, regular maintenance shutdowns (for example, for 94 hours), and, recently, ensuring dust collectors were rebuilt along with some connected machines in plant.
2. However, most groups saw a gap between the programs and practice due to employee cutbacks and pressures for (increased) production. Long backlogs were noted and the tendency to service first production-related rather than safety-related machines and equipment (such as ventilation fans).
3. The government directive on haulage trucks was seen by many participants as evidence that preventive maintenance was not being carried out.

Overall assessment: 2.5

Although there are examples of preventive maintenance programs being in place, according to most participants these programs are undermined in practice by employee cutbacks and pressures for increased production. Employees noted long backlogs, the tendency to prioritize production rather than safety-related maintenance, and often cited the government directive on haulage trucks as evidence that the program was flawed.

## Quality of OHSMS

### 51 process to encourage safe and healthy behaviour (E +M+SS+U)

#### Summary

1. Based on management focus groups, and some others, there is clear evidence of a formal process to encourage H & S behaviour and to suggest H & S improvements, including a number of department level joint union-management committees, in addition to JOSH. For a full list of processes encouraging employees' healthy and safe behaviour and their suggestions for improvement, cross reference with Indicator 3.
2. However, from the perspective of the other groups, working against this process is the company tendency of discipline or of ignoring suggestions for improvements (consistent with evidence for Indicator 39), the tendency to blame workers' unsafe behaviour without working through to possible underlying causes of workplace conditions (consistent with evidence for Indicators 38 and 56), the use of T5s to buttress this predominant model of unsafe worker behaviour, the continuing pressure for faster production, and poor employee feedback from some suggestion schemes in place.
3. With regard to specific incentive schemes, most employee groups believed they had a negative impact on co-worker relations. They emphasized that much more powerful than any company promotion or message was the incentive of being able to go home in one piece and being healthy enough to enjoy retirement at the end of their working life. Moreover, the need to keep LTIs down because of both worker and middle management safety incentive schemes ultimately led to an underreporting of hazards, resulting in an apparently good safety record unreflective of reality.

Overall assessment: 2

Despite the evidence of programs and procedures being in place, the engagement of employees is undermined by a perception of a company who always prioritizes production over safety, and is not genuinely interested in employee suggestions for improvement. Incentive schemes are seen largely as encouraging behaviour contradictory to their purpose. Thus, in its implementation, the process required in this indicator does not effectively encourage safe behaviour and employee feedback.

### 53 mentoring new employees and those changing jobs (E+SS+U)

### Summary

1. A competency-based system for new hires and flexible workers requires the training department to sign off after the training and mentoring period.
2. However, the mentoring periods in the plant and the mine were noted as being too short for both new hires and flexible workers, leading to insufficient familiarity with a new work area, including an associated reluctance to speak up about concerns.
3. Many participants pointed to the example of summer students on haulage trucks, whose training and mentoring period had recently dropped from 5 to 2 weeks (check actual length), which was too short for safety and it did not include night driving. This inadequate mentoring had led to a dangerous situation with a young female student who had no previous experience driving at night and went downhill the wrong way, severely frightening her and posing a danger to others.
4. Inappropriate work allocation added to the problems of inadequate mentoring of flexible workers, so that both quality and safety were jeopardized.

### Overall assessment: 2

There is a system in place but it does not seem to be effective, based on the focus group input. The overall view was that safety is being threatened by inadequate mentoring of both new hires and flexible workers.

## Inclusion of long-term health issues

### 56 response to exposure monitoring and health surveillance (E+M+SS+U)

### Summary

1. General Managers noted the response to health monitoring programs was always based on the hierarchy of controls (HOC), as the possibility of engineering out is considered first before moving to other levels.
2. Middle managers also noted this commitment but also observed the difficulty of deciding what level of the hierarchy is appropriate for the given situation; sometimes it is very difficult to completely understand the underlying causes of an incident and respond to them accordingly. Investigators have to fully understand the concept of HOC and recent company training has focused on a “root cause” tool. On a positive note, they saw some pockets of excellence on site.
3. In general, the employee groups viewed the company as not effectively applying the HOC in response to health and exposure monitoring (they specifically mentioned dust, chemical and noise monitoring). Some of the problems identified follow:
  - a) There was too much reliance on PPEs, even when workers complained about higher than usual levels of dust or chemical vapour.
  - b) Potential long term health effects were not made clear to workers when a concern was raised, such as a newer mixture of substances in PP production, so they had to question the appropriate application of HOC



when no attempt was apparently being made to find out the cumulative effect of such changes.

- c) They felt that very little was being done by the company about any cases of impaired hearing and respiratory disease discovered from health surveillance programs.
- d) Some workers felt that they were not being told the full extent of occupational disease, such as the numbers of deaths from silicosis in ex-workers. On the contrary, the company's position was always to deny that any symptoms or diagnosed disease was work related but instead argue for lifestyle causality and to then fight against an employee's right to WHSCC benefits.
- e) Noting a 30 year long threat to health posed by high dust levels from the IOC load out and its effect on the town and their families, the perception was that the company had done nothing to remedy it.

Overall assessment: 1.5

Although there appears to be a process whereby the company applies the HOC to concerns raised by health and exposure monitoring, but the information from the employee focus groups indicate it has not been implemented effectively in practice. On the contrary, there is a deep level of anxiety and frustration combined with cynicism over the company's perceived failure in this aspect of hazard management, mostly explained by the employees in terms of company priority of production over safety.

## APPENDIX G1

### **CLOSING WORKSHOP AT I.O.C. DECEMBER 12-13 2007 LABRADOR CITY (Carol Inn, Conference Room #3) PROPOSED AGENDA**

#### **Wednesday, December 12**

*Working Dinner and Session 7:30-10:00*

1. Background on the objectives, design and procedures of this project (8:00-8:15)
2. Draft results of the IOC pilot study (8:15-8:45)
3. Refining the IOC results (8:45-10:00)

#### **Thursday, December 13**

*Breakfast 8:00-8:30*

3. Refining the IOC results, continued (8:30-10:30)

*Break (10:30-10:45)*

4. What will the resulting evaluation tool look like? (10:45-11:15)
5. Assessing our collaboration (11:15-12:15)
  - a. the tool
    - i. what will it tell us that we didn't already know?
    - ii. how could it be improved for IOC and in general?
  - b. the process
    - i. What has it taught us? what can it teach us in the future?
    - ii. What were its strengths and weaknesses?
    - iii. How could it be improved?

*Lunch (12:15-1:00)*

6. Next steps at IOC? (1:00-2:00)
  - a. Any implications for short-term action?
  - b. Which 'rotating indicators' to add?
  - c. Timing of next survey
  - d. Logistics and use
7. Moving beyond Labrador City? (2:00-2:30)
  - a. Can it be exported to other IOC sites? What would be involved?
  - b. To other companies and industries? Which ones? What would be involved?
8. Summing up (2:30-3:00)

## APPENDIX G2



**EVALUATING HSM SYSTEMS  
IOC PILOT PROJECT  
*FINAL WORKSHOP***

Labrador City  
December 12-13, 2007

## BACKGROUND



- SafetyNet funded study
- The aim: to develop and pilot-test at IOC a consultative process through which the company's workers and managers can work with SafetyNet and other researchers to produce an innovative evaluation tool for potential application at IOC and other workplaces.
- The steering group consists of senior representatives of management and union, the JOSH Committees and the SafetyNet research team

## IMPORTANCE OF PROJECT *SafetyNet*

- International research highlights some important gaps in OHSMS design and implementation
- Also, that conventional “off the shelf” audits often miss these gaps
- Continuous improvement - even the best OHSMS needs to be evaluated on a regular basis

## FROM GAPS TO SUCCESS FACTORS



- Senior management commitment
- Comprehensive worker participation
- Proactive hazard identification and control
- Integration of management systems and building in organizational factors
- Targeting long term factors (such as health)
- Broad-based auditing

*(e.g., Frick et al. 2000; Gallagher et al. 2001; Hopkins 2000)*

# RESEARCH DESIGN

*SafetyNet*

- 2004-2005: Literature review, identification of OHSMS success factors, design of study and negotiation of Memorandum of Understanding
- June 2005: Initial consultation with IOC employees through interviews and focus groups to discover their view of what is important in safety management
  - Interviews: broad difference regarding focus on individual factors or working conditions



- June 2005:
  - Focus groups: overall focus on working conditions
    - *Housekeeping, safety procedures, team effort, timely remedial action, effective training for everybody, time to work safely, senior management commitment, input from the shop floor and identification of root causes*
    - *Need for improvement: timely remedial action, more receptive and open communication with middle management and recognition of the impact of more production with fewer employees*

## RESEARCH DESIGN



- February 2006: First workshop to reach consensus on success factors to include in evaluation tool and to design associated performance indicators, based on all input at that stage but especially on workplace data
  - 6 success factors were categorized as employer roles, employee roles, hazard management, integration, quality of OHSMS, long-term health issues
  - 36 “core” indicators were selected (those that are included every time the evaluation tool is used) together with 27 “rotating” indicators (those that are optional and sequential)
  - Some performance measures of core indicators were discussed

## RESEARCH DESIGN



- March to September 2006: Development of evaluation tool by research team in consultation with IOC partners (working group) through teleconferences and one all-day meeting in St. John's
- October 2006: Pilot study conducted by research team at IOC, consisting of documentary analysis, employee questionnaire and focus groups
- November 2006 to April 2007: Analysis and write-up of the pilot study by the research team

## RESEARCH DESIGN



- December 2007: Final workshop to review, assess and refine the piloted evaluation tool, and to consider its potential use at other workplaces
- January/February 2008 Onwards: Feedback and dissemination

### CORE INDICATORS

- Total number = 36
- Distribution by Success Factors
  - #1a Employer Roles = 10
  - #1b Employee Roles = 5
  - #2 Hazard Management = 4
  - #3 Integration of OHS = 5
  - #4 OHSMS Quality = 7
  - #5 Inclusion of Health Issues = 5

## SCORING THE INDICATORS *SafetyNet*

- INPUTS USED
  - Documents
  - Questionnaire
  - Focus Groups
- SCORING METHOD USED
  - For questionnaire
  - For other inputs
  - Overall scores

## WHAT THE SCORES MEAN *SafetyNet*

- OVERALL SCORE OF 4.0 OR MORE
  - Colour code: green
  - Meaning: strong performance
  - Action suggested: continue to monitor, keep up the good work; retain for IOC and elsewhere
  - Number of indicators = 7

## WHAT THE SCORES MEAN



### SCORE OF 2.5 OR LESS

- Colour code **red**
- Meaning: problem performance
- Action suggested: attention required at IOC; probably important for use elsewhere
- Number of indicators = 3



## WHAT THE SCORES MEAN *SafetyNet*

### SCORE OF 2.6 to 3.9

- Colour code white
- Meaning: useful indicator, nothing unusual, continue using at IOC and elsewhere
- Action suggested: continue monitoring
- Number of indicators = 6

## WHAT THE SCORES MEAN

SafetyNet

???????

- Colour code **yellow**
- Meaning: something's funny
  - 1. wording issues
  - 2. overlap with another indicator
  - 3. insufficient evidence
  - 4. discrepancy between inputs or groups
- Action suggested: discuss at workshop; decide on utilization
- Number of indicators = 20

## 'ROTATING' INDICATORS



- Meaning?
- Number = 27
- Distribution by Success Factor
  - 1a Employer Role = 15
  - 1b Employee Role = 3
  - 2 Hazard Management = 0
  - 3 Integration of OHS = 2
  - 4 OHSMS Quality = 2
  - 5 Inclusion of Health Issues = 4

## WORKSHOP TASKS

*SafetyNet*

- Discuss the indicators (for IOC? For wider use?)
  - Green indicators: verify
  - Red indicators: verify
  - Yellow indicators: discuss, fix if possible, reclassify, replace
  - Rotators: what use? When? Where?
- Assess our IOC pilot
- Assess our evaluation tool and methods

SafetyNet / IOC Project: Final Evaluation Tool (19 January 2008)





Strength	Needs Attention
Discussion Required	OK Core Indicator



Type of Indicator	Meaning	Number of Indicators in category
Strength	Scores on all sources of evidence used (documents / questionnaire / focus groups) averaged 4.0 or more out of 5.0	11
Needs Attention	Scores on all sources of evidence used averaged less than 2.5	5
OK Core Indicator	Indicator score averages between 2.6 and 3.9	5
Further discussion at workplace required	Insufficient documentation; or strong discrepancy between scores from different sources;	13

All scores are out of a maximum of 5; overall scores are rounded to one decimal place.

Indicator	Documentary Evidence	Questionnaire	Focus Groups E = employees M = managers SS = safety specialists U = USWA executive	Overall	Interpretation/Comments
Success Factor 1a: Employer Roles					
1. Management provides adequate supervision of work; of work practices; and of the application and use of H&S measures. This includes encouraging operational personnel to identify and report hazards.	5 Documents indicate multiple activities including planned general inspections, "take 5s", safety interactions, safety tours, risk registers, and safety workshops.	3.65		4.3	

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	Strength		Needs Attention
	Discussion Required		OK Core Indicator





3. Management encourages open communication processes for raising occupational health and safety issues.	5 Safety interactions, workshops, and safety meetings.		2 E + M + SS + U The formal structures and processes appear to be in place but organizational barriers prevent them from working effectively in practice to encourage open communication. These include long delays in remedial action, a production imperative and a focus on the individual worker behaviour model of health and safety.	3.5	<b>Discrepancy</b> between the evidence found in documentation and that of the focus groups.	
4. Managers and supervisors coach their teams to work safely.	5 Safety Interactions; 1-minute Safety Talks; Risk Assessment—Group Discussions; Safety Interactions	3.47		4.2		
5. Management provides employees with the mechanisms, time and resources necessary to participate effectively in key H&S processes (training, planning, implementation, evaluation, corrective and preventive action).	4.5 Take 5's; Safety Meetings, Continuous Improvement Programs, Training Programs, Orientation Package	3.02		3.8	<i>separate out into 6 components in final report</i>	


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Strength	Needs Attention
Discussion Required	OK Core Indicator





10. Mechanisms, including <b>but not limited to</b> , feed-back from employees, are in place to ensure that the scope, content and quality of the training programs are adequate.	2 Documents include only employee feedback on satisfaction but nothing else on content, scope and quality.			2	Documentation insufficient to support rating for this indicator. <b>No systematic external evaluation of training</b>	
13. Management considers H&S implications of decisions about shift patterns and overtime, including the type of work and worker involved.	1 No documentation other than legislation and hours, nothing on linkage between hours worked and HS.		2 E + SS + U Management gives insufficient consideration to the health and safety implications of shift-work decisions, relying too much on the voluntary nature (and monetary reward) of overtime to justify long term fatigue-inducing patterns of work. Their overriding reliance on the worker behaviour model of H & S means that in effect all the onus is on the worker.	1.5	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator</li> <li><b>Discrepancy</b> between the evidence found in documentation and that of the focus groups suggests a gap between what's on paper and actual practice.</li> </ul>	
20. Managers participate in safety tours, <b>safety interactions</b> and other visible H&S activities.	4.5 General Tours plus Safety Interactions, workshops, etc.	3.32		3.9		

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	Strength		Needs Attention
	Discussion Required		OK Core Indicator

22. Management at all levels seeks feedback from the ground up on OHS issues including through participation in Safety Tours.	3 Are these workshops repeated? How often? What levels of mgt. participated in the workshops? Any other documentation on other attempts to seek feedback? Wording: is 'all levels' good wording? Realistic?	2.85		2.9		
25. Managers at all levels take part in follow-up of incidents, chair incident investigations, and report the findings.	4			4		
<b>Success Factor 1b: Employee Roles</b>						
26. Employees are aware of relevant OSH regulations and company standards and procedures pertinent to their jobs, comply with these, and accept a personal responsibility to protect themselves and others.			3.75 M + SS Employees are largely aware of standards, procedures, and OSH regulations pertaining to their job, they mostly comply with them, and they mostly take responsibility for their own and others' safety. However, a small percentage does not comply due to varying risk perceptions.	3.8		



	Strength		Needs Attention
	Discussion Required		OK Core Indicator

28. Employees are able to identify hazards in the workplace.			3.75 E + M + SS + U Employees have the ability to identify hazards. A small minority apparently does not have this ability; this may be due to a risk perception lower than management's. However, the employees' ability to formally identify hazards is impeded by organizational barriers that deter accurate reporting to management. Moreover, some employees cannot identify a hazard because they do not have enough information on various combinations of chemical and dust exposure to clearly decide whether a particular work process is hazardous or not. This latter observation has implications for the employees' right to know and is a matter for employer not employee roles.	3.8	
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Strength	Needs Attention
Discussion Required	OK Core Indicator

29. Employees communicate hazards and related H&S concerns, ideas and suggestions to those with authority to take action, and take action personally when it is within their sphere of control.	3 Other than those who got Spot awards, are there any docs to show other workers communicating hazards and ideas? Spot Awards: how many per year? How many years has program run? Continuous Improvement Program: where? How comprehensive? How long?		3.5 M The majority of workers do communicate hazards and related OHS concerns, ideas and suggestions to those with authority to take action. Reasons for any lack in reporting to management largely reflect the traditional employee culture, including long established work practices and a reluctance to report co-workers. In addition, there is the deterrent effect of long delays in remedial action.	3.3	<ul style="list-style-type: none"><li>• <b>Documentation</b> insufficient to support rating for this indicator</li></ul>	
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Strength	Needs Attention
Discussion Required	OK Core Indicator





30. Employees feel comfortable talking to fellow workers about their work practices.		3.81		3.8		
<b>Success Factor 2: Hazard Management</b>						
34. Hazard identification and risk management processes based on the hierarchy of controls are in place and they are appropriate to the potential consequences of each hazard.	3 Documents only are insufficient to assess questions especially about hierarchy of controls and 'appropriateness' to consequences. Risk Assessment Power Point doesn't contain much on hierarchy of controls			3	Documents do exist but need to be assembled. Focus group also needed to assess implementation and effectiveness	
35. Hazard identification and risk management processes involve both technical personnel and the employees exposed to the	2 Documents don't indicate any shop floor participation.			2		
36. Appropriate remedial action is taken, <b>reported and documented</b> in a timely fashion when hazards have been identified.	3 * Wording: 'appropriate' not needed because examined in indicator 34	3.53	1.5 E + M + SS + U Even taking into account the complexities of the prioritization process, based on the employee/union focus groups, remedial action is not taken in a timely fashion once a hazard has been identified if it does not affect production.	2.7	<ul style="list-style-type: none"> <li><b>Documentation</b> insufficient to support rating for this indicator.</li> <li><b>Discrepancy:</b> Focus group input points to a potential weakness of remedial action for hazards.</li> </ul>	


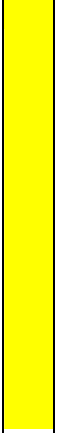
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Strength	Needs Attention
Discussion Required	OK Core Indicator





38. Processes are in place for regular review of risk data base to ensure that the underlying causes have been identified and the hierarchy of controls has been effectively applied.	4		2 E + SS Processes appear to be in place for investigation to the level of underlying causes and for the application of the hierarchy of controls, but most groups observed a strong tendency to identify worker behaviour as the underlying cause and not investigate beyond this level, as well as a predominant reliance on PPEs rather than engineering hazards out.	3	Discrepancy between policy and implementation/effectiveness	
Success Factor 3: Integration of OHS into General Management System						
39. Experience of employees is taken into consideration in the design and engineering of work processes and products to ensure H&S.	5 Based on Rio Tinto Standards 4.1.c and Continuous Improvement Program; Risk Assessment Process; JOSHE Minutes re ventilation redesign for arc-air welding.		3 E Although there are some positive cases of employee consultation in redesign of work processes, there are still some significant barriers to overcome before it can become effective. These barriers relate to a predominant view that workers' opinions are often ignored because production has priority over safety, and to their lack of trust in the company.	4	Discrepancy between documents and focus groups	
40. H&S hazards are identified and risks are addressed in the design, planning and procurement phases and activities of all new projects.	5 Based on Rio Tinto Standard 1.1. Risk Assessment process, e.g., ergonomic cab design.	3.42		4.2		




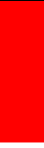

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	Strength		Needs Attention
	Discussion Required		OK Core Indicator





41. A. Specific safety procedures are in place for critical safety activities such as equipment lock-out, confined space entry, bypassing safety critical systems, etc.  B. These procedures are consistently followed	5 Based on Rio Tinto Standards c1-c6; corporate audit results.	4.04		4.6		
42. A comprehensive preventive maintenance program is in place and is regularly audited.	2.5 Need more docs to show comprehensiveness and regular auditing.		2.5 E + SS + U Although there are examples of preventive maintenance programs being in place, according to most participants these programs are undermined in practice by employee cutbacks and pressures for increased production. Employees noted long backlogs, the tendency to prioritize production rather than safety-related maintenance, and often cited the government directive on haulage trucks as evidence that the program was flawed.	2.5	Documentation insufficient	




**SafetyNet / IOC Project: Final Evaluation Tool (19 January 2008)**

	Strength		Needs Attention
	Discussion Required		OK Core Indicator





Success Factor 4: Quality of OHSMS						
17. Informal audits of site activities are conducted by OHS specialists.	4 Documentation not found but workshop discussion confirms regular informal auditing via informal interactions and weekly safety tours.			4		
45. There is a comprehensive change management program in place that integrates H&S considerations in all forms of change, including equipment, plant, work organization, procedural and information systems, and findings are regularly communicated to those potentially affected by the changes.	5 This score based on first half of indicator and the Rio Tinto Standards a2, 5.1. Do we need the last part of the indicator about regular communication to those affected?	3.43		4.2		
46. Regular reviews of OHMS are planned and implemented, covering all aspects of the safety system.	3.5 Documentation available to indicate that ISO review was done in 2005 but skipped in 2006			3.5	ISO review process	
48. Results of all reviews and implementation processes are communicated to all employees and improvement targets are set.	0 No documents to show this	3		1.5	Documentation missing.	
49. Regular audits examine compliance of the H&S system with all internal policies, standards, and procedures as well as all currently applicable laws, regulations, and guidelines.	5 Score based on Rio Tinto audit, government inspections.			5		




SafetyNet / IOC Project: Final Evaluation Tool (19 January 2008)

	Strength		Needs Attention
	Discussion Required		OK Core Indicator

51. There is a process that encourages all employees to behave in a healthy and safe manner and to suggest H&S improvements.	5 Score based on safety workshops, safety talks, orientation package, safety interactions, continuous improvement award, and spot awards.		2 E + M + SS + U Despite the evidence of programs and procedures being in place, the engagement of employees is undermined by a perception of a company who always prioritizes production over safety, and is not genuinely interested in employee suggestions for improvement. Incentive schemes are seen largely as encouraging behaviour contradictory to their purpose. Thus, in its implementation, the process required in this indicator does not effectively encourage safe behaviour and employee feedback.	3.5	<b>Discrepancy</b> between documents and focus groups	
52. There is a process in place to review the H&S impact of all reward and recognition schemes.	1 Impact of reward and recognitions schemes - no documents provided – is there a review process?			1	Documentation missing	
53. There is an effective system for mentoring new employees or employees changing roles to ensure optimal H&S performance	4.5 Score based on mentoring employees program; orientation package, training programs, mentoring programs, Team Leader development program. Need more documents on employees changing jobs.		2 E + SS + U There is a system in place but it does not seem to be effective, based on the focus group input. The overall view was that safety is being threatened by inadequate mentoring of both new hires and flexible workers.	3.3	<b>Discrepancy</b> between documents and focus groups (indicates discrepancy between policy and implementation/effectiveness)	





SafetyNet / IOC Project: Final Evaluation Tool (19 January 2008)

	Strength		Needs Attention
	Discussion Required		OK Core Indicator

Success Factor 5: Inclusion of Long-Term Health Issues						
55. A program of exposure monitoring and health surveillance is in place under the supervision of appropriately qualified personnel and based on recognized standards and monitoring methods for the identification and assessment of health hazards in the workplace.	5 Exposure monitoring and health surveillance score based on Health and Hygiene Program			5	Score based on documentation alone suggests good performance on this indicator, however, it is the only measure recorded for this particular indicator.	
56. Processes are in place to respond to concerns raised by the health surveillance or exposure monitoring program in accordance with the hierarchy of controls. These processes are regularly reviewed for effectiveness.	2 More documents needed on regular review.		1.5 E + M + SS + U Although there appears to be a process whereby the company applies the HOC to concerns raised by health and exposure monitoring, the information from the employee focus groups indicates it has not been implemented effectively in practice. On the contrary, there is a deep level of anxiety and frustration combined with cynicism over the company's perceived failure in this aspect of hazard management, mostly explained by the employees in terms of company priority of production over safety.	1.8	<ul style="list-style-type: none"> <li>• <b>Documentation</b> insufficient.</li> <li>• Low score from focus groups coupled with uncertain documentation suggests room for improvement.</li> </ul>	
57. Programs are available to help employees deal with issues involving fatigue, addiction, impairment and similar issues.	5 Wellness programs; implicit from other documents that IOC has an EAP program			5		



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	Strength		Needs Attention
	Discussion Required		OK Core Indicator

58. Wellness programs are available to all employees.	5 Wellness programs.			5	Implementation needs to be checked; additional measure may be required. Focus group would have helped.	
60. There is a process for managing illness cases and for providing support for return to work.	5 Score based on Return to Work Program only.	3.10		4.05	Focus group would have helped clarify extent of problems.	

**Average Scores by Succss Factor**

Success Factor	Documentary Evidence	Questionnaire	Focus Groups	Average Score
1.a. Employer Roles	3.77	3.26	2	3.01
1.b. Employee Roles	3	3.81	3.67	3.49
2. Hazard Management	3	3.67	1.75	2.81
3. Integration	4.38	3.73	2.75	3.62
4. Quality of OHSMS	3.5	3.22	2	2.91
5. Long-Term Health Issues	4.44	3.10	1.5	3.01
<b>Total</b>	<b>3.68</b>	<b>3.47</b>	<b>2.28</b>	<b>3.14</b>

Strength	Needs Attention
Discussion Required	OK Core Indicator

Indicators and Outcomes by Success Factor

Success Factor	Number of Indicators	Which Indicators?	Red Indicators	Green Indicators	Yellow Indicators	White Indicators
1.a. Employer Roles	9	1, 3, 4, 5, 10, 13, 20, 22, 25	2	3	1	3
1.b. Employee Roles	4	26, 28, 29,30	0	1	1	2
2. Hazard Management	4	34, 35, 36, 38	0	0	4	0
3. Integration	4	39,40, 41, 42	0	2	2	0
4. Quality of OHSMS	8	17, 45, 46, 48, 49, 51, 52, 53	2	3	3	0
5. Long-Term Health Issues	5	55, 56, 57, 58, 60	1	2	2	0
Total	34		5	11	13	5

## APPENDIX G4

### **SafetyNet/IOC Research Project: Closing Workshop**

December 12-13 2007, Labrador City  
Record of Decisions and Action Items  
21 January 2008

The item numbers refer to the Agenda for the workshop that is included in this package as a separate document.

<b>Item #</b>	<b>Topic</b>	<b>Outcome</b>
<b>1 and 2</b>	Reports on project's background and procedures; the draft results of the IOC pilot project	The presentations made by Sue Hart and Stephen Bornstein are attached.
<b>3</b>	Refining the IOC results	The Table of Results for all the indicators examined in the pilot project is attached (dated 19 January 2008). It has now been modified to incorporate all the suggestions made at the Workshop, including changes in the colour coding of several indicators. Passages containing revised wording are in red letters to make them easier to find.
<b>4</b>	The resulting evaluation tool	See notes on items 3, 5 and 7.
<b>5</b>	Assessing our collaborative work	Phil Turner's e-mailed comments on Item 5 are attached. They formed the basis of part of the discussion. There was general agreement that the tool was useful in identifying some areas that union and management can further discuss and address. The process was seen as positive overall. For the USWA, it contributed to their strategic objective of engaging with management about safety, called attention to inconsistencies in perception that could be addressed and resolved jointly, and contributed towards benchmarking. For management, the tool held potential for dovetailing with the regular Rio Tinto audit system. There was a consensus that the main areas for improvement were:

		<ul style="list-style-type: none"> <li>• a larger number of responses to the questionnaire</li> <li>• refinement of the scoring system to put less emphasis on averaging out individual components since this could mask important findings on some composite indicators and to de-emphasize the averaging out of the overall scores for each success factor since this was seen as limiting the usefulness of the feedback.</li> </ul>
<b>6</b>	<b>Next Steps at IOC</b>	<p>Short-term action at IOC should focus on the indicators coded yellow or red (see the revised results table for the final assignment of colours). Union and management will attempt to address or resolve the concerns revealed. Also, it was agreed that it was important to communicate to the employees any concrete action taken as a result of the study. In the meantime, a newsletter article (currently being drafted) will report on the current status of the project. In the longer term, the selection of rotating indicators to be included in the next evaluation phase would be decided jointly by union and management. The establishment of a Steering Committee with union and management representation was suggested as a way forward. The timing of the next use of the evaluation tool was provisionally set as three years after the date of the final report. With regard to knowledge transfer, the academic research team agreed to work on drafting a paper for publication.</p>
<b>7</b>	<b>Moving Beyond Labrador City</b>	<p>Participants agreed that the pilot evaluation tool could be useful elsewhere, although only in large, single employer industrial sites since smaller workplaces tend not to have an occupational health and safety system. Some possibilities suggested for future consideration included use in the</p>

		<p>construction industry and at other USWA-organized sites, such as Sept-Iles, Wabush or a potash plant in Saskatchewan. The Industrial Accident Prevention Association (IAPA) was also mentioned, as was the Come by Chance refinery.</p>
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