MINE OCCUPATIONAL SAFETY AND HEALTH (MOSH) LEADING PRACTICE ADOPTION SYSTEM

EVALUATION REPORT

Prepared for the Chamber of Mines

Draft Report, 4 October 2011

Submitted by:

Centre for Sustainability in Mining and Industry (CSMI)

Physical address:

Third Floor
Chamber of Mines Building
West Campus
University of the Witwatersrand

Postal address:

Private Bag 3
Wits
2050

Contact:

Prof May Hermanus
CSMI Director
Email: may.hermanus@wits.ac.za
Tel: +27 11 717 7422

Nancy Coulson
CSMI Programme Director
Email:nancy.coulson@wits.ac.za
Tel: +27 11 717 7450

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

PART 1

EXECUTIVE SUMMARY

To be completed following feedback from the Chamber of Mines, and completion of the case studies.

1 INTRODUCTION

The Mine Occupational Safety and Health (MOSH) Leading Practice Adoption System was first proposed in 2007. The system is designed to encourage mining companies to adopt leading practices from their peers and others, not least in order to assist the industry to achieve the 2013 safety and health milestones. The adoption of leading practices should also move the sector towards realising the vision of zero harm. The leading practice adoption system was piloted in 2008, and since 2009 has been promoted, managed and delivered to mining companies by the Learning Hub. The Learning Hub is located at the Chamber of Mines.

The MOSH Leading Practice Adoption System comprises four key steps:

- Identifying and selecting a leading practice;

- Documenting the leading practice at the source mine;

- Demonstrating the leading practice at another operation, called the demonstration mine; and

- Facilitating widespread adoption through communities of practice for adoption (COPAs) at source and other mines.

The adoption system explicitly recognises the importance of 'people issues' in adopting new technologies and new ways of doing things.

The Centre for Sustainability in Mining and Industry (CSMI) was contracted to evaluate the progress and effectiveness of the MOSH Leading Practice Adoption System roll out to date, in terms of three primary factors; process, performance and capacity. These factors were further sub-divided into specific elements to identify those that enhance or limit adoption. The evaluation was undertaken with cognisance of the statistic that over 70% of change management processes fail [1].

This report includes a synthesis and analysis of the evaluation findings.

Part One consists of the Executive Summary, this Introduction and the study Methodology.

Part Two reveals the results of the three primary levels of investigation agreed to: governance and oversight, resourcing and capacity and operational issues. Within each section, specific feedback is provided from interviews and site visits (in italics), providing insight into successful aspects of the project as well as challenges. Conclusions and recommendations specific to each of these areas are provided.

Part Three then provides a summary of conclusions and recommendations that affect the development of an appropriate monitoring and evaluation (M&E) framework for the MOSH Leading Practice Adoption System. These wider conclusions are further informed by the analysis of available documentation.

Please note that there is lack of clarity over whether the MOSH Coordinating Committee and the MOSH Steering Committee is the same structure. Unless the latter is referred to verbatim by an interviewee, the term "Coordinating Committee" is used throughout the document, until clarity can be obtained.

---

[1] For more information see Ijaz, S., & Vitalis, A. (2011). Resistance to Organizational Change: Putting the Jigsaw Together. *International Review of Business Research Papers , 7* (3), 112 - 121.

2   METHODOLOGY

This study, conducted over a period of two months (August-September 2011), sought to evaluate the MOSH leading practice adoption process – a process designed to improve health and safety outcomes across the mining industry through the adoption of leading practice. This process evaluation followed and assessed the progression from (i) deciding on a leading practice, (ii) developing the tools and systems necessary for adoption of a leading practice, and (iii) the implementation and uptake of the leading practice at mine sites.

"Evaluation involves assessing the strengths and weaknesses of programs, policies, personnel, products, and organizations to improve their effectiveness" [2]. Evaluation can further be defined as "the systematic application of social research procedures for assessing the conceptualization, design, implementation, and utility of ... programs." [3]

The evaluation study thus used a qualitative research focus with the aim of understanding the successes and challenges of the MOSH process across the mining industry. The MOSH evaluation engaged an appreciative approach, which is a mode of action research [4]. Appreciative inquiry focuses (in part) on what is working well. In this evaluation, all interviews, focus groups and document analysis looked at the strengths of the system, how it is being used to generate new and innovative ideas, and at "good, best or leading" practice. It is within this context that the evaluation sought to understand challenges, constraints and limitations of the MOSH process.

The key focus areas of the evaluation were as follows:

- Understanding the leading practice adoption system as it unfolds in practice from concept through to implementation i.e. the process.

- Assessing the performance to date of the Learning Hub, other key role-players and other component structures.

- Understanding the rollout of leading practices through the adoption teams.

- Evaluating the governance and accountability structures of the Learning Hub.

- Understanding the Learning Hub's relationships with stakeholders and other bodies in the implementation of the MOSH leading practice system.

- Understanding the division of labour between all the key role players with regard to the implementation of the MOSH adoption system.

- Reviewing the capacity of the Learning Hub, other key role-players and other component structures, within a changing mining environment, for meeting the system's mandate in future.

- Assessing the key factors which facilitate and/or limit adoption.

- Understanding how the process is currently monitored and evaluated.

As stated, the MOSH process was investigated at three primary levels:

---

[2] American Evaluation Association. September 2010. "An evaluation roadmap for a more effective government." P2. Retrieved 28 September 2011 at http://www.eval.org/EPTF/aea10.roadmap.101910.pdf
[3] Rossi and Freeman (1993) in "Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms." December 1998. Retrieved on 28 September 2011 on http://www2.ed.gov/pubs/EdTechGuide/whatseval.html
[4] Cooperrider, D., & Srivastva, S. (1987). Appreciative Inquiry in Organizational Life. *Research in Organizational Change and Development , 1*, 129-169.

- **Level 1: Governance and Oversight**. This included the MOSH Task Force, Learning Hub Advisory Committee, and stakeholders external to the Chamber of Mines like unions, and the Department of Mineral Resources (DMR).

- **Level 2: Resourcing and Capacity**. This included the Learning Hub, the MOSH Leading Practice Adoption Teams, the MOSH Handbook and all related resource materials both print and electronic, the training component and issues related to advice, support and budget.

- **Level 3: Operations**. This included looking at the implementation of the MOSH process at source, demonstration and adoption mines, the functioning of the communities of practice for adoption (COPAs), the MOSH champions, adopters and stakeholders and other involved implementers at the mine level (including but not limited to mine level Adoption Team managers).

These levels were chosen because they include and follow the process from the point of conception, to the point of implementation at a mine. The methodology adopted for the qualitative review comprised the following:

- **Document review and analysis** of all available documents relevant to the MOSH process. These included the MOSH portal, adoption team guidelines, the MOSH Handbook and guidelines, and notes and minutes of meetings of adoption teams and COPAs.

- **Face to face and group interviews with key informants,** mainly role players across the MOSH process, from Levels 1 to 3 (as above). The interviews were based on a predetermined protocol thereby following a semi-structured format. This provided guidance and direction for the interviewer but allowed for open-ended and spontaneous conversation. The purpose of the interviews was to gain an understanding of the MOSH process and how it has evolved over the years, across leading practice areas, across mines and across commodities.

- **Telephonic interviews with stakeholders external** to the Chamber of Mines. These were structured interviews as they had to be conducted within a limited time frame. These interviews helped gain an understanding of the degree of interaction and involvement of stakeholders external to the Chamber of Mines with the MOSH process.

- **Focus group discussions** with workers at the operational level (Level 3). These discussions were also guided by a semi-structured guide – providing guidance and direction but allowing for issues to be raised as they emerged. They were conducted in the preferred language of the participants, and were transcribed for the purposes of in-depth analysis. The focus group discussions attempted to understand what workers understood by MOSH, to assess their level of buy-in and participation and to elicit their view in terms of whether the leading practice has contributed to improved health and safety.

- **Underground/on site visits at operations** implementing a MOSH leading practice (Level 3). These visits were conducted with supervisors and other members of the technical team. A semi-structured interview guide was used, as well as observation. Questions and discussion through observations and review of any relevant documents and reports was also conducted during the visits, with the intention of understanding the practical and technical application of the MOSH leading practice.

The interviews and focus group discussions outlined above were conducted using a set of standardized qualitative tools. A total of 10 sets of research tools were developed. The tools probed the following, in varying degrees of detail depending on the level of involvement of the interviewee with the MOSH leading practice adoption system:

- Perceptions of the MOSH process;

- The evolution of the MOSH process;

- Barriers and challenges to implementation;

- Perceptions of the initial impact of the MOSH process; and

- Considerations of sustainability and scale-up.

Analysis and review of all materials collected through the desktop review and fieldwork has contributed toward the development of seven case studies across all leading practice areas. Of the seven leading practice areas, three were selected to provide a greater depth of analysis through day-long site visits to mines that have adopted a MOSH leading practice. Table 1 illustrates the leading practice area and mines that were selected for the three in-depth case studies.

Table 1: Mines Visited for the Evaluation of Leading Practice

Leading Practice	Source Mine	Demonstration Mine	Adoption Mine	Methodology
Dust: Foggers	Great Noligwa Mine	South Deep Mine	Matla Coal	Full evaluation and team mine visit Document based case study
Noise: Hilti Rock Drill,	Tau Tona	Moab Khutsong		Full evaluation and team mine visit Document based case study
Falls of Ground: Entry Examination and Making Safe	Impala Platinum	Consolidated Kloof Driefontein	Arnot Colliery	Full evaluation and team mine visit Document based case study

PART 2

3 THEMATIC ANALYSIS RESULTS

3.1 CROSS-CUTTING FINDINGS

There are unique characteristics across the governance, resourcing and operational levels of MOSH implementation; these are presented in each section. Certain features of the process are however evident across all levels.

- As with many change management processes, **the successes of MOSH have resulted from the behaviour of individuals and from inter-personal relationships**. This validates the understanding that drove the development of the MOSH process, namely that "Adoption is a human activity and the two most powerful influences on adoption are behavioural communication (modes of communication appropriate to different levels of employees and situations) and leadership behaviour (actions and inactions of leaders)"[5]. The quality of personal contact has resulted in a breakdown of traditional barriers, and a transfer of practical knowledge. This factor has significant implications for the future structuring, resourcing and sustainability of MOSH. Not least of these is the need to access or develop so-called "softer" people-related skills within the industry.

- **Leading practices are not viewed as being the "silver bullet"** that will address all OHS issues relating to their specific area of focus within governance structures. The leading practices are appropriately viewed as one element of the tool box that is needed to address OHS issues. *"MOSH will only be part of the overall solution. It's naive to think it is the only solution – it must be part of a range of activities."* However, this view is not always supported at implementation level. Within this context, it is important that each adopter is aware of the need to, and is able to locate each leading practice in its unique hierarchy of risk controls. There is also a tendency for the leading practices to focus on "end of pipe" solutions. There is a need to look at leading practices at the first level of the risk hierarchy, namely avoidance.

- **The intention of the process** – to facilitate the adoption of leading practices efficiently and effectively throughout the industry – **is counteracted by the reality of the process as conceived**. The entire leading practice process and its tools – including the Handbook – are perceived as too long, slow, cumbersome, onerous and complex. As a result, the impact is limited to a few specific mines rather than industry-wide. *"There is no visible/tangible impact on the industry as yet."* *"Not many people understand the principles on which the MOSH process is founded."*

- **There is considerable lack of clarity about the aims of MOSH.** The leading practice adoption system is variously described as promoting leading practices in pursuit of the goal of "Zero Harm"; as a leading practice adoption process providing tools for securing the input, participation and support of decision-makers and users; and as a strategy for achieving the 2013 health and safety milestones. This lack of clarity on intended outcomes spills over into the governance, resourcing and operational lack of clarity on various issues pertaining to the adoption process. This single factor undermines the development of an M&E framework for the MOSH Leading Practice Adoption System.

Where necessary to highlight a specific issue, the findings above are discussed further in the detailed sections that follow, with respect to governance, resourcing and mine site implementation.
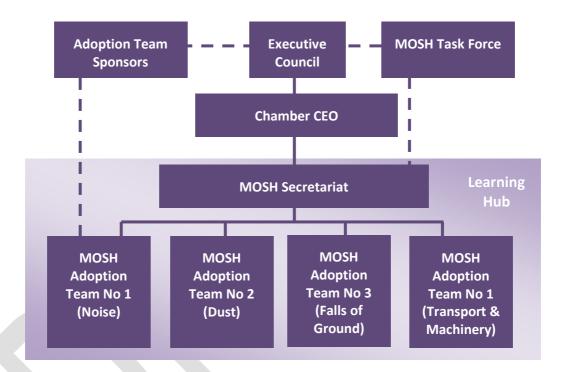
---

[5] Leading Practice Adoption Guide for the Hearing Protection Device: Training, Awareness and Selection Tool

3.2 GOVERNANCE AND OVERSIGHT

Figure 1 depicts the governance structure for the MOSH Leading Practice Adoption process. Located within the Chamber of Mines structures, the MOSH Secretariat, Task Force, Learning Hub, Adoption Team Sponsors and Task Force report to the Chamber Executive Committee. The structure is designed to function as follows.

The MOSH Learning Hub manages the MOSH Adoption System to maximise industry ownership and buy-in. The Adoption Team(s) are the system's primary delivery vehicle. The Secretariat provides guidance and support, and is intended to be the locus of institutional memory and continuity for the adoption system. The Adoption Teams are supported by sponsors, who are members of the Chamber's Executive Council, who are also tasked with strategic issues relating to MOSH. The Task Force ensures that Adoption Teams are well-aligned with industry needs, and communicates the needs of the teams to industry.

Figure 1: The MOSH Governance Structures

3.2.1 SUCCESSES

Personal interactions, via the site visits by Adoption Teams, as well as through the Workshops is **the most effective communication mechanism in MOSH**, and is the primary methodology for generating buy-in.

- *"(I am most proud of) the team members: they have excellent knowledge and the mine's representatives are the best in class."*

- *"The post-demonstration workshops are the most useful: listening and getting the direct experience."*

MOSH has been thoroughly successful in breaking down traditional hierarchical and inter-company barriers, which have been identified in safety literature as key obstacles to safety improvement

efforts[6]. The willingness of operations to share and cooperate on OHS issues is welcomed and noteworthy, and proves that OHS is no longer perceived by the majority to be a competitive issue.

- *"The silo mentality is starting to disappear; we are in this as an industry together. "*

- *"One benefit is that we now know the individuals personally; everyone can now approach and talk to even the executives about problems and challenges."*

- *"You must see this in light of the messages we get from the lawyers; I don't care – we share in good faith."*

- *"….the industry is moving and working together."*

The most effective interactions are those from within the industry, or its immediate suppliers, by people who have a lot of experience and/or knowledge.

MOSH has helped to dramatically raise the profile and awareness of OHS issues in the industry. It is uniformly perceived to be a "good project". An offshoot of this awareness and cooperation is that the industry seems to be more aligned on OHS issues.

- *"At least the CEOs are starting to sing from the same hymn sheet – we face the same challenges and are starting to get solutions."*

- *"MOSH is sharing good practice and raising awareness of certain very critical issues in mining."*

What is most powerful about MOSH is that it involves practical work, and is not just a paper-based exercise – this is the distinguishing feature from previous initiatives.

- *"It is a common approach based on proven technology – it's not pie in the sky dreams."*

- *"What is most important is that this is leading practice as opposed to just ideas. The most important factor is the very practical input at site level."*

- *"We'll come with firm proposals that are practical and executable. We are putting things in place that are practical."*

The practical input happens at senior level (Level 1), and at site/operational level (Levels 2 and 3), which can lead to the empowerment of workers to work safely and the acceptance of the leading practice by workers. Involvement at all levels is fundamental to successful safety interventions[6].

- *"External expertise has been very valuable."*

The achievements of the falls of ground team are widely recognised and are seen to have demonstrated the value of MOSH. This is attributed largely to the energy of the leadership of the team. The nature of the leading practice advanced by this team also plays a role - a legal requirement and a process which is generally well-known. This example, illustrates how MOSH can position leading practices strategically to obtain buy-in across the sector, deepen the understanding of MOSH adoption process on a broad front and achieve visible improvement.

The MOSH leading practice adoption system is founded on sound principles. At governance and implementation levels, people believe that the system is founded on sound principles – combining technical know-how to re-engineer aspects of mining and a process of engaging people. For example, the requirement to find out what users and implementers of leading practices think and believe has

---

[6] For more information on this issue, refer to Gunningham, N., & Sinclair, D. (2011). A Cluster of Mistrust: Safety in the Mining Industry. *Journal of Industrial Relations , 53* (4), 450–466.

produced tangible benefits such as deeper understanding of and support for leading practices. Also, at a number of mine sites members of the crews who participated in the focus groups stressed the importance of senior management respecting and listening to the views and concerns of workers.

- *"The principles and underlying concepts are sound..."*

- *"The change management methodology makes the difference."*

- *"MOSH is fundamentally a good system. Have proven that works and on the whole the process is working well."*

- The *"soft side"* is working well with *"hard core engineering"*.

- *"I don't know what the template is, but the concept is working"*

3.2.2 CHALLENGES

Within the governance structures, **MOSH is by-and-large seen as a process rather than leading practice**, but to what end is not uniformly articulated.

- *"MOSH is both leading practice and a process, and getting people to understand this is one of the biggest challenges in MOSH".*

There is very limited recognition that MOSH is trying to initiate a change in the way the mining sector operates – to "safe production", which would make the MOSH change process self-sustaining. One reason for this may be the lack of skills within the MOSH team and within industry to bring the "people issues" into the prominence that they warrant in a change management process [7].

- *"The people side is not highlighted sufficiently."*

- *"We need to find a better way to get the people issues on board. The people aspects are not being given the kind of attention it deserves."*

- *"It's not about the leading practice but about the adoption thereof."*

MOSH appears to lack a coherent and consistent strategy, value base, set of expectations and governance plan. Strategic governance appears to be fluid and changeable. No person interviewed perceived themselves as being involved with strategy development or governance; this was seen in a few cases as being the responsibility of the MOSH Secretariat and others as the role of the Coordinating Committee. This lack of definitive strategy has had significant knock-on effects throughout the programme, as highlighted in the following bullets:

- Because form (structure/s) follows function (as determined by strategy), the lack of an assured strategy has led to **the MOSH structures, their relationships and people's roles within them not being consistently understood**. MOSH governance appears to be "everybody else's" responsibility. It is possible that this is a result of (perhaps unconscious) resistance to the process[8].

  o *"Where should the strategy be developed – perhaps the MHSC?"*

  o *"There is no process for targeting problem companies."*

---

[7] For more information see Berlin, A. (2011). The EHR - Exercises in Human Resistance. *iHealth Connections , 1* (1), 54-56.

[8] For more information on perceived resistance to change processes see Agocs, C. (1997). Institutionalized Resistance to Organizational Change: Denial, Inaction and Repression. *Journal of Business Ethics , 16*, 917–931.

- o *"The learning hub, as far as I'm concerned is still just something on paper. I haven't seen it in action."*

- o *"I know that we paid a lot of money to get it (the learning hub) established, but I know nothing about it, and it has no impact on me at all."*

Of specific concern is the MOSH Task Force. It is seen as dysfunctional, having been there for the establishment phase and not being in a position to support the roll-out of the programme. The Task Force is not functioning as originally envisaged, is largely unclear about its role and is perceived as not making an impact. The Task Force spends 50% of its time on aspects other than MOSH Adoption System. The role of the newly established Advisory Committee/Group as regards the Task Force is not apparent.

- o *"It is not clear who will be answerable to whom?" (With respect to the Task Force and Advisory Group).*

Examples of some effects of the poorly articulated strategy are highlighted in Box 1.

BOX 1: THE IMPACT OF MOSH STRATEGY ON DELIVERY

There are three aspects of MOSH strategy that appear to impact on delivery. The first is holding a common understanding of what is MOSH, how it is measured and where it is going to. The second is the difficulty of implementing leading practice in the absence of strategy and the third is whether the MOSH process as envisaged in the handbook works in practice.

Vision, Definitions and Indicators

The majority of role-players involved with **implementation** put the emphasis on MOSH being about leading practice rather than a "process" of adoption - *"Finding leading practice"* and *"Sharing leading practice."* This is in contradiction to the findings at **governance** level. Similarly, alongside this a smaller number of voices in the implementation team are saying, *"MOSH is a comprehensive change management system"* and *"MOSH changes the occupation health and safety culture in the industry"*. Everyone does agree that the purpose of MOSH is to improve health and safety performance and that the impact should be found in health and safety performance data. The 2013 milestones are the most frequently quoted target.

During the design phase of MOSH little attention has been paid to consistent measurement of success. Nobody interviewed could provide or quote any hard measures of success although site visits to mines indicate that OHS data is available to substantiate the impact of some leading practices. The "number of mines adopting" is the most widely quoted measure of MOSH progress. In some cases teams have broken this down into steps of engagement with a mine to provide more meaning to the process of a mine adopting. This measure is however less useful when the process of adoption is slow, inconsistent or constrained by technical or other difficulties.

- *"There is a leading practice monitoring report. It was agreed at the last meeting to revise this because very little activity gets captured or is shown on the monthly monitoring chart, it looks like the same thing happens every month, it doesn't provide for new leading practice areas to be added…"*

- *"Evidence is general in nature, and not for any specific area."*

Thus, despite the clear vision, the specific objectives of MOSH are unclear.

- *"Impact measurement is not working well."*

- *"Measurement of MOSH success could be company specific. This will mean that there are indicators for different levels of MOSH".*

Perspectives on specific objectives from the interviewees vary: (i) meeting the 2013 milestones (ii) reducing fatalities (iii) creating a single industry standard (iv) maximising the number of mines that adopt leading practice (v) enhancing skills of workers and (vi) serving as a culture transformation framework.

It is further acknowledged that there are no measures of the "people process" or "change management process" embedded in MOSH. There is a lot of uncertainty in the teams as to how this could be done. Emerging from the school of thought that "MOSH is a process" is that MOSH has the potential to support a range of initiatives from HIV and AIDS/TB mitigation to culture transformation. The implications of this are significant for MOSH and don't necessarily reflect the thinking or the expertise of the majority of individuals presently implementing MOSH. It also has the potential to overwhelm MOSH and to lose the crux of MOSH; namely that it is about both a process of working with people and technical improvements through either technology transfer or review of methods of working such as entry examination making safe.

- *"MOSH is becoming bigger than intended. Now looking potentially at issues to do with transformation, TB, HIV and AIDS."*

It may be important for the implementation team as a whole to consider how important it is to share and communicate one integrated view of "what is MOSH".

The MOSH strategy

In the absence of a consistent and well articulated MOSH strategy some of the Adoption Teams sit with issues that they are unable to resolve. This creates uncertainty in the Adoption Teams and a potential loss of direction and momentum. There are several examples of this. The first concerns the Dust Adoption Team and the second The Transport and Machinery Adoption Team. In the Dust Team it is acknowledged that some leading practice technologies promoted through MOSH sit low down in the hierarchy of controls and pose a dilemma for practitioners who understand first principles.

- *"The first principle for dust in mines is to capture dust at source, use bypass chutes and downcast ventilation systems."*

The implications of this are that dust should - where possible - be dealt with through appropriate mine design. This was highlighted in one particular interview where the question was asked by the interviewee *"What is MOSH doing about mine design to ensure that leading practice is high up the hierarchy of controls?"* While other controls are important, they are not a substitute for action at this higher level of the hierarchy.

Leading practices also cannot be taken off the shelf; they must be a well-reasoned component of an existing strategy to manage health and safety. It should not be leading practice for the sake of leading practice it must be based on risk management. Without a more sophisticated strategy MOSH could be accused of simply "selling" leading practice.

- *"Mining Charter both a driver and now a threat (compliance thereof). Not based on risk management but expectations of implementing a leading practice."*

The Transport and Machinery Adoption Team have the huge task of demonstrating the proximity device in three different settings, coal and hard rock trackless and hard rock rail bound machinery. The thinking behind this is that it is important to keep all players on board across different commodities. This is despite the fact that this doesn't translate into a sound approach to MOSH implementation. There simply isn't the capacity without an Assistant Adoption Team Leader to manage three demonstration sites in the Transport and Machinery Adoption Team. Rather this dilemma should be managed at the level of strategy by targeting the MOSH intervention appropriately. Again the danger of not elevating the right issues to the level of strategy is that the Adoption Teams cannot function effectively. Instead the Adoption Teams potentially feel overwhelmed by an impossible task and lose motivation.

- *"We felt people will respond negatively to us if we just select hard rock and rail bound transport, although this is where the number of fatalities are found – we haven't targeted our intervention."*

- **The process of roll-out is seen to be too onerous, and/or complex**.
  - *"It's too many steps and the challenge is to make it much simpler…..We are adding too much complexity to a simple matter."*
  - *"It is too onerous".*
  - *"…it worries me that we are moving too slowly."*
  - *"It is too complex"*

  o *"There are too many steps and it is too slow. We need to simplify it."*

- **A coherent communication strategy is absent**. Communication is viewed as insufficient, too narrowly focused in some cases and too generalised in others, overly reliant on individual feedback and specific industry meetings, and is largely uncoordinated. It would appear that no-one is formally tasked with engaging external stakeholders on MOSH.

  o *"I do not have specific channels (for communication) – all communication is being treated by the MOSH people." (Adoption Team Sponsor)*

  o *"Communication is very poor."*

  o *"We haven't made much inroads down to the coalface."* (With respect to communication).

  o *"The Task Force doesn't engage with other stakeholders."*

  o *"(One person) in the Secretariat engages with other stakeholders."*

- **There is significant concern over the sustainability of the MOSH efforts**; this points to the absence of a coherent long-term strategy. The current change in phases – from design to adoption – makes the governance even less clear.

  o *"Who will take ownership of and accountability for work done – CoM Executives"*?

  Representivity on structures is very important but is currently unclear, as are the lines of responsibility between MHSC, CoM and MOSH officials. In addition, "*the Chamber has not yet decided whether to keep MOSH on as a permanent feature of the Chamber, or to end it as a 5 year project."* Further concerns are expressed below:

  o *"Maybe complacency will set in: it's the biggest danger in the mining industry."*

  o *"But we need full time resources to assist with implementation."*

  o *"Sustainability! How do we keep this going? Change management must be ongoing. It must not be associated with a specific leader so that when he leaves, the practice falls flat. We need enough traction in the whole industry to keep this alive."*

  o *"The ownership by the mines is something that I am concerned about – sustainability is the job of the mines."*

  o *"The critical thing is to keep the process fresh and not let it get stale. How do we refresh and revitalize on an ongoing basis to keep it alive? That's the challenge"*

  o *"We must convert it from being a campaign (a project for a period of time) into standard management practice and remove the temporary nature from it."*

- The need for a "**new strategy" post-2013** has been voiced.

  o *"…we need to move beyond the 2013 milestones."*

  o *"If we achieve the 2013 targets, then we can use MOSH to help drive the "2023" targets."*

  o *"The present MOSH structure could be limiting over time."*

  o *"We can (work) through the MHSC…because some mines are not represented through the Chamber."*

People at the governance level also had much to say about the **implementation of the MOSH Adoption System. T**hey recognise that there is **heavy reliance at many levels on individuals to carry**

the process and the related leadership efforts to fruition, without adequate succession planning in any of the structures. This had affected implementation, and threatens the sustainability of the programme. Frequent personnel changes, within the Adoption Teams and Task Force erode institutional memory – a not untypical issue in maintaining safety change processes[6]. The lack of reporting on actual outcomes (for example of the mental models work), as opposed to on adoption progress, compounds this. The practice of secondments is seen to have failed, citing lack of clear criteria for choosing appropriate secondees, lack of suitable contracts and consequent frequent changes.

- *"There is too much movement in the team leaders"*

- *"…… is like a bulldog – the one reason why there is more adoption – it is driven by this individual."*

- *"Adoption Team members and COPAs do not always have the right people…"*

- *(The sustainability of MOSH) "relies on key decision makers being part of it….or else the MOSH process will fall flat."*

- *"It appears that the members of the MOSH Task Team don't give reports back to the executives of companies."*

- *The two year secondment doesn't really work for MOSH."*

At the governance level difficulties with implementation are also reported - **the principles of MOSH are supported but implementation is difficult.** This is so from CEO to operational level, and even at the Chamber. Reasons cited for this include a feeling of being conscripted; budgetary constraints; the "not invented here" syndrome (lack of ownership); that the 48 step process is far too onerous for practical purposes; a fear of failure in light of the resources that have been dedicated to it (this with specific reference to the Chamber's inability to hear negative messages arising from the MOSH process); it is seen as a Chamber initiative, rather than an industry-wide process; and legal pressures to not disclose. MOSH is further perceived to be resulting from primarily "push" factors (externally imposed) rather than pull (being called for from within the industry). This can enhance adoption struggles[8].

- *"The view of the CEO of the Chamber is that MOSH should not impact negatively on the Chamber itself."*

- *"(The biggest obstacle is) the "not invented here" resistance at the lower levels of the organisation. This is a serious communication challenge – internally for organisations and externally as the MOSH team".*

- *"There is resistance from operational management to the implementation steps, with a "why bother" attitude….. There is too much box ticking…."*

- *"I feel that the Chamber of Mines MOSH leadership is a bit quiet…..MOSH cannot be managed by remote control. "*

- *"…but when you've dealt with most of them, you end up with rocky ground – issues of resistance to change, not my idea, not invented here. Finding ways around that is important for MOSH."*

- *"MOSH will be successful when the "not invented here" syndrome is overcome."*

3.2.3 Conclusions and Recommendations

With specific reference to addressing the governance challenges within MOSH, the following should be considered:

- The fundamental principles in the MOSH process ring true for all stakeholders in the sector and have been shown to make a difference at individual operational level.

- Ambiguous governance processes and structures, as well as a lack of uniform understanding of the strategy has had significant knock on effects throughout the adoption process. Not least of these effects is poor communication, lack of clarity on specific objectives, and functional discontinuities within MOSH.

- The strategy must be revisited, and the functionality determined that is required to deliver on strategy pre- and post-2013.

- The structures (form) must then be redefined to accommodate the revised strategy (function).

- Examine the basic governance processes including criteria for key personnel.

3.3 RESOURCING AND CAPACITY

The implementation of the MOSH System is primarily organised through four Leading Practice Adoption Teams, operating in part out of the Chamber of Mines. A lead and assistant Adoption Team Leader staff these Adoption Teams. The MOSH system is built on the assumption of industry involvement and these key posts are largely filled by industry secondments. Technical assistance is provided by Dr. John Stewart (local mining consultant) and Decision Partners (a Canadian consulting company).

The Learning Hub was established at the Chamber of Mines to provide a more significant resource for MOSH rollout. The Learning Hub includes a Head, a behaviour change specialist, a monitoring and evaluation (M&E) specialist and adoption facilitators (four of these, one for each adoption area). To date the Head, the behaviour change specialist and the M&E specialist and one adoption facilitator are in post. Other types of *ad hoc* support available to the MOSH Adoption Teams are the Communication Facilitators (attend meetings, give presentations on the behalf of MOSH and/or represent MOSH at key stakeholder meetings) and the Adoption Sponsors (industry representatives who support the adoption teams). The MOSH Task Force supports the rollout of leading practice by identifying adoption mines and in some cases identifying the potential secondees to the Adoption Teams.

The Adoption Team Leaders are responsible for the implementation of the MOSH process. This essentially involves the identification of leading practice, the documentation of this at a source mine, the introduction of the leading practice into a demonstration mine, and the establishment of a COPA leading to widespread adoption.

One of the key observations that can be made about the findings of the MOSH evaluation is the similarity in the comments made by participants from both governance and resourcing and capacity levels of the MOSH Adoption System. This probably reflects the fact that MOSH governance and strategy is not clearly differentiated from MOSH implementation, and that individuals hold multiple portfolios.

The results of the resourcing and capacity level evaluation therefore focus on the strengths and weaknesses of MOSH implementation as it is presently organised at the Chamber of Mines, specifically through the Learning Hub. Many of the individuals interviewed at this level shared the views expressed in the governance section.

3.3.1 SUCCESSES

At an implementation level, the overwhelming message is that **the success of MOSH is owed firstly to the quality of the Adoption Teams** (as illustrated in Box 2) and secondly to the **soundness of the MOSH process**. There is a sense across all interviewees that behind the scenes a lot of the right things are happening:

- *"Behind the scenes, data gathering and determining what systems we're going to use. We'll come with firm proposals that are practical and executable. We are putting things in place that are practical."*

- *"The MOSH Adoption Teams are very competent and dedicated. The MOSH team as a whole is pushing towards the same goal."*

- *"The way teams are structured is appropriate."*

- *"The Adoption System itself is a leading practice and the Chamber of Mines should feel proud of this. It is a powerful process which will produce tremendous results."*

- *"People do see the benefit of this process. The impact of this process is great. The soft side is working."*

BOX 2: EXPERIENCE OF ADOPTION TEAM LEADERS IS GREATLY VALUED

Concern was raised at the governance and oversight level about the age (near to retirement) and lack of diversity (no back-up) among Adoption Team Leaders. This issue was not specifically probed, but the following comments from people at operation level, give insight into the profile required of this key group of people.

- *"People with fantastic experience and knowledge like ..... could spend a whole month on the mine. We need more hands to help with facilitation."*

- *" .... came out of the industry and into MOSH from a senior position. He knows how to make the industry work for him and it shows in MOSH."*

Individuals are also making observations about what makes for a difference in implementation, such as the **emphasis on having a champion and face-to-face interactions**. There are no substitutes for building relationships when it comes to implementation. This includes the role of COPAs that are cited as successful because of the opportunity to meet face-to face. Experience shows that a COPA is unlikely to run itself, however, and is an illustration of the time and energy the Adoption Team leaders need to personally invest to ensure success.

- *"A good champion can be greater than the need for a smooth process."*

- *"Face-to-face meetings are important in practice."*

- *"The COPA does not run itself. (One person) does it …. when (this person) retreated from this role, the process came to a halt."*

Finally, MOSH has a complex project structure that is premised on industry involvement and external technical expertise. **This structure has had success** because MOSH has developed both the tools and process to support adoption, identified relevant leading practice that industry is responding to and achieved significant rollout of the Entry Examination Making Safe.

3.3.2 CHALLENGES

It is in the nature of projects to face challenges in implementation. The MOSH Leading Practice Adoption System must move successfully from an intense design phase into a phase of rollout and delivery. MOSH has made some changes to accommodate this but continues to face serious bottlenecks that hamper delivery. These bottlenecks described below are particularly pressing given that the 2013 milestones are less than two years away.

3.3.2.1 THE IMPLEMENTATION ENVIRONMENT

The Adoption Teams work in a very difficult environment, which will have a profound impact on how implementation proceeds. Probably the two areas of most significance are (i) the plethora of

initiatives that the mining industry is responding to including MOSH and (ii) the impoverished state of worker –management relations in some mines. The latter has a profoundly negative effect on the success of change management initiatives [6].

- *"People have got overwhelmed in the mining industry by all the different initiatives. Management's focus keeps reducing as they start new initiatives."*

- *"Supervisors still shout, swear and lie to workers. Production overrides everything and people believe you "can't be softie". The hardness towards people is about meeting production targets. Politeness not part of mining's legacy."*

One of the biggest blockages in MOSH is that it is seen to be yet another initiative and current priority, that is competing for resources and attention with other issues, including production, carbon taxes and nationalisation. For implementation of MOSH to be sustained it is critical that MOSH is not positioned as an add-on or nice to have. It "must be simply be part of safe production." This point is returned to again in a discussion of advocacy and communication.

Changing the culture of working in mining remains a serious challenge. An untested hypothesis of the evaluation team is whether "adoption" can effectively happen on mines where there isn't a culture of some respect between management and workers. For the adoption process to be effective there needs to be a sincere personal commitment to understand and value the contributions and beliefs of others [1]. For example, the health beliefs of workers can be a challenge to others who do not hold or understand what informs those beliefs. There are no short cuts in changing a culture of working. It usually starts with individuals deciding to do things differently[1]. The MOSH implementation team needs to model an approach to working that embraces respect, learning and diversity. Diversity includes race, culture, age, experience and professional training. Collectively this can make for a very dynamic team. It is essential that within MOSH, there is a culture of listening and learning from each other. It is this lived experience that can then be taken out into industry,

- *"Industry needs to learn and behave like a learning industry."*

3.3.2.2   THE LEARNING HUB

The Learning Hub is almost unanimously reported as not functioning properly and as having no impact. In addition, the implementation of MOSH is under-resourced (budgetary and human resources) due to the lack of strategic clarity. Not everyone in the MOSH implementation team agrees with the present structure and/or focus on building the Learning Hub.

- *"MOSH must build capacity in industry but it is now building organisation in the Chamber of Mines and people are standing back."*

However, other individuals point to the absence of the Learning Hub as one of the significant difficulties that has hampered MOSH delivery.

- *"MOSH isn't and hasn't been adequately staffed. It can't be successful if it is not adequately staffed."*

- *"The Learning Hub is only in place now and it was difficult to function effectively before that."*

The pressure on the Learning Hub to prove its value is tangible. This is most often expressed through a desire for greater visibility for MOSH and for effective leadership. There are two significant gaps in the present functioning of the Learning Hub: (i) an effective communication and marketing campaign and (ii) leadership. One respondent captures the danger of not fulfilling these roles,

- *"The Learning Hub as far as I'm concerned is still just something on paper. I haven't seen it in action –that's probably because they still need to make the appointments. But the learning hub must be active, not just another office bound bunch."*

Communication and Marketing

As at the governance level, many respondents had comments to make about communication at implementation level. This includes communication with external stakeholders as well as internal communication. With respect to implementation, the key stakeholders are those who can open doors for adoption at mines. Whilst there is support for the DMR to help drive a process of adoption there were no direct comments about how to engage with the DMR. There were also very few comments about the participation of labour other than the difficulty of knowing how to engage the different structures at a mine level.

- *"Communication and marketing not working for the Adoption Teams. MOSH should be visible. We need a full time marketer."*

- *"Mine managers need to be reached communication facilitator role must be redefined."*

- *"The strategic communication plan is not working. We do not therefore keep industry on our side, everyone aligned and the process supported. This hampers the programme and the involvement of industry can be lost."*

- *"A comprehensive communication strategy which was to have been undertaken in parallel to the evolution of the adoption systems was not done."*

- *"Because …. is no longer the link person for MOSH with SACMA the focus is no longer there for the coal sector. These things need to be maintained."*

The communication gap with external stakeholders has a few dimensions to it. Firstly creating awareness of MOSH and the progress of MOSH to all external stakeholders is an on-going task and aligned with the point above that MOSH needs to be positioned as a part of safe production and not an add-on activity. Secondly the lobbying of external stakeholders for support should be strategic. The absence of such a strategy exacerbates the widely expressed frustration with the MOSH Task Force who, it is believed, should play a bigger role in driving adoption. Without an effective communication campaign MOSH is entirely dependent on the Task Force or on individual Adoption Team Leaders effectively championing roll out. For effective rollout MOSH needs mines to request support and participation – in other words the "pull" factor referred to in the previous section.

- *"There is a disconnect between MOSH intention and really reaching into board meetings; is it on the radar of board members, the company executive, the general manager and then people on the mine?"*

Internal communication gaps also need management. The members of the Learning Hub and the Adoption Team Leaders do not share physical office space. Team Leaders often only go to the Chamber for meetings. *"There is probably too little communication between the four MOSH task teams"* and *"I occasionally meet … (a key person in the structures)."* The management of a diverse group of individuals who largely manage themselves outside the office needs careful attention. Meetings should be used as an opportunity to build effective communication and feedback not just report on deadlines. Good management practice is at the heart of the MOSH process and this needs to be at the heart of the Learning Hub.

- *"Not enough credit is given to the spirit and dedication of some of the people involved with MOSH. Recognise people and their accomplishment."*

Leadership

Leadership is the second significant gap in the Learning Hub. This gap is perhaps a statement about the Learning Hub as a whole rather than any one key individual. However there is opportunity for the Head of the Learning Hub to play a very dynamic role. There are however, a number of factors in the broader environment that may obstruct this from happening. The first is a legacy of mining culture that doesn't easily embrace individuals who come from outside the sector or who don't have a long track record of mining experience in the industry. The second is the legacy of decision making in the MOSH Project that impedes individuals taking responsibility at the right level of decision making.

Primarily this is about who should take responsibility for decisions related to strategy and who is responsible for decision-making related to implementation. At present the decision making process is too open and no one is really accountable. This is also reflected in comments about roles and responsibilities.

- *"Learning Hub needs individuals with credibility"*

- *"If a person is not a recognised leader in the industry then you can't succeed. We need a stronger leader who can drive MOSH."*

- *"Decision making in MOSH is very consultative including the MOSH Adoption Teams, Co-Ordinating Group, MOSH Task Force and a committee with the Chamber at which the principals of the Chamber meet,"*

By strengthening accountability and decision-making and by establishing an effective multi-disciplinary team the Learning Hub can do a lot to address the leadership gap.

3.3.2.3 ROLES AND RESPONSIBILITIES

The roles and responsibilities for MOSH implementation are primarily held in the Learning Hub and with the Adoption Teams. The Learning Hub is a relatively new structure. Many posts are now filled and the opportunity is there for it to meet or exceed expectations. A couple of key posts such as that of the behavioural change specialist and the monitoring and evaluation specialist are now filled.

Around the Learning Hub are a number of structures that also support implementation. These are the MOSH Task Force (constituted by external industry representatives) and the MOSH Co-ordinating group (Internal management group of senior COM officials). A recent initiative is to establish a MOSH tripartite Advisory Group. Although there has been consultation about this a first meeting has yet to be held. Very little was said by respondents about the MOSH Advisory Group. In contrast, there is huge expectation within the MOSH Project that the Task Force, in particular, will open the way to widespread adoption. This assumption needs revisiting in the light of current experience, because it may not be possible as originally perceived. A key strategic issue for the MOSH project in this next phase of development is "how to drive the process of adoption."

- *"I don't see the input of the MOSH Task Force into the process. It doesn't seem to sink in or perhaps guys are not aware of their responsibilities. I would like the MOSH Task Force to support the MOSH teams. We need the MOSH Task Force to open the way to speak to mine level participants."*

The MOSH Coordinating Committee meets regularly with the Head of the Learning Hub. This is an excellent mechanism for creating accountability to the Chamber of Mines and clearly is an important sounding board for developments across the programme. However, this can also potentially dilute decision making if the Head of the Learning Hub is not able to move ahead effectively at times without consultation. Also the Head of the Learning Hub must manage the role of the Task Force so that there is coherence across all levels of the Project. A single person held the MOSH project for a long time and was even referred to as "Mr MOSH" by one respondent. The effective transfer of roles and responsibilities in the MOSH Project would benefit from a review.

Section 13 of the MOSH Handbook describes the "effective utilisation of sponsors." Although this role is outlined in detail no one referenced this and rather confirmed that the role of the Adoption Team Sponsors is not widely understood.

- *"It is not clear what is the role of the sponsors. How should the sponsors be influencing the executive council member? Can they support us in driving advocacy for MOSH?"*

- *"The role of the Leading Practice sponsors is not working as planned. The sponsor is not supposed to do the communication, but to assist when there are problems."*

- *"…my sponsor is looking for a secondment."*

It would appear that sponsors fulfil a number of roles in the MOSH Project that are currently not optimal including communication (a gap identified above) and securing secondments. In contrast, despite the enormous challenge of being an Adoption Team Leader, individuals are successfully fashioning this role by recognising the need to complement technical skills with process skills. The more experienced team leaders recognise that their role is primarily to facilitate and support change.

- *"There are a lot of expectations of the Adoption Team Manager and this is hard to fulfil without enough expertise, for example behaviour change specialists."*

- *"The Adoption Team leaders should be coaches."*

- *"Adoption team leadership is "translation role" as mines must own and manage the process, and quantify the impact."*

There are some areas of weakness that reflect the lack of capacity in the present MOSH implementation team to deliver in these areas. The first is the inadequate documentation of the MOSH Project in general and the second the capacity to conduct good quality dialogue interviews. Both of these areas are essential to the adoption process and progress falters when there is inadequate capacity to complete these tasks. The MOSH Learning Hub should address how to secure this capacity for the future.

- *"Documentation is a weakness. All teams are short on documentation. There is insufficient documentation because adoption team members are not report writers."*

- *"The dialogue based interviews are a real challenge."*

Administrative and secretarial support in the Learning Hub to manage stakeholders, set up meetings including the MOSH Task Force and monthly meetings of the MOSH Adoption Teams is also inadequate. The current plan is to use the M&E Specialist to support this. This is a mistake given the pressing needs to monitor progress and measure impact.

Staffing and Secondments

Staffing the Learning Hub and the Adoption Teams for delivery beyond the design phase of MOSH is a challenge. Significant progress has been made towards meeting this challenge. The Chamber of Mines is investing approximately R26 million on an annual basis to staff MOSH. Industry secondments have happened and the Adoption Teams have high calibre individuals leading the process. The challenges facing MOSH are the difficulties in securing these secondments on an on-going basis, managing the regularity with which individuals may exit the project and how to effectively induct individuals quickly into the MOSH programme. For example, the Transport and Machinery Adoption Team have been without an Assistant Adoption Team Leader for six months.

MOSH has also benefited and relied significantly on outside technical expertise. Dr John Stewart and Decision Partners have had a huge influence on the design of the MOSH Project. There is some acknowledgement that these relationships must change over time and MOSH should be able to sustain itself or draw in alternative technical assistance as and when necessary. Some individuals work in a part time capacity as communication facilitators and have also contributed to MOSH implementation.

How to involve industry in driving the process of adoption and the appropriate staffing the MOSH Adoption Teams is a strategic issue for MOSH. Given the complexity of the process of adoption MOSH will need high calibre individuals to contribute to the adoption process. The role of expertise both technical and that gained through age, wisdom and experience should not be marginalised in favour of an approach that overly relies on MOSH trainees. The experience and calibre of individuals in the present MOSH Adoption Teams is highly rated outside MOSH. *"We will be successful when individuals are voluntarily seconded to MOSH. Currently it is like pulling teeth."*

- *"If any opportunity arises then I will give a months' notice and go back to (my company) …..sooner. It is quite likely I will go back sooner."*

Technical expertise

Given the diverse nature of MOSH work, external technical assistance is a flexible and very helpful method by which to secure the necessary skills. However it is an observation of the evaluation team that people should be accountable for technical assistance. Whilst there is widespread agreement that a lot has been achieved for MOSH through the inputs of consultants, lack of accountability has potential pitfalls. For example, "mental models" is an IP protected method to explore the health beliefs, attitudes and values of workers and supervisors through a structured interview process. Within the discipline of public health this process of working is commonplace and usually utilises qualitative research methods that are non-proprietary.

- *"…has been searching for experts, a range of experts who can bring different expert   dimensions to bear. For example air sampling alone is a specialist area."*

- *"I informed the communication facilitator of my strategy but the availability of this person   didn't align. These people are not full time…"*

3.3.2.4   TOOLS AND PROCESSES

The MOSH Leading Practice Adoption System which comprises (i) structures for leading the initiative, (ii) providing support for and overseeing implementation, and (iii) processes for conducting workshops and undertaking the key activities, is documented in detail in a Handbook. The Handbook runs to several hundred pages and is intended to serve as a resource to anyone concerned with improving "performance through the adoption of better technology and practice" (John Stewart, *pers. comm.* 2010). The Handbook is the principle tool for the adoption system. Other tools are available, and include a web-based portal, a DVD and several brochures.

This section of the evaluation report describes the various tools. Section 3.3.2.4 following provides perspectives on these tools, including an assessment of the extent to which these tools, especially the Handbook, are known, used and applied as intended. The value attached to the tools is also discussed.

The Handbook

The Handbook comprises 16 sections and describes a 48-step process which starts with the planning of a workshop, one purpose of which is to identify potential leading practices, and ends with the development of an updated user guide for the leading practice under consideration.   The main elements in the process as per the Handbook are:

- **Pre-planning for a workshop of industry experts**. This includes assessing management orientation at the adoption mines, reviewing previous work and relevant statistics; identifying stakeholders, risks, useful R&D outcomes, potential leading practices and trends; and finalising the programme and participants of the planning workshop (10 steps in this element).

- **Workshop based planning**. At the workshop leading practices are assessed, 3 leading practices with the best potential are identified and evaluated, the most promising leading practice is selected, a preliminary action plans is prepared, potential demonstration mines are identified (only one needed),   stakeholders and adopters are identified for behaviour based planning , and a preliminary value case is prepared. This accounts for 12 steps in the overall process.

- **Post-workshop planning and implementation**. The 26 steps which follow the workshop cover documenting the leading practice, identifying adoption mines, developing behavioural interview protocols, conducting interviews, documenting leadership behaviour plans and behavioural communication plans, continuing to develop the value case, formalising an agreement with the adoption mine, conducting a workshop at the adoption mine, implementing the leading practice and the behavioural and communication plans, preparing a demonstration project report, writing

a leading practice adoption guide, and establishing and facilitating a COPA for the leading practice.

A total 52 of worksheets and reference documents are available to guide each step in the process and include example plans for demonstration projects and Adoption Teams.

The MOSH Portal / Website

The MOSH portal has a section which is open to the public and a section which is password protected. The latter can be accessed by participants in the MOSH adoption process who obtain their passwords from the custodian of the portal. The public section has documents which explain the "road map", behavioural communication theory, and slide presentations of some leading practices such as the fogger and the entry examination. The working documents of the leading practice adoptions teams, including presentations and worksheets are available in the password protected section. Draft leading practice adoption guides and descriptions of various leading practices or potential leading practices are also available in this section. The evaluators observed firsthand that the titles of documents are not necessarily indicative of their content and downloading documents can be time-consuming. As the evaluation process unfolded it became apparent that there are many more documents circulating in the MOSH adoption system, than are available on the portal.

The DVD

A DVD which describes the MOSH Leading Practice Adoption System is available. In the opening sections of the DVD, leaders in the Chamber of Mines and of major mining companies introduce the system and speak of its importance. A number of these individuals no longer occupy the same positions in the Chamber and in the sector, as they did at the time of the making of the DVD.

Brochures

Three brochures on the MOSH Leading Practice Adoption System are available, the latest two of which were produced for a recent health and safety conference. The latter describe respectively the leading practice system and the six leading practices which are currently being promoted. The first brochure produced after the launch of MOSH is the most widely circulated.

Mental Modelling, Leadership Behavioural Plans and Behavioural Communication

Strictly speaking mental models, leadership behavioural plans and behavioural communication plans are integral to the adoption system and are addressed in the steps, templates and reference documents provided in the Handbook. However they occupy a special place in the system and are the basis for describing the system as "people-centred".

Mental models describe the knowledge, beliefs and attitudes that shape decisions and actions of people. In the adoption system the key people are managers, supervisors and workers on mines where new technology or new ways of doing thing are adopted.   Mental Models are obtained by conducting interviews using a standard interview protocol at each mine site, for each leading practice.   The interviews are analysed to distil the mental models of those interviewed and leadership behaviour plans and behavioural communication plans are then developed.

Leadership behavioural plans guide actions of those who lead and/or supervisor the workers who actually implement the new the technology or practice, and are intended to support, reinforce and sustain implementation.

Behavioural communication plans are intended to address the barriers to adoption identified through mental modelling. This is done by providing people with information which addresses misunderstandings, and their fears and concerns.

Together these elements are the "involvement and engagement" aspects of MOSH.

3.3.2.5   PERSPECTIVES ON THE MOSH TOOLS

The perspectives presented in this section are mainly based on the interviews and focus group discussions involving over 70 people conducted at mining operations and elsewhere. All the interviews were analysed to search for themes and issues related to the use and application of the MOSH tools. Unattributed quotes are presented to allow the voices of the participants in the MOSH Leading Practice Adoption System to be heard and to provide insight into the context in which the tools are applied. Secondary sources are the minutes of Adoption Team Meetings and presentations made to various industry stakeholders.

The Handbook Is Comprehensive but Intimidating, and Should be Simplified

The Handbook was described as comprehensive and necessary but intimidating.

- *"The materials are very extensive."*
- *"The book is necessary. People need this resource."*
- *"It is necessary to have the Handbook, but as a reference."*
- *"Many people are blown away by the massive manual."*
- *"People cannot cope with a big book."*
- *"There is realistic stuff in the Handbook, but when you start reading, you can get scared, the principles are there, but going through it step by step is painful."*
- *"People block off when they see the current Handbook."*
- *"The Handbook is very thick. It is difficult to read and grasp everything in the Handbook. It is also very comprehensive – can go to war with it."*

Everyone involved in the rollout of the MOSH adoption process or with an operational role in mining, who had seen or worked with the Handbook believed it should be simplified. The view was also held by most people on the Task Force and a number in the governance structures. There is, however, also a concern that all the steps were necessary and it would be difficult to judge which steps to omit.

- *"The Handbook should be simplified. It should be user friendly for the mines and the champions in mining groups. These are the people who should take control of MOSH. There are too many steps and too many templates."*
- *"There are too many steps and too many templates. The current process is about 12 months in length - this is to get to the demo. Some steps are more important than others (I can't define this offhand)."*
- *"It is necessary to have the Handbook, but as a reference. A simpler Handbook is needed for the adopters. The Handbook is very academic."*
- *"It must be simplified"*
- *"The Handbook needs to be simplified."*
- *"I would say cut the detail to 60% of what it currently is."*
- *"It is a good rollout philosophy. But the Handbook must be simplified so that people can read it and get involved."*

The Handbook is already being simplified and adapted for mine level application by Adoption Team Leaders who have responded to the concerns of those at the operations. A one page summary is

available. Some teams have a mini-adoption guide. Adoption Team Leaders judge whether at operational level, consideration of the full Handbook would work. In most cases, people work with extracts and summaries.

- *"We have portions of the Handbook available to us. The steps we followed for MOSH are summarized in our presentation."*

- *"He did a great job and we used his tracking document."*

- *"Can you adjust these tools? Each team adjusts the questionnaire in practice."*

- *".......have never supported detailed steps – this is only necessary when there is only one way to do things. The Adoption Team Leaders have got to be allowed to exercise (their own) discretion. Going step by step is too slow and the teams must not become slaves to the process."*

- *"I don't carry the Handbook with me. I print out what I need. I don't show the Handbook to people at the demonstration mine."*

Few People Know the Details of the MOSH Leading Practice Adoption System

How to simplify the MOSH Handbook will be determined by what is working in the MOSH process. In the rollout of the MOSH adoption system there are people who are familiar with Handbook and the tools, and people who are not. In the interviews it became clear however that most people involved in the MOSH Leading Practice Adoption System were not familiar with the content of the Handbook and tools. They were unable to comment on specific steps in the process, templates and reference documents. Those in key positions in the Adoption Teams in the process were however fully conversant with the Handbook and tools. The individuals who wrote the Handbook and designed the tools, and who were also engaged in training the Adoption Teams were best able to describe, without handling the Handbook, what it contained, and explain the value of the tools and the importance of adhering to the steps.

Amongst those involved in the oversight and governance of the MOSH system - in COM executive structure, in the Task Force and in the MOSH Coordinating Committee - were individuals who had been involved in the design of the system and in a review of the Handbook. A minority of these individuals were still familiar with content of the Handbook and the tools. The majority of people at this level appear to have at least seen the Handbook and handled it physically.

Of the people involved in resourcing and supporting the MOSH process, the Adoption Team Leaders were most familiar with the MOSH Handbook and tools.

At the mine sites visited, there were a few managers who have gone through the Handbook to find alignment between the MOSH adoption system and company or mine site priorities. Most managers had relied on the Adoption Team managers to guide them through the process, and had not seen the original Handbook and tools. The tools that mine managers were most likely to identify were the interview templates and the DVD. Those involved in the COPA also received the brochures.

- *"Haven't seen it at all."*

- *"I haven't seen the Handbook, but the head of health and safety might have a copy. We have portions of the Handbook available to us."*

People involved with production work at mines, both at management and supervisor level were least likely to have seen and used the Handbook. The tool they are most likely to have seen is the DVD. Some workers said they had seen MOSH brochures. Most people at this level heard about the MOSH process at a training event from their supervisors. Where supervisors were involved in interviewing workers, they were able to talk about interview templates.

- *"I have not seen the MOSH Handbook and tools."*

- *"The shaft manager instructed us to implement the MOSH system" (referring to the entry examination)*

- *"There are pamphlets (in the mine) and the miners told us how MOSH works"*

MOSH Principles Are Upheld, But Process Is Not Strictly Followed

The underlying principles of MOSH, viz. applying leading practice to major health and safety risks, thorough appreciation of the technical and operational impacts of the leading practice, finding out what people think and belief about the hazard and the intended solution are upheld, but not necessarily as set out in the steps and templates contained in the Handbook.

- *"A shorter checklist based on the first checklist in the Handbook would be useful. We did this with....'s help. The 48 steps were reduced to 13 steps under 6 major headings."*

- *"The risk management process in the Handbook is not what mines use, the Canadian language is new / hard to understand. There is too much demand for everyone to follow the manual strictly. We tried to fit the processes into those which exist at the mines."*

- *"As required, the teams identify leading practice and the mines are adopting this leading practice by following the system, but there are shortcuts which are being taken. This is because the process is too slow and cumbersome. Handbook is extremely detailed and probably inflexible."*

- *"We have not applied the MOSH process elsewhere. Did not really think about the MOSH process, we do many things in the MOSH, without following it consciously. (We are) doing it without realising it". We also use the OSHAS 18000 change process not the MOSH one."*

- *"We interviewed team leaders and others to hear their views. We took these views into account. We based the interviews on the template in the Handbook. Section leaders and mine captains did the interviews and union members interpreted. We communicate in various ways."*

This is illustrated in Box 3 below.

BOX 3: THE MOSH PROCESS AND THE EXPERIENCE OF IMPLEMENTATION

Although all the MOSH implementation role-players respect the MOSH process, it is regarded as a complex process that is time-consuming to implement. The implementation milestone for the teams is, "*when will you have a post-demonstration workshop*." However it is the demonstration phase of the MOSH process that causes the Adoption Teams most difficulties. Actual timelines of implementation were assessed using available documentation, an example of which is provided in Figure 2. Doggedly following the prescribed process of source mine, demonstration mine and adoption mine(s) impedes progress. In one such case it was suggested that the source mine had in fact been "demonstrating" the leading practice for two years. In such a case there was no real rationale for demonstrating; rather the source mine experience should be fully documented and then shared widely with industry through COPAs.

- *"The MOSH timeline is too long. People get impatient with this."*
- *"It puts a break on the process having a demonstration mine."*

Concurrent with the need to condense the process of initiating and sharing leading practice is that the existing MOSH process can learn from the experience of implementation to date. The process of institutionalising practice is not fully appreciated in the most recent version of the MOSH process. The FOG Adoption Team estimates that it takes three years to embed a leading practice. The MOSH process may need revision to reflect an appreciation of how time consuming the embedding and institutionalisation of the leading practice in adoption mines will

---

The reasons cited for working with the essence of the MOSH adoption process and not the detail range from (i) the complexity of the process through to (ii) the need to adopt the process mine site

priorities, (iii) to incorporate the process in company strategy, and (iv) the practicalities of rollout such as whether people on the site were able to work with the Handbook, who was available to take the process forward, what specific difficulties were encountered, the quality of the relationship between worker and management on site, and the Adoption Teams had learnt from previous iterations of the process. Constant changes to the Handbook were also cited as a reason.

- *"It's too many steps and the challenge is to make it much simpler. Mining people are simple people – we don't need laborious procedures. Decide what we're going to do and we do it and measure our progress. We are adding too much complexity to a simple matter"*

- *"The Handbook says "put your system aside'' (and this is not what happens)"*

- *"The value case was probably not done by all mines. It depends on the particular mine and what is to be done"*

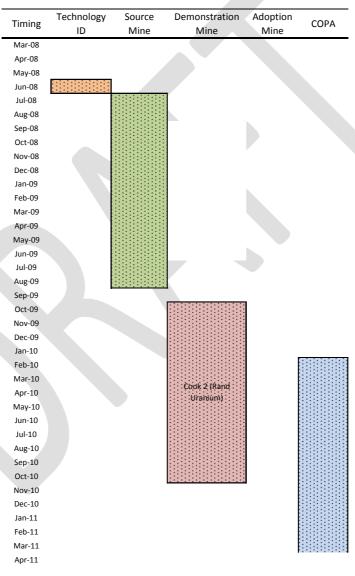**Leading Practice: Hearing Protection Devices**

Timing	Technology ID	Source Mine	Demonstration Mine	Adoption Mine	COPA
Mar-08					
Apr-08					
May-08					
Jun-08	▨				
Jul-08		▨			
Aug-08					
Sep-08					
Oct-08					
Nov-08					
Dec-08					
Jan-09					
Feb-09					
Mar-09					
Apr-09					
May-09					
Jun-09					
Jul-09					
Aug-09					
Sep-09					
Oct-09			▨		
Nov-09					
Dec-09					
Jan-10					
Feb-10					
Mar-10					
Apr-10			Cook 2 (Rand Uranium)		
May-10					
Jun-10					
Jul-10					
Aug-10					
Sep-10					
Oct-10					
Nov-10					▨
Dec-10					
Jan-11					
Feb-11					
Mar-11					
Apr-11					

Figure 2: MOSH Process Timeline Example

- *With reference to the Handbook: "Picking up on all changes is hard."*

- *A number of key individuals at Task Force, Sponsor, Adoption Team and company level suggested how the process could be improved.*

- *"We need a flow diagram on two pages. We need the key principles. Why? What? How? Most of the Handbook is reference material."*

- *"The management steps can be put in a nutshell. We did this and did not fixate on a piece of paper. (We have seen the Handbook)."*

- *"The Handbook should teach what to do, not how to do it. Then what is done should be monitored. The Adoption Team Leaders should be coaches."*

- *"It is possible to use other terms than mental models "getting understanding of how people think" or "perception survey".*

- *"I prefer visual communication, real experience and personal relationships. Don't send me a CD or a book, send me a person. We've got technical visits – use these."*

- *"All research necessary to support an adoption process can be done at the source mine, we don't have to keep repeating it."*

Adoption Systems Takes Too Long to Rollout

The system is regarded as taking too long because:

- Progress toward the 2013 milestones is too slow and increasingly people fear that the milestones will not be achieved,

- The system itself involves too many steps and this delays adoption,

- The amount of work required at the demonstration site has been underestimated and takes too long. Only once this work is considered done, can the leading practice be advocated as proven and ready for adoption.

- The work required at the demonstration mine involves a fresh look at the science of the technology and implementing environment. The Leading Practice needs to be customised to the implementing environment.

- Of the need to document every step.

In the words of those involved:

- *"The progress is has been slow. Faster turnaround is needed to meet agreed objectives (as per the milestones)."*

- *"The main issue is not at the source mine it is at the demonstration mine. People need to appreciate that the demonstration mine can also show what is not working."*

- *"It (MOSH) is about not reinventing the wheel, the Leading Practice is adopted but changes have to be made (at the adoption mine). Thinking is necessary, doing homework is necessary."*

- With reference to the adoption process: *"But there is a whole process / science around technology which is very important."*

- *"Buy-in for a project is always first. Choose a project that is going to work. It is essential that there is certainty for the first project so that you avoid losing credibility. Hilti took 10 years to develop. Most managers want to quick fix- there are no quick fix in this area."*

- *"In a mine, if all is not going well then reporting will not be a priority. There are also other ways to get things done."*

Be Clear About the Role of Leading Practice in Controlling Risk

Although the MOSH adoption system is grounded on risk management with leading practices being selected on the basis of risk assessment, the place of the leading practice in health and safety risk control strategy is not clearly articulated. This leads to concerns that (i) the wrong leading practices are being selected, (ii) leading practices can be seen a "silver bullet", (iii) leading practices are not

positioned properly in the suite of controls required to address a particular hazard and (iv) risk management principles are not being applied some sites where the leading practices are considered. For example, the focus on hearing protection devices and the fogger do not seem to be consistent with the hierarchy of controls, unless the full strategy of the source and adoptions mines is made known.

- *"What things are working together there? We are looking for a silver bullet, one thing. There is limited scope for these. Need to look at whole systems, where is the appetite?"*

- *"What do you need to have in place to manage dust, what are all the elements in your dust management strategy? How does it work?"*

- *"They need to also tackle issues of mine design and layout. For example falls of ground is not just because of safety netting. Need to look at more design level and layout."*

- *"We have a comprehensive noise reduction strategic and the Hilti is part of this (and will continue to be part of this, at about 30% of stoping)."*

<u>Mental Models Research Is Not Completely Effective</u>

The experience of the mine sites visited suggest that the people aspects of the MOSH adoption system fall short of what is needed in practice in South Africa. This gap is filled by the experience of people on site, particularly in companies that have already invested heavily in building caring, personal and purposeful working relationships among the members of mining crews, and the same between the workforce, and supervisors and managers. While the behavioural aspects of the MOSH system do not carry the adoption process on its own, understanding the fears and concerns of the workforce for specific leading practices has clearly improved the pace of adoption. There are accounts of successful mental modelling, leadership behavioural planning and behavioural communication planning as required by the Handbook. Decision-Partners also see irregular and informal application of these tools. At operational level interviews are undertaken and value is seen. At this level, concerns are expressed about scale of the process, the appropriateness of the process when other avenues to achieve the same are available, the necessity to conduct the process for every leading practice or at individual sites, and the use of jargon.

The findings of the evaluation team with respect to mental models are contained in Box 4.

BOX 4: MENTAL MODEL FINDINGS

- Implementers are uncomfortable with the term "mental model". They appreciate however the need to uncover beliefs and concerns, and to assess knowledge.

- Nobody on the MOSH implementation team felt really confident to conduct mental model interviews, despite training and support in this area.

- In practice, the interview process and the development of required plans is onerous because of the time, resources and skill required.

- Where formal interviews were conducted the protocol was not applied as designed. It was amended to take account of situation and needs at site level.

- The protocol is too generic, and the language is more abstract than that used day-to-day in the workplace.

- In a few cases the planning tools were fully utilised, but most often behavioural and communication plans were implemented following less formal consideration of the interview outcomes.

- Mental modelling, developing leadership behavioural plans and behavioural communication plans did not, on their own, achieve the level of involvement and engagement required for successful adoption of leading practice. Involvement and engagement also involves the following:

- o Mass meetings were important to inform the whole workforce of the leading practice of interest and gauge initial sentiment.

- o Engaging key deciders in building the business and risk case for implementation of the leading practice is more elaborate than the prescribed process.

- o Obtaining buy-in by exposing users to the leading practice and allowing them to make up their own minds

- o Being prepared to adapt the technology to local conditions by working with the users and taking the issues raised by them seriously.

- o Creating culture of caring, strong relationships and shared understanding of a company's

---

Feedback from interviewees supports these findings:

- *"Behavioural safety is focussed on bring about observable safe acts. The mental model approach goes deeper by looking at how managers influence what people do and how they, the managers, do this."*

- *"Workers will tell us things when we are open. Such as we have no entertainment, no TV or our living conditions are difficult. We can be really humbled by workers' stories when we take time to listen."*

- *"Some things that are used in Canada and Australia for example lead to other problems when they are implemented here. In countries such as these workers are so empowered to engage management."*

- *"I would say buy-in from underground teams is critical. This was made clear to me in the failure in ….. There is sometimes a fine line between consultation and buy-in. A pilot shouldn't be in one area but rather in a shaft or across a level because this is a better platform to rollout from. I don't*

have recommendations to the MOSH process other than don't rush it and don't force feed. …. used the templates for mental model interviews. …… didn't use the templates. We followed the steps but we did not use the templates. Actually we used a mass meeting to kick start the whole process."

- *"The mental model interviews worked very well the first time and yielded nothing new the next time. Can an industry-wide mental model for the source mine, demo mines etc be done?"*

- *"Miners do not know how to interview and analyse interviewers. It is true that these people were not trained to interview and the …. team has now been trained."*

- *"The interviewees tend to communicate, think and understand risk in technical terms. The technique is unfamiliar to people. People find it hard to do and are not comfortable with conducting interviews."*

- *"Our limitation is that we don't have professional people who can conduct the mental model interviews. Sometimes it is a problem for people to probe too deeply because this can also cause problems such as personal trauma and abuse."*

- *With reference to a specific Adoption Team: Mr X's "team has a good example of completed templates for leadership behaviour and a communication action plan."*

- *Referring to the behaviour related tools: "The language used in the MOSH process is complicated. The principles and underlying concepts are sound but we haven't put it into everyday language. We need to find away to translate this in a meaningful manner to get the adoption process to have real impact. People don't understand jargon. "*

At Mines, the Source, Demonstration, & Adoption Labels Do Not Matter

Not a single one of the mine sites visited were involved in only one leading practice. A number were source, demonstration and adoption mines at the same time. The labels source, demonstration and adoption mines did not have particular meaning at these mines. In many cases details related to documenting a source leading practice were hazy.

The Portal Is Used Occasionally

Generally the portal was not used by many people. Many did not know about it and those that did outside of the Adoption Team Leaders used the site once or twice and then not again. Users found the portal useful but slow and unfriendly. This prevents the portal from being the repository for resource material and work-in-progress reports as envisaged. The portal was roundly criticised as being too slow, difficult to navigate and work with, cumbersome and out of date.

Some Adoption Team Leaders had made CDs for the use mine-based Adoption Teams. These appear to be used in place of the portal.

- *"The portal system is extremely slow. (This is because it runs on a) Lotus system and this should be changed."*

- *"The website is difficult to access – a password is needed. I used it a few times, and not again since then."*

- *"The portal site doesn't function that well. I haven't used the site for 6 months. Two months ago we heard it was to be improved. There is no information on the number of hits on the MOSH website."*

- *"The portal needs to get out there. It is not advocated enough."*

- *"There is nothing to hide. For research it should be open."*

- *"Anything with a password is a problem. Why is the website password protected?"*

- *"A password should not be needed for the web. I only used the web twice. "*

- *"The use of the MOSH website is very low."*

The DVD is Used in Specific Situations

The DVD is considered to be good and is used, albeit in a limited way. Interviewees who participated in the COPAs) saw the DVD at COPA meetings. They explained that the DVD had become dated and that was the reason why it was not widely used at mine sites. At one of the mine sites visited the managers interviewed relayed that DVD was played on monitors at the crush (entrance to the underground operation) and was also used in training. In the latter setting the DVD was interrupted to explain company policy, strategy and performance, which is better than the industry norm. One company had made its own DVD on the entry examination leading practice.

- *"The MOSH DVD is good"*

- *"The MOSH DVD is user friendly"*

- *"The DVD is dated most of the individuals have left. We have used the DVD at exhibitions."*

- *"Did use the DVD, but interrupted it to tell the (Company) story."*

Brochures Are Noticed

Only one example was cited of the brochures (and comic books) being used to facilitate rollout. However people did receive them, particularly at COPA meetings and some workers had encountered them on their mine. While it is apparent that the brochures are used to popularise the MOSH adoption system and provide information on leading practices, the distribution and impact of the brochures is not evaluated.

- *"We used the pamphlets and the comic books were quite useful."*

- *"Brochures are distributed – there is no follow up of impact. At a briefing meeting I noticed the brochure was left on the table."*

- *"We produced another brochure for Mine Safe."*

3.3.3 CONCLUSIONS AND RECOMMENDATIONS

With respect resourcing, capacity, and tools, the following specific issues are worth noting:

- The templates and tools MOSH Handbooks are applied, but with adjustments to take account of the circumstances encountered at operational sites.

- The Adoptions Team Leaders play a crucial role, translating the Handbook and guiding operations through the process.

- Management at mine sites have a crucial role in aligning MOSH with existing policy, OHS strategy and initiatives. This appears to the key of for successful adoption and the longevity of the intervention.

- Dependence on the expertise of the Adoption Team Leaders will grow with each new initiative unless the tools are distilled into a form which people at mine sites can grasp and work with.

- The people aspects of the MOSH process make a difference, but do not substitute for the investment needed to bring about and sustain the deep level of culture change needed at mining operations.

- Tools such as the DVD and brochures are not fully utilized and better use can be made of them.

- The portal is not widely used.

- The Handbook and guidelines do not acknowledge that different companies and sites are at different stages in building workplace relationships and respectful partnerships. In practice, the people related aspects of adoption could involve MORE or LESS than described in the Handbook.

- It is important for the implementation team as a whole to consider how important it is to share and communicate one integrated view of "what is MOSH".

Recommendations, with respect to processes:

- To shorten the process, demonstration of the leading practice may be optional in some cases, where it is really not necessary to re-test it at a demonstration mine.

- The MOSH process may need revision to reflect an appreciation of how time consuming the embedding and institutionalisation of a leading practice in adoption mines will be.

- The principles of the MOSH process should be clarified to ensure that where alternative ways of achieving the same outcomes are possible, the alternatives can be checked for alignment with the underlying principles.

- Process, quality and outcome indicators should be available for the simplified process.

- The environments in certain mining companies make for easier adoption, and these characteristics should be clarified for others.

- Other ways of obtaining information about beliefs, knowledge and concerns are considered drawing on practice in public health, where the impact of health beliefs on practice has long been acknowledged. This could mean:
  - Conducting an industry-wide survey to uncover the information required and designing generic communication and other plans on this basis.
  - Allowing the adoption team managers and site level adoption teams to employ this information in site appropriate ways.

- Leading practices should feature in the decision-making processes of mining companies such as strategic planning and budgeting.

Recommendations, with respect to tools:

- The Handbook should be simplified so that the requirements and steps of the project are clear.

- Distinction should be made between resource or reference material and a user friendly verison of the Handbook.

- The amendments to the Handbook that have been made in practice by Adoption Team Leaders should provide the starting point for the simplification process.

- The place of tools such as the DVD, brochures and portal should be clarified to optimise their usefulness.

General recommendations, with respect to structure, capacity and roles:

- It is not clear whether each leading practice requires a COPA of its own, how COPAs address the needs of members at different stages of adoption, and when COPAs can be dissolved. The COPAs are working, and this experience should be reflected in the MOSH Adoption System. COPAs may have finite lives and the learnings from COPA should be captured and transferred.

- The Learning Hub should consider how to make a secondment to MOSH attractive for experienced individuals and for companies. What would help high calibre individuals stay? What

could make for a win-win arrangement? With respect to role differentiation it is the role of the Head of Learning Hub to drive the process of securing secondments (reference Handbook Section 2.1).

- If this strategy as a mechanism of staffing the MOSH structures is really failing, then the issue needs to be elevated to the strategy level of the Project. It may also be helpful for MOSH to consider having a more differentiated approach to staffing the adoption teams that includes secondments, part time release arrangements, job share agreements etc. There will not necessarily be one answer to the challenge of securing the right staff. Embracing a more flexible approach is perhaps more helpful.

- With respect to roles and responsibilities Sections 2.1, 2.2, 2.3, 2.4, 13.1, 13.2 and 13.3 of the Handbook apply. There is a detailed description of the roles of the Learning Hub Secretariat, The Adoption Team Leaders, The Adoption Specialists, Sponsors and The MOSH Task Force. Much of this detail is still very relevant and it will be very helpful for those involved with implementation to actively apply this. In particular the role of the MOSH Task Force, the Adoption Sponsors and the role of the Adoption Specialists can be reviewed on the basis of the useful descriptions in the Handbook.

- With respect to the MOSH Task Force and MOSH Advisory Group:
  - o The functions of the MOSH Task Force as envisaged in the MOSH Adoption Handbook are essential if MOSH is to function effectively. It is not clear to the evaluation team if it is the intention of the MOSH Learning Hub to transfer these functions to the MOSH Advisory Group? The evaluation team recommends rather that the MOSH Task Force undergo urgent review. That the functions of the Task Force such as an annual workshop to discuss MOSH strategy are instituted and managed by the Head of the Learning Hub. The stated role of the Task Team requires it to play an oversight role of adoption activity and this must be more rigorously respected through the appropriate presentation of reports and other related activities. The Head of Learning Hub, as it pertains to the MOSH Leading Practice Adoption System, must set the agenda for the MOSH Task Force. The present Terms of Reference are an adequate framework for such a review.

  - o The viability of the MOSH Task Force carrying other industry wide initiatives such as the Centre of Excellence and Culture Transformation should be reconsidered in the light of the MOSH Adoption project needing to scale up. It is the opinion of evaluation team that the MOSH Task Force should in the light of delivery demands and the imminence of the 2013 milestones make the delivery of the MOSH Adoption System their first priority.

  - o The MOSH Advisory Group should not replace the role of the MOSH Task Force. It is not advisable to have two entities playing an oversight role. The decision to convene an Advisory Group should be revisited. The MHSC is the appropriate tripartite forum in which to engage with labour and government. It is also the forum at which the tripartite partners themselves wish to be engaged.

- With respect to the MOSH Co-ordinating Committee:
  - o The MOSH Co-ordinating Committee is an important structure that provides accountability of the Learning Hub to the COM. This committee should support the process of decision-making at the appropriate level of the MOSH Project by agreeing what are implementation issues for the Learning Hub and/or Adoption Teams and what needs resolution at the level of governance through the MOSH Task Force or MHSC.

- With respect to the Learning Hub:
  - o The MOSH Adoption Teams to date have not been fully staffed as envisaged in the MOSH Handbook. Experience shows that high-calibre candidates must lead the Adoption Teams. MOSH trainees and MOSH Adoption Specialists (to date unfilled posts in the

Team) can usefully complete tasks presently inadequately met by the Adoption Teams. One of these functions is documentation that presently happens inconsistently within teams and the other is conducting mental model interviews and providing the link between operational level and central reporting.

o MOSH trainees, Adoption specialists and/or managers from operational sites are positioned to play a more flexible role to support MOSH reach its targets. For example they may be able to play either a more technical or process (people centred) role as necessary. The recruitment of these individuals should reflect the role they will be asked to meet. They should perhaps not be considered as a homogenous group but rather recruited to address specific needs that may differ across leading practice areas. This group of individuals can address the gaps and queries coming from the operational level. This may include sharing learnings, strengthening process and improving MOSH communication at mine sites. MOSH trainees should also support the administrative needs of the Adoption Teams including setting up COPA meetings and data collection.

o All contracts in the Learning Hub must include deliverables that are reviewed regularly. This will create better accountability.

o The Head of the Learning Hub should lead the process of staffing the Learning Hub as stated in the MOSH Handbook. Alternatives to full secondments should be explored and attractive packages secured (This could include international exposure, site visits, networking and publishing opportunities) that make time in the Learning Hub worthwhile for very experienced staff and for companies seconding staff. Where this strategy seriously falters it should be elevated to the level of governance.

o The M&E and behavioural specialists should establish small technical groups to support their work. The purpose of these technical teams would be to primarily provide advice, the opportunity to think through the challenges in these areas and to identify a range of possible approaches. Where appropriate members of the technical team can support the documentation of work as needed. The additional capacity will help MOSH respond more flexibly to the different demands arising from the operational level by introducing more open thinking for both approaches to behaviour change and monitoring and reporting as well as providing consistency at the centre.

o By tightening decision-making and roles and responsibilities it is expected that the role of the MOSH Sponsor will reflect that described in the Handbook.

o A flexible technical assistance fund may support the Learning Hub to work more efficiently. For example, the preparation of documentation could be given as a short-term assignment to a consultant/s, depending on the strength of the Adoption Specialists and trainees.

o The capacity for effective communication and stakeholder engagement and management are very inadequate in the Learning Hub. The Learning Hub should take immediate action to address this gap. The Learning Hub should consider using experienced communication specialist/s from industry and/or consider reallocating existing posts in the Learning Hub to specifically address communication and stakeholder management. User-friendly versions of print materials and short audio visual clips of progress and learnings are also necessary. A budget to produce simplified MOSH print and electronic materials and additional short term and ad hoc technical assistance such as use of communication facilitators to meet specific needs will build capacity. Stakeholder engagement such as the management of external stakeholders such as government, labour and representatives of industry is an important part of MOSH activity. The Head of the Learning Hub must play a leading role in the engagement of key stakeholder groups eg. SACMA, AMM, MHSC, MHSI and labour.

o   The review and simplification of the MOSH tools should be a well-managed process that includes consultation and sign off. It is proposed that a group of experienced individuals from across the MOSH implementation team be identified as individuals asked to comment on drafts of simplified tools. The Head of the Learning Hub should sign off on all completed products. Again tightening decision-making and accountability will ensure that the Learning Hub gets the deliverables it needs.

3.4   MINE SITE IMPLEMENTATION

The commentary below is drawn from a series of visits to source, demonstration and adoption mines over the course of two months. The evaluation team observed that MOSH documentation largely refers to the implementation or adoption process, but not the actual outcomes of the process at the source mine. A significant opportunity to pass on learnings is being lost through inadequate documentation of source mine experience with the leading practice. This is clear from the fact that comments at demonstration and adoption mines highlight the same issues as are evidenced in some of the positive and negative comments reflected below, all from source mines.

It is also important that failures are documented, as these can be used to guide the adoption process. If source mine issues are well documented, then the demonstration and adoption mines can better understand from the outset what the implementation issues are, and manage these appropriately.

With respect to the positive effect that implementation of what was to become a leading practice could have, source mine interviewees shared the following perspectives.

- *"… has been introduced …. and we are happy with it. We are satisfied with it. That is the change we've seen." (Underground work team)*

- *"The reason why the mine introduced HILTI was because they were complaining that SMOG [a fanakalo term denoting pneumatic drill] machine was noisy and affected the workers' ears. So it was clear that HILTI was the best machine because it was less noisy." (Underground work team)*

- *"The mine has undertaken to have no new silicosis cases by the year 2013 ….. the Fogger system is superior to the filter bag system." (Shift-boss)*

- *"Let me add, in the previous years [before the implementation ……] you'd find that in a month; maybe 10-18 people were exposed …..but right now you find that it's only one or two or three people exposed …. So it shows that there is a [change]. Although there are challenges but there is a bit of change." (Underground work team)*

- *"Before [implementation], we had a ………….. system that was not very effective. We have graphs showing the effect of the [new] system. As can be seen, it is, in general, effective …………." (Shift-boss and ventilation officer).*

In certain cases at the source mines, legitimate concerns were interpreted as resistance to new technology:

- *"We encountered resistance from the crews who were afraid …………. When the crew saw the … people drilling without [harm], they soon overcame their fears." (Miner and shift-boss)*

- *"There was resistance, because some of us never believed ……… Up until they kept on explaining that this was just water mixed with chemicals, it was not an explosive [smog]. So that thing was harmless on our lives, it was beneficial." (Worker)*

It was interesting to find out that at the HILTI drill source mine, in response to the dangers associated with the HILTI drill operation, workers made a plan by developing their own collaring device through the hosepipe which protected them from getting hand injuries from the HILTI drill. In this instance, making a plan (*planisa*) was a safe working practice based on workers' tacit knowledge such that the trainer of Simunye team project said that he would check the HILTI drill manual if it made mention of

such a practice and if not, he would suggest that it should be recorded on the HILTI drill manual because it was a safe act on the side of workers. This learning was not passed on to the demonstration mine.

It was evident at source mines that union support is a critical factor, although not sufficient in itself, to assist in acceptance of changes.

- *"The union supported us because some of them were part of the people who were talking to the workers about risk assessment." (Underground work team*

- *"The NUM was involved to the extent that management communicated with them." (Shift-boss*

- *"The other thing as I have said is that when you upgrade, even the money changes. When we moved [technologies] we were supposed to get salary increases. They should stop saying the two …. are similar … They are different, they are not the same. They do the same job but they are not the same." (Team worker)*

It was clear at source mines that perceptions of what constituted training differ widely across levels.

- *"Training was supposed to happen. They said that … was the same….but they are not the same. They said the principles were the same, but the principles do not imply training. A person has to be trained because if there is an accident, a person has to testify that he received training. Excuse me! If I could just deviate from what we are talking about now; do you know a winch? … a person has to be taught how to work with a winch, thereafter he would be assigned to work with a winch. But with this machine we just learnt as we went because we had experience in operating machinery. We never had training. I think it would be better if there was a school mine…. If you hold …..like this the machine would injure you …... You'll just hear a person crying." (Underground work team)*

- *"No we haven't received training. We were instructed as we were already working … The shift-boss and the mine captain came with a certain coloured guy … They brought the [technology] – ………….just told us that here is a supplier cable, and where the extension cable goes. That is what we were only told. We were never trained." (Underground work tem)*

- *"We had a day in the training centre where the machine was introduced to us. We could ask questions to the …….. people and there were mine instructors as well answering questions. The best training was at the stope face, where the …. instructors showed us……..and they then assisted our crews with resolving any problems they encountered. They were with us for two weeks on a permanent basis." (Miner)*

The role of visible and caring leadership in effecting change at source mines was patent, including how work teams must deal with production pressures.

- *"I do not know the CEO of the company, but, as he always emphasizes health and safety in pamphlets and notices, the introduction of the machine must have come from him."*

- *"Health and safety … the main problem is intimidation, threats – I am talking with regards to supervision … A worker becomes weak when he is supposed to apply his rights. A supervisor would tell you; you now know the law, so I am not going to give you a day off. You are not going to get leave. I am not going to sign for it. It's a lack of knowledge and thinking that the employer is above my life. It's like the employer is in charge of my life and not me personally. That is the situation. There are workers who still believe that if I do not appease my employer – even if I see that ………… And MOSH says I should not go ahead ……….. Then my boss would come and say; ………. let's just go for production, we will see it later."(Underground work team)*

- *"Let me say it is – here ... safety is driven by Mr A and Mr B and if we didn't have these two people we'd be dead. Yes, he is right, since that white guy [Mr B] and Mr A became in charge things went well." (Underground work team)*

- *"You know what is happening; they do talk about it at the mass meeting that this is what needs to happen, but when it comes to the workplace they change their minds. They [run] after the*

workers. Co-operation right from the level of the mine overseer downwards. If they could cooperate with each other we would work peacefully with each other. Even if a worker comes to report and it cannot be fixed at that point in time, I should be able to say: "thank you, you did a good thing, I realised that this thing could be dangerous." (Underground work team)

- *"Our mine captains are supportive, they are trying. ………. The shift-bosses are struggling just like us. ……… We are in the same situation. They know about everything we talk about here." (Underground work team)*

- *"We do not get support. For instance, maybe we have [a panel] to blast and you find that we need three [gang blocks] – he [supervisor] would just say just go ahead and blast, maak'n plan. That's the truth; maak'n plan, maak 'n plan." (Underground work team).*

As will be seen in the following section, these issues were also evident at demonstration and adoption mines.

3.4.1 SUCCESSES

This section reflects results from demonstration and adoption mines only.

3.4.1.1   ACCEPTANCE OF THE MOSH LEADING PRACTICES

One of the key findings of the MOSH evaluation study is that workers, supervisors and mine management accepted and embraced the MOSH leading practices. This highlights the "ownership of the leading practices" emphasised by the MOSH process – which is regarded as one of the key factors for effective implementation and management of health and safety initiatives. The following is what the underground work teams had to say about the adoption of the leading practices:

- *"Yes. This system is good. We are using MOSH [leading practice]. ….. But right now we all go and help each other ……".*

- *"I can also put it that way that this machine is good, because it does not make noise [and it does not vibrate a lot."]*

The production supervisors (miners and shift-bosses) shared the same view:

- *"Up to now it has been a positive experience. Since the adoption of this leading practice we have less accidents, not just [in the leading practice area] but a reduction in other types of accidents as well. We have developed a better understanding between the workers and supervision, and they realize that we are serious about preventing accidents and looking after the workers' well being."*

- *"Previously, it was the miner, team leader and an assistant carrying out the early examination and making safe. Now, the whole team is involved – each member of the team makes certain that the area in which he works, is made safe."*

- *"HILTI machines drill faster and have lower noise levels and there is less vibration on the machines compared to pneumatic jack hammers."*

The underground work teams in the mine sites appreciated the Chamber of Mine's MOSH initiative and believed that the adoption and implementation of the MOSH leading practices were crucial to achieving to improving safety performance in the South African mining industry.

- *"MOSH [leading practice] is good given the incidents that happen in the mine. … Although there could be problems because anything can happen working underground, but it should be clear that safety was prioritised at all times.*

- *"Okay, I think MOSH has been helpful since it was introduced. ….So in that way we couldn't see if there were hazardous situations. So at the moment as we are using MOSH, at least we now know that at such and such an area there is danger."*

The miners and shift-bosses shared the same sentiment that the MOSH leading practices were crucial to achieving the mining industry's 2013 health and safety milestones:

- *"The main reason is to deal with …. problems before they develop into accidents. It [the leading practice] is also to ensure the involvement of the whole team ………. We try to establish a culture that ensures that we look at our own safety as well of the safety of our fellow workers."*

3.4.1.2 IMPROVED WORKPLACE HEALTH AND SAFETY

The MOSH leading practices were identified as leading practices because of their significant contribution to the improvement of health and safety in the underground mining workplace. Workers at one demonstration mine pointed out that they had already seen the value of using the HILTI drill in that it has protected them from hearing loss compared to using the pneumatic drill which is noisier than the HILTI drill. The proven results of the MOSH leading practices to improving workplace health and safety have the potential to facilitate interaction between the source, demonstration and adoption mines – which is critically important to the wider adoption of the MOSH leading practices. For example, one miner and a shift-boss supervisor at the demonstration mine pointed out that their senior mine management sent them to the source mine to learn about the HILTI drill:

- *"The CEO and mine manager gave us the opportunity to watch the HILTI machine in operation at another mine and to try out the machine at our mine."*

A shaft manager in a demonstration mine pointed out that the mine visited the source mine prior to implementing the entry examination and making safe. This therefore shows that there is interaction and sharing of knowledge and experiences between the mine. However, there is huge potential to improve the documentation of actual results and outcomes, rather than only processes to encourage smooth implementation.

At the time of this evaluation study, the entry examination and making safe leading practice had been the most widely implemented. The successful implementation of this MOSH leading practice has been attributed to the energy and leadership of the MOSH FoG Team. However, observations made underground by the CSMI evaluation team revealed that despite the fact that the implementation of the entry examination and making safe leading practice was time consuming, it was relatively easier and less complicated to implement it in the workplace compared to the other MOSH leading practices. Down the mine, the implementation of the entry examination and making safe is to a large extent driven by an underground work team whereas the implementation of other leading practices such as the HILTI drill and fogger involves a number of people including technicians. When the HILTI drill and fogger break, workers do not have the capacity to fix the machines but have to wait for the technicians or suppliers to address the mechanical breakdowns.

The following is what workers and production supervisors had to say about the impact that the implementation of the MOSH leading practices has made on workplace health and safety:

- *"Yes, accidents have gone down …. right now we do the searching together and we discover things together…. But everyone can see where problems are and how could they be fixed. At the end we go back and discuss it. So it helps a lot. Accidents have gone down."*

- *"I think that since it [leading practice] was introduced accidents were happening, but the rate has decreased because each and everything we do is discussed and we reach an agreement ... everyone shares their opinion if they see problems. But previously the team leader was the only person in charge and the workers were unable to say anything if they see a problem. But these days each and every person has a right to give their views when they see problems. They can then sit down and discuss that concern and see how it can be resolved."*

- *"The mine decided on the use of the HILTI machine to reduce noise levels and in doing so, to prevent and minimize noise induced hearing loss. The noise level per HILTI machine is 102 dB (A).*

It has an impact on the operators' health and well being as it is less noisy. Because the HILTI machine drills faster, there is a saving of time used for drilling the panels."

3.4.2 CHALLENGES

3.4.2.1 WORKERS' FEARS AND SECURING WORKERS' BUY-IN

As outlined in the MOSH Handbook, MOSH is meant to be an inclusive process. Employee engagement and securing workers' buy-in is one of the best OHS practices in workplace health and safety.[9] The MOSH system recognises the importance of involving workers in the implementation of the identified leading practices. As described in the MOSH Handbook, the MOSH process seeks to secure workers' buy-in through mental models. As noted earlier in this report, mental models are key to ensuring that the MOSH process is "people-centred" aimed at gathering data on people's knowledge, beliefs and attitudes which inform their decisions or reactions towards a particular change process. In the mine sites visited, workers did not know of the concept of mental models and did not appear to have been involved in such a process. However, one shaft manager at the demonstration mine mentioned that the mine conducted surveys and involved workers and supervisors when the mine introduced the MOSH system of entry examination and making safe.

It transpired from the focus group discussions with the production crews and supervisors that the mines visited had to deal with the workers' fears towards the implementation of the identified MOSH leading practices. Compounding workers' fears was the lack of knowledge on the identified leading practices.

The role of the trade unions was acknowledged as having helped the mines a great deal to allay the workers' fears and secure their buy-in in the MOSH project:

- *"As there was great resistance by the crews to adopt the HILTI machine, the unions were also involved in negotiating with the crews." (Shift-boss and miner).*

- *"Although we were not very supportive at the introduction stage of the practice, as it affected our production rate, we can see the benefits now: it gives a clear message to the work force that we care for their safety. The unions and associations are supportive." (Shift-boss and miner)*

- *"Unions are very important to this [MOSH] process because initially they [union] didn't want members to accept accountability ….. It took time for it to be accepted that the new approach to [the leading practice] gives workers a voice." (Shaft Manager).*

However, the analysis of data revealed that what the mine referred to as resistance from the workers at the initial stages of the implementation of the identified MOSH leading practices was not resistance *per se* but justifiable concerns from the workers.

It could be argued that the workers were not fully or properly engaged by mine management and trade unions. Further, it is important to note that trade union involvement does not mean worker involvement *per se*. Securing the cooperation of the trade union does not mean that the mine has secured the buy-in from the workers. Both management and trade unions must not merely announce workplace change programmes but ought to fully engage employees and address the concerns, fears and questions raised by workers regarding the design and implementation of health and safety initiatives. Workers indicated at one mine that they were not involved but merely informed that they had to switch to a new (MOSH) system. Similarly, at another mine, workers pointed out that out that they were just told that they had to switch from one technology to another without detailed explanation. As one team worker commented:

---

[9] Quinlan, M. (1995). *Achieving Efficiency and Accountability in Occupational Health and Safety and Workplace Freedom.* Occasional Paper 102, School of Industrial and Organisational Behaviour, University of New South Wales. See also Walters, D., Nichols, T., Connor, J., Tasiran, A. and Cam, S. (2005). *The Role and Effectiveness of Safety Representatives in Influencing Workplace Health and Safety*. Norwich: HSE.

- *"We were told how it worked and what it does … It was underground and we were told how it worked."*

Workers have nonetheless embraced the introduction of, for example, the HILTI drill. It was found that at the HILTI drill demonstration mine, production crews on the HILTI drill were incentivised:

- *"The drilling crews on HILTI machines also get extra money." (Shift-boss and miner).*

Mine management pointed out that the mine had not encountered resistance from the production crews on the HILTI drill and that the workers have demonstrated ownership in the implementation of the HILTI drill at the rock-face. It can be argued therefore that the demonstration mine dealt with the workers' concerns much better than the source mine in addressing the workers' concerns regarding the use of the HILTI drill. However, it is important to note that the demonstration mine implemented the HILTI drill on a voluntary and piecemeal fashion. Workers were not forced to use the HILTI drill and the mine had no intentions of rolling out the HILTI drill but was considering other means of silencing the equipment. At the source mine, however, the HILTI drill was the only option as the mine found it no longer viable to use the pneumatic drill because the compressed air could not reach the working faces. The experiences of the HILTI drill source and demonstration mines therefore shows that the MOSH process need to take into consideration the operational contexts and complexities of each mine. This is critically important to the effective adoption of the identified MOSH leading practices.

3.4.2.2   INFORMAL RATHER THAN FORMAL TRAINING

Across the source, demonstration and adoption mines visited, the workers had mixed views in that some indicated that they were not provided with training and others indicated that training was provided. As outlined in the MOSH Handbook, the MOSH process entails worker training if the leading practices are to be effectively implemented and produce the desired outcome in the underground workplace. Worker OHS training is crucial to effective worker participation in workplace health and safety. In the mine studied, where the training of workers was provided, it was informal or on-the-job type of training rather than formal training. In the mines visited on-the-job training relating to the MOSH leading practices was provided. The mines also carried out a number of demonstration, visits and follow-ups underground. Contrary to the supervisors and management's views, underground workers did not classify on-the-job training as "training" in that it was not certificated or formalised. This finding was a cause for concern for workers far as their role in the implementation of the MOSH leading practices was concerned. They felt that this management practice did not formally recognise their knowledge and skill acquired from operating the identified MOSH leading practices and was detrimental to their mining careers in that it dented their prospects of being employed in other workplaces:

- *"The authorities here in the mine say everyone must do the work they've trained for. So we also wanted to go and get training on how to use this machine and get certificates. Because it could happen that we go and work somewhere else where they use this machine. But you get chances of being employed when you have [documents]. So we do need training on how to use this machine. I [another worker making a comment] think he has said it all, because you could go and work somewhere else and when you produce your qualifications then they can see that you are important, you know how to operate the machine. So if you only have the qualifications for the older machine they would never know that you know how to operate the new machine." (Underground work team)*

Another underground work team at an adoption mine shared the same view that formal worker training should have been provided. When asked how they implemented the Leading Practice having not received formal training, the one worker remarked as follows:

- *"We train ourselves …... I talk to my workmate." (Team worker/health and safety rep).*

This remark suggests that workers trained themselves informally. However, the Assistant OHS Officer who had accompanied the CSMI researchers underground, disputed workers' remarks during the

focus group discussion that workers underwent competent B training on hazard identification. He went on to say demonstrations were also conducted in the underground workplace. One team worker however made the following comment:

- *"Demonstration for one day! You can't call that [formal] training."*

Although it could be argued that the formalisation of worker training should have been addressed at the demonstration mine, it does not appear that the source mines visited were aware that lack of formal recognition of on-the-job training was a great concern for underground workers. Had the source mines as well as the MOSH Project Teams realised the importance of formalising the on-the-job training, the demonstration and adoption mines would have probably formalised on-the-job training provided to workers. The finding that the mine sites visited do not seem to be aware that the formalisation of on-the-job training is worrisome for workers indicates that the mines did not fully engage their employees to find out what really their concerns were towards the implementation of the identified health and safety leading practices.

Moreover, it is also not valid for mines not to formally recognise the training provided to workers during the implementation of the new technology. The current underground mining workforce is more literate and educated than was the case historically. They do not take the implementation of OHS management systems at face value. They are therefore active reactors to the implementation of health and safety initiative. The MOSH Leading Practice Teams and the mines ought to realise this if the MOSH leading practices are to be successfully adopted across the mining industry. The formalisation of worker training is also crucial to securing workers' buy-in and ensuring ownership of health and safety initiatives at the point of production.

Contrary to the workers' remarks, production supervisors and mine managers broadly concurred that underground work teams and mine supervisors were provided with training related to the implementation of the MOSH leading practices:

- *"All the crews using the [leading practice] in our shaft are closely supervised….. In our M/O [Mine Overseer] section there are eight crews using the [leading practice]. All these crews have been trained in our working place for a day and then move to their own working places … We were trained on-the-job." (Shift-boss and miner).*

- *"The whole team was taken to the training centre and instructed about the new method of early examination and making safe. I [shift-boss] was part of the team that went to the training centre for a whole day. We were addressed by the manager, and after that by the safety officer, who showed us accident statistics and how the new system would improve the statistics." (Shift-boss and the miner)*

- *"I [miner] spent one day at the Training Centre where the method was explained to us. ……….. All shift bosses … were called at a meeting where the Shaft Manager instructed us to implement the MOSH System. I [shift-boss] understood from him [what it entails]…..." (Miner and shift-boss)*

A shaft manager at a demonstration mine confirmed workers' and supervisors' remarks that workers were trained (though it was not clear whether it was formal or informal):

- *"[Production] Crews were taken on surface for a day to start the process of training ………. This training starts with a presentation. Crews then work with the new process underground. There also posters in the waiting areas that explain the new [MOSH] procedure. The posters are in English, seTswana and seSotho."*

3.4.2.3 PRODUCTION PRESSURES AND SHORTCUTS

Although production workers, supervisors and management indicated that the adoption of MOSH leading practices has improved workplace safety to a certain extent, production pressures tended to interfere with the "safe production" mindset. This is supported by other research [6]. For instance, at one adoption mine, underground workers indicated that though they hailed the new system (MOSH), production pressure from production supervisors (especially mine overseers) was a threat to

effective implementation and the right of the worker to refuse unsafe work. The workers broadly concurred that as much as they ensured leading practice implementation, production supervisors were preoccupied with production – about meeting production targets. As one worker commented:

- *"The miner is scared of not getting production."*

One of the members of the CSMI's MOSH evaluation team was told by a mine overseer to hurry up his focus group discussion with his production crew, for reasons of pressure to supply product. This was a finding in itself in that it highlighted that production pressures pose a serious threat to effective implementation of the MOSH leading practices and produce a host of unintended consequences.

Similarly, workers at another demonstration mine pointed out that production pressure was a cause for concern:

- *"To add on what he said; we get instructions from the authorities. And if you are going to apply MOSH as stipulated, they would tell you that you are wasting time. We are not going to produce more. We want production." (Underground work team)*

The work team at a demonstration mine complained about unacknowledged effects of the implementation of a particular leading practice, where extra equipment was required, but unavailable. The team leader complained that the shortage of equipment caused them to knock-off late:

- *"The only problem we have with him is when he wants to reduce people and he says I must work with two people …. A person who uses [existing technology] can be able to do that … So I told him that it would be possible for me [do that] with three … I would be able to knock off at the same time with other people. But if I have to do [that] with two …. then I won't be able to finish on time."*

Although the team leader did not mention the repercussions of working long hours on worker health and safety, research has revealed that long working hours increases the vulnerability of workers to fatigue and accidents.

Production bottlenecks such as equipment failures and poor maintenance of equipment were also mentioned as contributory factors to production pressures which ultimately forced workers to engage in unsafe working practices such as taking shortcuts, with potentially serious repercussions for worker health and safety in the event of injury or accident.[10]

- *"That is the major thing, lack of resources/tools – a person is now under pressure from the team leader who is also being put under pressure by the miner and the shift boss. The shift boss is also pressurized by management ……. So there is nothing you can do, you have to use what you have. Planisa creates accidents because you are using sub-standard methods." (Underground work team)*

At the HILTI drill demonstration mine, workers used a manufactured collaring device which they workers referred to as "condom" because of the shape of its make.

3.4.2.4 MANAGEMENT COMMITMENT AND LEADERSHIP NOT VISIBLE ENOUGH AT THE LOWER LEVELS

The leadership behaviour of senior management, middle managers and frontline supervisors is crucial to the successful implementation of the MOSH leading practices as stipulated in the MOSH Leading Practice Handbook. The MOSH process stipulates that the development of the leadership behaviour plan is critical to effective implementation of the selected leading practices. However, at

---

[10] Phakathi, S. (2009). Planisa! Gold Miners' Underground Practices. *South African Labour Bulletin*, 33(5):13-15. See also Phakathi, S. (2010). Workplace Change and Frontline Supervision in Deep-Level Gold Mining: Managerial Rhetoric or Practice? *Transformation*, 72(73):181-204.

the mine sites visited it did not seem that mine management had developed clear leadership behaviour plans through which to lead workers at the point of production. The mines did not appear to have followed the MOSH framework in developing their leadership behaviour strategies. That being said it was observed that across the mine sites visited, top management indeed demonstrated leadership in the implementation of the MOSH leading practices. However, turnover of senior management, closed management style and lack of safety leadership visibility at the point of production undermined effective implementation of the selected MOSH leading practices.

Without the visible support and commitment of top management the adoption of the MOSH leading practices will fail. Of particular significance here, is the impact of visible felt leadership behaviour on desired safety culture – that is to say the extent to which top management "walk the talk" towards the achievement of the mining industry's 2013 health and safety milestones and attainment of the zero-harm goal. Companies such as DuPont are passionate about zero-harm workplaces and regard visible felt leadership behaviour as one of the key factors towards developing a desired or excellent OHS culture in the workplace. Visible felt leadership behaviour entails meaningful commitment, accountability and passion for safety demonstrated through making time to consult and engage workers on safety goals and expectations and creating a caring and blame-free culture rather than a blame culture.

Visible felt leadership does not only entail personal visits to workers at the lower of the organisational hierarchy. Personal visits are just one part of it. There are various in which workers could feel management's safety leadership and commitment.

The extent to which management lead by examples or practice their safety messages above the ground and underground through various modes of communication that are authentic to the eyes, ears, minds and hearts of the workers is critically important to improving OHS performance. This is precisely what the MOSH Leading Practice Adoption System seeks to achieve.

In the mine sites visited for the MOSH evaluation study, with a few exceptions, it transpired from the focus group discussions that although top management played a crucial role in the adoption of the MOSH leading practices, its leadership was not strongly felt and visible enough to workers at the rock-face. The OHS research conducted in Australian coal mining companies discovered that a "closed" management style affected safety performance in generating hostility, misunderstanding and mistrust in management OHS actions [6]. Autocratic supervisory and leadership behaviours posed a serious threat to effective implementation of the MOSH leading practices. A number of workers, with a few exceptions, could not recount the names of the CEO's and Mine Managers of the mines they worked for. This demonstrates a lack of visible felt leadership at the production level. However, at one demonstration mine, workers and foremen appreciated the support of the CEO and the Management Committee of the mine:

- *"The CEO and mine manager gave us the opportunity to watch the [leading practice] in operation at another mine and to try out the [leading practice] at our mine." (Miner and shift-boss)*

The CEO of AngloGold Ashanti was praised by workers for initiating the Simunye [an isiZulu word denoting We are One] team project – an initiative workers are proud of in that it allowed them to voice their concerns on issues relating to safety and production such as the mechanical failures relating to the HILTI drill. The workers said that this initiative also encouraged them [workers] to fix problems in the workplace. One Simunye trainer shared the same view and pointed out that the Simunye team initiative produced excellent results for the crews who had been on the project not only in terms of production and safety bit also on terms of work relations at the point of production underground. The trainer went on to say that the Simunye team project brought senior management closer to workers in that on Day One the Management Committee met the crews at the training centre to discuss all matters pertaining to safety and production including the implementation of the MOSH leading practices.

Workers did indicate that the issue of production pressure and factors compelling workers to work unsafely varied from workplace-to-workplace and section-to-section and greatly depended on the leadership behaviour of the shift-boss and/or mine overseer as well as perceived commitment of

management to workplace health and safety. For instance, at a demonstration mine the support they received from their shift-bosses to ensure effective implementation of the leading practice was noted. As one team leader pointed out:

- *"Management is very concerned about safety. I do not want to lie, they are serious about safety. But we blacks are ignorant and we end up having fatalities. But the management here is trying to avoid accidents. If we were working according to the regulations of the mine there wouldn't be a single fatality. If we were following mine regulations even a small incident wouldn't happen. That's true because even when you come across a manager, the first thing he would tell you about is safety. So that shows they are concerned about safety. Before he says anything he talks about safety. I've never experienced a situation where they insist that you drill when it is unsafe. They say instead you should wait rather than go on drilling and causing accidents. I would be lying if I say they force you to drill even if it is unsafe." (Underground work team)*

These worker remarks suggest that workers felt the visibility of the leadership of their supervisors and management commitment to the implementation of the leading practice in spite of the technological challenges.

Important to note though in the workers' and supervisors' remarks is the mixed messages regarding the manner in which management's safety leadership and commitment impacted on their well-being down the mine. This therefore shows that the safety leadership of senior management was perceived differently across the mine sites depending on the leadership behaviour of the concerned manager or supervisor.

3.4.2.5 MIXED MESSAGES AND INCONSISTENT ACTIONS: LACK OF COORDINATED COMMUNICATION

The MOSH Handbook states that as part of the leading practice adoption process, the mines need to develop behavioural communication plans to complement the leadership behavioural plans. Therefore leadership and communication behaviours are inseparable in the MOSH process. As noted above, at the mine sites visited leadership behaviour and communication behaviour plans were not implemented in a coordinated fashion. The workers' and supervisors' remarks presented above indicate that management's leadership behaviour in the implementation of the MOSH leading practices was plagued by mixed messages and inconsistent actions. Workers were of the view that that their supervisors tended to be inconsistent in the safety actions and did not practice the safety message at the point of production:

- *"… through MOSH we are able to see the potential danger – we could not see the danger, but by undertaking MOSH, we identify problems which we have to stop and fix. Whilst we're fixing the problem so that we could work safely, the miner says we are drilling over there. Then they leave and go where the miner says. That is what causes accidents. MOSH helped us because it allows us to see potential danger, but then we are exposed to danger by another person who is our leader. I agree with these gentlemen, the main problem in our shafts is that the instructors would teach us about MOSH, and when they leave our leaders; the miners or the shift-bosses would say let's just continue as we did before, even if it is clear that it is not safe and there is no support. Those are some of the problems we come across." (Underground work team)*

One team worker added the following:

- *"… it does happen that they force us to go in even if it is not safe. We would agree amongst ourselves that we are not going in, because we see that it is not safe. In other places workers would be forced to go in because the leader is scared of the boss." (Team worker)*

Although there was widespread health and safety communication on the surface, change houses, management offices and underground waiting places, the written communication was to a large extent focusing OHS management systems in general and did not seem to fully integrate the MOSH process. This was evident in the OHS power-point presentations management made to the CSMI Evaluation Team as part of the induction process given to new employees and visitors. The MOSH Evaluation Team's observations revealed that the MOSH related written form of communication took

place at the training centre. Workers spoke about MOSH without knowing what the acronym stood for. They however knew that it had to do with improvement of OHS performance in South African mines. They called the entry examination and making safe leading practice MOSH.

While there was some form of MOSH related communication in the mine sites visited, such communication was not well coordinated and did not effectively reach workers at the rock-face. Hence, a number of production workers could not tell what MOSH stood for and had not even seen the MOSH Handbook at the training centre nor brought down the mine by their supervisors. Effective communication need not formal or informal and depend much on the personality and approach of the manager or supervisor. Although language did not appear to be a barrier to MOSH related communication, it would however be good that the MOSH related communication is presented in other African languages widely spoken by the underground workers given the limitations of fanakalo. At one source mine, a worker said that certain workers found it difficult to read safety communication because it was written in English but those who understood English explained the message to fellow workers.

3.4.3 CONCLUSIONS AND RECOMMENDATIONS

There is no doubt that in the mines visited, workers, supervisors and management have embraced the MOSH leading practices and recognise the potential impact of the MOSH initiative towards the achievement of the 2013 health and safety milestones and attainment of the zero-harm goal in the South African mining industry. However, the research discovered that the mines studied adopted the MOSH process and implemented the identified leading practices in ways that suited their operational contexts rather than as it is stipulated in the MOSH Handbook.

The mine sites visited were also not focusing on a single leading practice but were implementing a number of leading practices from a range of sources, including the MOSH Adoption System. Although the underground work teams referred the leading practices adopted by their mines, they did not know much about the MOSH process and did not even mention the mental models. This is contrary to the intention that the mental models were the means through which to ensure that the implementation of the MOSH Project was truly "people-centred".

There were also disconnects in what the workers, supervisors and management said about the MOSH process and the leading practices. Although the workers acknowledged the advantages of the MOSH leading practices, the implementation of the HILTI drill, fogger and FoG leading practices were marked by a series of unintended consequences and generated new challenges in the underground workplace. Production pressures, material shortages, equipment failures and poor maintenance of equipment hindered the effective implementation of the MOSH leading practices and compelled workers and supervisors to take shortcuts with potentially serious implications for worker health and safety and risk management.

Moreover, at the point of production underground, workers questioned the commitment and leadership behaviours of their supervisors and top management towards the creation of a healthier and safer mining workplace. At the point of production, management's safety leadership tended to be plagued by mixed messages and inconsistent actions. Mines part of one mining company appear to have effectively cultivated a culture of worker engagement a lot better than the other mines as illustrated by the team building project in most aspects pertaining to the gold mining business including the adoption of the MOSH leading practice. Although the mine sites visited engaged workers through different forms of communication, such communication did not seem be well coordinated, strategic and effective in helping workers understand the MOSH process. Workers were also not particularly content with the lack of accreditation of the on-the-job training. For this reason, workers did not classify MOSH related demonstrations, meetings and on-the-job training in that it failed to recognise formally the knowledge and skill acquired from such a process.

PART 3

4 OVERALL CONCLUSIONS AND RECOMMENDATIONS

These summary conclusions and recommendations are arranged according to the brief received by the CSMI for the evaluation study.

4.1 ROLE OF MOSH IN A CHANGING MINING ENVIRONMENT

The role of MOSH to facilitate the adoption of leading practice continues to be important. At company and mine site level the evaluation of different technologies and practices is seen as particularly useful. It was said to results in significant human and financial resource savings at this level which would be expended on similar efforts to achieve same. Company and site level searches for leading practices were also said to be less effective than those of the MOSH system, since the system is able to access learning across the sector and beyond.

It is the exception rather than the rule for mental modelling, leadership behavioural plans and communication plan to conform to the guidelines set out in the Handbook. However, the principle of finding out what implementers think of and understand about proposals to introduce leading practice is widely appreciated. Where engagement processes are well founded, they have been strengthened by efforts to address the specific issues raised by workers, supervisors and managers of operations.

Therefore, it is recommended that:

- The MOSH project continues as a flagship initiative of the sector, albeit with changes as set out in this section.

- More flexibility is required for the people-related aspects of the adoption system. This is necessary because companies and mine sites are at different points (different levels of maturity) in addressing changes in culture and work relationships. In some instances more than what the MOSH process prescribes is required, and in other cases it is appropriate to incorporate the MOSH process into company or site-level strategy.

4.2 KEY ROLE PLAYERS AND MOSH

Role players such as the Mine Health and Safety Inspectorate and the trade unions have different perspectives on and entry points to MOSH. The Mine Inspectorate is concerned about role conflict, and does not see itself directly involved in selecting and endorsing leading practice. The Chief Inspector of Mines indicated that he would engage with MOSH at the Mine Health and Safety Council (MHSC). Trade unions concur that the MHSC is the correct place for strategic discussions about MOSH, but also see a deep role for themselves at regional, company and site level. This position is tempered by realisation that they – the unions – do not have sufficient resources to engage effectively at all levels and locations.

Recommendations are therefore that:

- The decision to convene an Advisory Group should be revisited. The MHSC is the appropriate tripartite forum in which to engage with labour and government. It is also the forum at which the tripartite partners themselves wish to be engaged.

- Strategic inputs are sought from the MHSI and Labour at the MHSC.

- Union involvement should continue to be sought at all levels MOSH, and to be respected as it is currently.

4.3 MOSH OBJECTIVES AND STRATEGY

Lack of clarity about specific objectives and strategies of MOSH leads to differences in expectations among stakeholders and role players. It also contributes to the difficulties observed in articulating performance measures and accountabilities.

For example:

- The objectives of MOSH should be clarified. For example, to facilitate the achievement of the 2003 health and safety milestones, to enable a people-centred approach to change management, to facilitate the adoption of leading practice or a combination of these.

- MOSH strategies must be revisited for alignment with the objectives, and consideration of what is required pre- and post-2013. For example:

  - Identify leading practice associated with the control major OHS hazards and to do this in accordance with risk management principles;

  - Uncover and address the beliefs, knowledge and concerns associated with specific OHS hazards and leading practice, and to do so in a variety of ways to shorten the MOSH adoption process and suit the circumstances found on mine sites.

  - Document learning so that mine sites can move forward with greater insight into what is required of them and what problems are likely to surface; and

  - Focus on those commodities and sites which provide the best opportunities for improving of OHS performance.

- The MOSH Task Force undergoes urgent review. The functions of the Task Force such as an annual workshop to discuss MOSH strategy are instituted and managed by the Head of the Learning Hub. The role of the Task Force to oversee adoption activity must be more rigorously respected through the appropriate presentation of reports and other related activities. The Head of Learning Hub, as it pertains to the MOSH Leading Practice Adoption System, must set the agenda for the MOSH Task Force. The present Terms of Reference are an adequate framework for such a review.

4.4 STRUCTURE

4.4.1 GOVERNANCE

The governance structures of the system are not functioning as designed and there is confusion about roles and responsibilities. Changes over time in the role of certain structures such as the MOSH task force are contributing factors. Multiple oversight and advisory structures also blur decision-making responsibilities, making it possible for problems to shift back and forth between these structures. For example concerns over secondments, the need to prioritise leading practices to achieve "quick wins", and the length of time taken to complete a MOSH cycle have been raised in all the governance structures, without resolution.

- The structures must then be redefined to accommodate the revised strategy.

- Examine the basic governance processes including criteria for key personnel involved at this level.

- The MOSH Task Force undergo urgent review. The functions of the Task Force such as an annual workshop to discuss MOSH strategy are instituted and managed by the Head of the Learning Hub. The role of the Task Force to oversee adoption activity must be more rigorously respected through the appropriate presentation of reports and other related activities. The Head of Learning Hub, as it pertains to the MOSH Leading Practice Adoption System, must set the agenda

for the MOSH Task Force. The present Terms of Reference are an adequate framework for such a review.

- The viability of the MOSH Task Force carrying other industry wide initiatives such as the Centre of Excellence and Culture Transformation should be reconsidered in the light of the MOSH Adoption project needing to scale up. It is the opinion of evaluation team that the MOSH Task Force should in the light of delivery demands and the imminence of the 2013 milestones make the delivery of the MOSH Adoption System their first priority.

- The MOSH Advisory Group should not replace the role of the MOSH Task Force. It is not advisable to have two entities playing an oversight role. The decision to convene an Advisory Group should be revisited. The MHSC is the appropriate tripartite forum in which to engage with labour and government. It is also the forum at which the tripartite partners themselves wish to be engaged.

- The MOSH Co-ordinating Committee is an important structure that provides accountability of the Learning Hub to the COM. This committee should support the process of decision-making at the appropriate level of the MOSH Project by agreeing what are implementation issues for the Learning Hub and/or Adoption Teams and what needs resolution at the level of governance through the MOSH Task Force or MHSC.

4.4.2 LEARNING HUB

The effect of the Learning Hub has not yet been felt by the Adoption Teams and on mine sites. One reason is that the Hub is still being established. The absence of effective communications and visible leadership are the main concerns expressed about the Hub. On the other hand, administrative and process support which is to be provided by the Hub is keenly awaited.

- MOSH trainees and MOSH Adoption Specialists (to date unfilled posts in the Team) can usefully complete tasks presently inadequately met by the Adoption Teams. One of these functions is documentation that presently happens inconsistently within teams and the other is conducting mental model interviews and providing the link between operational level and central reporting.

- All contracts in the Learning Hub must include deliverables that are reviewed regularly. This will create better accountability.

- The Head of the Learning Hub should lead the process of staffing the Learning Hub as stated in the MOSH Handbook. Alternatives to full secondments should be explored and attractive packages secured (This could include international exposure, site visits, networking and publishing opportunities) that make time in the Learning Hub worthwhile for very experienced staff and for companies seconding staff. Where this strategy seriously falters it should be elevated to the level of governance.

- The M&E and behavioural specialists should establish small technical groups to support their work. The purpose of these technical teams would be to primarily provide advice, the opportunity to think through the challenges in these areas and to identify a range of possible approaches. Where appropriate members of the technical team can support the documentation of work as needed. The additional capacity will help the MOSH system respond more flexibly to the different demands arising from the operational level by introducing more open thinking for both approaches to behaviour change and monitoring and reporting as well as providing consistency at the centre.

- By tightening decision-making and roles and responsibilities it is expected that the role of the MOSH Sponsor will reflect that described in the Handbook.

- A flexible technical assistance fund may support the Learning Hub to work more efficiently. For example, the preparation of documentation could be given as a short-term assignment to a consultant/s, depending on the strength of the Adoption Specialists and trainees.

- The capacity for effective communication and stakeholder engagement and management are very inadequate in the Learning Hub. The Learning Hub should take immediate action to address this gap. The Learning Hub should consider using experienced communication specialist/s from industry and/or consider reallocating existing posts in the Learning Hub to specifically address communication and stakeholder management.

- User-friendly versions of print materials and short audio visual clips of progress and learnings are also necessary. A budget to produce simplified MOSH print and electronic materials and additional short term and ad hoc technical assistance such as use of communication facilitators to meet specific needs will build capacity.

- Stakeholder engagement such as the management of external stakeholders such as government, labour and representatives of industry is an important part of MOSH activity. The Head of the Learning Hub must play a leading role in the engagement of key stakeholder groups e.g. SACMA, AMMSA, MHSC, MHSI and labour.

4.5 MOSH AT THE MINE SITE

Strategic messages are distilled to simplistic levels at the shop-floor and workers have raised concerns about the recognition of training associated with MOSH, and the exacerbation of production processes when leading practices extend the preparation time and/or prolong the workday.

- Trainees and Adoption Specialists could assist in building a broader understanding of the MOSH system across staffing levels in the sector, particularly lower levels.

- Whether training processes associated to MOSH can be aligned with the process agreed at MQA should be explored.

4.6 MOSH HANDBOOK AND PROCESS

The Handbook which guides the process for identifying, document, demonstrating and facilitating the adoption of leading practice is comprehensive. It is also too detailed and inflexible. Users are unable to grasp the essence of the Handbook without considerable assistance from the Adoption Team leaders. Circumstances rather than the prescribed guidelines dictate how things should be done in practice.

Therefore, the Handbook should:

- Be simplified to make the principles and key steps clear to implementers at mine sites.

- Set out what needs to be done rather than how to do things.

- The guidance and templates in the Handbook should be organised into an accessible resource enabling users to access material on how undertake specific tasks.

Simplification should:

- Be a well-managed process that includes consultation and sign off.

- Involve a group of experienced individuals from across the MOSH implementation team be identified as individuals asked to comment on drafts of simplified tools.

- The Head of the Learning Hub should sign off on all completed products. Again tightening decision-making and accountability will ensure that the Learning Hub gets the deliverables it needs.

4.7 EFFICIENCY AND EFFECTIVENESS

Most interviewees were anxious about the length of time it takes to complete a leading practice cycle (between 12 and 18 months) and the absence of evidence of the impact of the adoption system. Stakeholders outside of the Chamber of Mines especially, hold the latter view. The implementation of MOSH is out of alignment with the 2013 milestones (as being too slow). Evidence that MOSH is working is not available at industry-level, although site-level results are available and generally positive.

Therefore:

- The MOSH adoption process should be shortened by eliminating the demonstration mine step.

- The MOSH adoption process could be shortened by considering sector wide or commodity level options to achieve the objectives of mental modelling, and leadership behaviour and behavioural communication plans.

- Mine-site level data of the impact of MOSH leading practice should made available at industry level as key measures of the effectiveness of MOSH.

- Leading practices should feature in the decision-making processes of mining companies such as strategic planning and budgeting. Clarify where or when decision-makers of mine companies can be most effective, and reach agreement on how to obtain the required presence and inputs.

4.8 CAPACITY AND RESOURCES

The complexity of the MOSH Adoption System creates resource deficits in certain areas such as in mental modelling and leadership behaviour and behavioural communication planning.

Thus, people with the right skills, capacity and/or qualifications should be brought on-board in the MOSH process to appropriately lead skills development with respect to addressing "people" issues. The extent of customisation of technology required at mine sites and the effort required to roll out leading practice such as the entry examination in mines with a large workforce has been underestimated.

It is therefore necessary:

- To create readiness at mines to carry sustain efforts to adapt technology and the rollout of new practices. This means working on cultural transformation across the sector whether leading practices are being rolled out or not, and expecting the adoption teams and mine management to work out how best to embed new practices and technologies.

Another unanticipated problem is related to COPAs. It is not clear whether each leading practice requires a COPA of its own, how COPAs address the needs of members at different stages of adoption, and when COPAs can be dissolved. COPAs are working.

- The experience of the COPAs should be reflected in the MOSH Adoption System. COPAs may have finite lives and the learnings from the COPAs should be captured and transferred.

4.9 MONITORING AND EVALUATION FRAMEWORK

The progress and impact of MOSH is described in very general terms at sector level. While specific information is not available at this level, more detailed information is available at other levels of the project. For example, adoption team leaders have developed frameworks of their own for monitoring the rollout of specific leading practices and at mine-sites, impact data are available in a variety of forms.

Given the complexity of the MOSH project, its performance cannot adequately be reflected in a handful of numerical measures. The following approach is recommended:

- **One integrated M&E framework** is developed across all the leading practice areas premised on improving OHS performance as the ultimate impact.
- The impact of the MOSH Adoption System should be assessed through improved OHS performance at a national level and at an operational levels at specific mine sites.
- A series of outcomes is developed for the whole project *directed at* optimising strategy, tools and processes and tracking the rollout of leading practices. These can be designed for the levels of governance, resources and capacity and implementation.
- Evaluation is sometimes more useful than monitoring and this should be borne in mind when designing the monitoring and evaluation framework.
- Process and quality indicators could also be considered.
- An appointed specialist (either in the Learning Hub or external to the Learning Hub) develops a monitoring and evaluation framework. This to be done in consultation with a small technical panel with expertise in this area, adoption team leaders, and members of core structures of the MOSH project.
- A variety of assessment methods are used, as appropriate including quantitative and qualitative measures. Also means of verification can include on-going measures and snap shot measures taken every 6 months for example.
- The assessment framework should be kept **as simple as possible** and is signed off by the Head of Learning Hub to ensure accountability and alignment with all other aspects of the MOSH Project.
- The following is suggested at starting point for developing an M&E framework.

Possible impact indicators:

1. South African OHS performance in the mining sector shows year on year improvements (national level)

2. Improved OHS performance at adoption mines (mine site level)

Possible input, output and outcome indicators

Level of Project	Input	Output	Outcomes
Governance	MOSH Task Force meets quarterly	Reported and demonstrated evidence of action on strategic issues	MOSH Adoption System strategy responsive and aligned with South African OHS performance
	Annual review of MOSH Adoption System Strategy conducted annually	Revised strategy communicated widely within industry and with tripartite partners	

Resourcing and Capacity	Adoption Teams fully staffed and resourced	Adoption Teams meet agreed delivery targets	50% of industry actively engaged in adoption programme by ? year
Implementation	No. of mine personnel engaged with Adoption Teams and MOSH tools	Evidence of leading practice adoption against a checklist of activities at specific mine sites	No. of mines with a leading practice or practices embedded for one year

4.10 SUSTAINABILITY

In its current form the Adoption System is unsustainable, as the process is not implemented as intended. This will diminish the value of the system over time as this gap becomes more and more visible. Clarity over the purpose and strategy of MOSH, and performances measures of the extent of implementation and impacts are also crucial for the sustainability of the project. How otherwise is the continuation of the project to be justified?

4.11 WIDER APPLICATION OF MOSH

While, in principle, the people related aspects of MOSH are transferable to other endeavours such as HIV and TB programmes, no evidence of this was encountered. The durability of the Health Belief Model which emerged in Europe in the 1950s as a tool to strengthen public health programmes supports the assertion that such approaches like mental models have a place in strategies to bring about change.

On mine sites, no evidence of application of the MOSH process to other change management issues was encountered. The opinion of the evaluation team is that it is important not to overwhelm the MOSH project with competing priorities.

APPENDIX 1: CASE STUDIES

To be developed when the site visits are completed.