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Attention: Chairperson

SIMRAC

MHSC

RE: SIM 13-01-02: HOW CAN WE BEST MONITOR BEHAVIOUR CHANGE FROM INTERVENTIONS RELATED TO THE PEOPLE-CENTRED ADOPTIONS OF LEADING PRACTICES?

1. INTRODUCTION

The final draft report dated 24 October 2014, SIM 13-01-02 prepared by the research agency: Mundele Business Consultancy refers. The MOSH Learning Hub considered the report in its entirety including comments made by the MOSH Task Force members on 17 October 2014, when the researcher made a preliminary presentation.

2. OPENING REMARKS

Since people issues, particularly leadership behaviour and behavioural communication are central to the MOSH Leading Practice adoption system, it was important to develop and pilot test valid and reliable standard scientific instrument(s) to measure behavior change (of deciders, adopters, and key stakeholders) arising from or required for successful and sustainable adoption of MOSH leading practices among all levels of participants in the leading practice adoption process.

In MOSH terms, it is important to understand the differentiation between the following groups of people for purposes of grasping the context and design of this research study:

Deciders (leaders) are those people who are directly involved in making the initial decision at a mine to adopt the leading practice, or who have a significant influence on the decision making process.

At a typical mine, this usually include the general manager, mine manager, production manager, occupational and safety manager, and the relevant specialist(s) depending on the nature of risk in question.

Adopters (workers) are people who will be expected to perform a procedure or practice, or use a

particular product or service, as part of operating a leading practice, or who are responsible for directly supervising such activities.

***Key Stakeholders** are individuals, groups or organisations that may be affected by, or perceive themselves to be affected by the risks being addressed by the leading practice, and who may in some way influence the adoption process.*

3. OBSERVATIONS FROM THE DRAFT FINAL REPORT

The MOSH Learning Hub makes the following observations having considered the draft final report in its entirety:

a) PURPOSE / AIM OF THE STUDY

- i. Despite the extensive literature review which the researcher has cited, their understanding of the purpose of the study seems to be limited to only one instrument, whilst on the other hand their focus was only on the behavior of leaders (the deciders) with limited emphasis on behavioural communication and its impact on the behavior of employees (the adopters) and the other individuals and groups who are likely to have significant interest in seeing the OHS risks reduced (the key stakeholders). Furthermore, since behavior is elusive in nature it could be better measured through a plethora of measurement instruments, particularly within the context of measuring and comparing behaviors of both leaders and those affected. It is against this backdrop that the researchers seem to have missed the need for stratifying the affected population in terms of their specific behaviours.
- ii. The researcher makes reference to behaviors of leaders and those affected by the leading practice adoption system instead of focus on people-centred adoptions of leading practices.
- iii. If properly done, there could be an opportunity that this study could fill an existing gap in the South African Mining industry. However, the researcher does not show which other mining jurisdictions in the world have done in this space.

b) CONTEXT OF THE STUDY

- i. Though it is commendable that reference is made to the Culture Transformation Framework, there is no mention of the minimum standards for both the Leadership and Adoption of Leading practices pillars and their relevance to the study.
- ii. The leadership behaviours identified in the 2008 Tripartite Action Plan is are not mentioned, let alone their relationship to this study.

- iii. The Leadership Assessment Tool (LAT) which was piloted to the Heads of South African operations and later revised and rolled out to the E-Band is not even mentioned let alone its relationship to this study.

c) THE MONITORING AND MEASURING FRAMEWORK

- i. The chosen M&E framework (in particular, the Participatory model) is to some degree, in line with the principles of the MOSH leading practice adoption system, particularly on issues relating to early worker involvement and training.

ii. Desired Leadership Behaviour

- i. The assertion by the researcher that the behavior of leaders and those affected by the leading practices gravitates towards influencing and enhancing a positive health and safety climate within the South African mines is correct. Particularly in view of the fact that MOSH makes reference the ABC model (Antecedents – *what the leader needs to know or do in order to achieve sustainable adoption*; Behaviour – *what the leader needs to say or do in actually adopting the leading practice*; and Consequences – *the nature of feedback / reinforcements leaders should provide to those they supervise to aid adoption of the leading practice*).
- ii. However and though relevant, the researcher's choice of the behavioral attributes listed on page 16 is not corroborated with the attributes measured through the Leadership Assessment Tool (LAT) used in line with the Culture Transformation Framework pillar on Leadership as informed by leadership behaviors contained in the 2008 Tripartite Action Plan.
- iii. .Secondly, the researcher does not make any linkages between these suggested attributes, the existing leadership behaviors (that is, both desirable and undesirable leadership behaviours) embedded in the existing leading practices; and the how these suggested attributes address the incorrect beliefs or misconceptions or knowledge gaps about the leading practices and the OHS hazards.
- iv. Thirdly, in determining the suggested behavior attributes the researcher did not take into account or even corroborate the outcomes of the key research findings contained in the study titled: "Improving Adoption of OH&S Technology & Best Practice: Mental Models Research Final Report (June 2007)" which is contained in section 15.1 of the MOSH Leading Practice Adoption System Handbook. This study identified a variety of ways that the participants (i.e Executives, Mine leaders) and other leaders can apply to enable the successful adoption of technology and best practices.

d) PROBLEM STATEMENT

i. The problem statement

- a. This statement is limited to behavior change of leaders, without emphasizing that it is leaders at ALL levels.
- b. In particular, the use of the words “My Supervisor” in all the 39 questions in the survey instrument gives an impression that the behavior change instrument is limited to supervisors who are just one of the three job categories making up the stratified sample of the study. Furthermore, it could have been useful to provide an explanatory note on the context of the use of “My Supervisor”.

ii. Sub-problems

- a. The comments made under c) (ii) above apply here as well.
- b. Refer to the detailed comments under Literature Review, Research Methodology and Presentation of Results below.

e) SIGNIFICANCE OF THE STUDY

If the study is properly conducted with the resultant behavior measurement tools, it would highly beneficial to the mining industry.

f) DELIMITATIONS OF THE STUDY

- i. Since MOSH makes a clear differentiation between adoption and implementation. The statement “Mines that have **implemented** leading practices” should read “Mines that have **adopted** leading practices”.
- ii. Adopting mines are in the Gold, Platinum and Coal sectors. However, the study only limited itself to the Gold sector.
- iii. Therefore, its applicability to the coal and platinum mines (which might have different dynamics) has not been tested.

g) LITERATURE REVIEW

- a) It is commendable that the researcher seems to have conducted extensive literature review particularly on each of the suggested behavioural attributes.
- b) However, the literature review fell short in that it did not reflect on the following critical aspects which has far-reaching implications for this research study:

- The minimum standards of the Leadership and Adoption of Leading Practices pillars of the Culture Transformation Framework
 - The findings of the Mental Models Report (June 2007).
 - The source mine reports, the leading practice adoption guides, leadership behavior plans and behavioural communication plans of the current leading practices being promoted – *these documents could have given the researcher an idea of the typical behaviours which are common across all the leading practices and for each of the decider, adopter and key stakeholder groupings.*
 - The Leadership Assessment Tool (LAT) used in line with the Culture Transformation Framework pillar on Leadership as informed by leadership behaviors contained in the 2008 Tripartite Action Plan.
- c) Despite purporting to have reviewed international previous research studies, the literature review does not comment on similar work on behavior measurement conducted in other international mining jurisdictions, especially those that South African mining industry considers to be notable benchmarks.
- d) Other internationally recognized work of BST and ICMM is not even mentioned within the context of this study.
- e) Furthermore, the literature review does not show clearly which engineering and manufacturing industries were used as benchmarks with clear cut comparative analysis.

h) RESEARCH METHODOLOGY

- a) The researcher purports to have used an exploratory study in order to develop a strategy for behavior change monitoring, however the following observations are made to show limitations of the study:
- i. *Research design*
 - ✓ the study was limited only to the quantitative research method therefore omitting the fact that behavior change is also qualitative in nature which could be best measured through qualitative research methods and/or a combination of various methods.
 - ii. *Research population* – Only the Gold mines were researched. Both platinum and coal mines with possible different dynamics were not reached and this has a direct bearing on the applicability of the study results to these sectors.

- iii. *Sampling methods and Study sites* – The study was limited only to the adopting mines (experimental group). However, the non-adopting mines (control group) could have also been included as part of control group vs experimental group design approach.
- iv. *Questionnaire administration*
 - ✓ It is highly commendable that the researcher gives an outline of the key administrative issues such as need for introductory covering letters, the face-to-face data collection, self-administration, little need for interpretation into appropriate languages, venue and time arrangements as well as the need for availability of respondents with assistance from individual mining operations.
 - ✓ However, it is also noted that no guidelines or instructions are provided on how to conduct or use the survey tool.
- v. *Data Analysis* – the availability and licensing conditions, costs and skills requirements to apply the Statistical Package for Social Sciences (SPSS) Version 22 software technology have not been clarified.
- vi. *Research instrument*
 - ✓ Nowhere in the research study does it indicate the behavior changes generally required of adopters (leaders, workers and other stakeholders) for effective sustainable adoption of MOSH leading practices. Given the purpose of the study, this should have been set out as the key starting point. It is these behaviours that need to be measured and monitored.
 - ✓ Identification and consideration of these behaviours would have provided the necessary context and direction for the literature review and the design of the study.
 - ✓ The limited focus of the study to the behavior of supervisors led to its incompleteness in that it did not deduce the behavior of workers as adopters of leading practices and the behavior stakeholders who have an interest in the risk being addressed by the leading practice(s).
 - ✓ The instrument seems to simply measure reaction to statements on a five point scale and it does not provide an opportunity to further probe and elicit the underlying causes of behavior.
 - ✓ Furthermore, in designing the measurement tool(s) and since measurement of behavior change is elusive, the following could have been considered in

the development, pilot testing and administration of the behavior measurement tools:

- Use of multi-sources - that is, a combination of measurement tools such as a survey, a self-report, third party observations of behavior in the workplace and any other relevant tools.
- Development of behavior measurement tools for each of the groupings, that is, leaders and people affected by adoption of leading practices, namely the Deciders, Adopters, and Stakeholders.
- The need to collect feedback about work behavior before and after employees have been exposed to the leading practices (that is, pretest / posttest design).
- The behavioural constructs, despite being relevant, are too general and seem not measure behavior change directly linked to adoption of particular leading practices. Thus, the instrument assumes that leadership behavior is the only area focus (be all and end all).
- Despite a commendable high set of psychometric properties of the instrument:
 - The detailed factor analysis of the data to show the reliability and validity of the instrument as a means of measuring the leadership attributes identified in the study does not address or overcome the flaw of the study in terms of achieving the objective of the study.
 - ✓ Internal consistency (reliability) to determine whether or not all items that make up a single dimension measure the same construct and whether or not there are enough items to measure it adequately.
 - ✓ However, it is concerning to note that most of the respondents used the positive side of the scale as confirmed by the analysis and as seen in the skewness of the scale.
 - ✓ Validity including sampling adequacy scores are relatively high
 - ✓ However, the question remains whether the instrument can indeed measure adoption as a

behavior change – in the form of leaders behavior, worker behavior, stakeholder behavior as a constructs

- The need for using focus groups involving the following people to decide and select behavior dimensions (attributes) to be included in the survey instrument / on the job behavior observation checklist / self-report:

- ✓ Managers (CEO, Executive, Operational levels)
- ✓ Workers
- ✓ Supervisors
- ✓ Stakeholders

i) PRESENTATION OF RESULTS

The response rate

- i. 93% of fully completed questionnaires (289 out of a possible 312) is highly commendable response rate.

Demographic data

- i. *Mining operations* - only the Gold mining operations were involved in the study, leaving out the other two major sectors, namely Platinum and Coal which leaves a question on the transferability of the results to these sectors given the different dynamics they may experience.
- ii. *Job and Other Categories*
 - ✓ the percentage split among the general workers, supervisors and managers seems to be representative enough. The same can be said of the other percentage splits in terms of Age, Mining Experience in Years and Gender.
 - ✓ However, the percentage splits in terms of Race is heavily laden towards Black with very minimal representation for White.

Results of Desired Leadership Behaviours

- i. The outcome of the research may be acceptable if you want to measure changes in behavior in general.

- ii. The tick box approach that does not explore behavior in any depth but simply measures a reaction to statements.
- iii. The results from the survey in the report shows surprisingly high levels of acceptable behavior in our mining industry – something that experience does not confirm.
- iv. Knowing the industry and the way these surveys will be administered, there will always be a bias to looking better than we are.

j) INTERPRETATION AND DISCUSSION OF RESULTS

About Interpretation of Results of Demographics

- The comments in the above paragraph apply.

About Interpretation of Results of Desired Leadership Behaviour

- a) Though generally relevant, the researcher's choice of the behavioral attributes listed on page 16 of the draft report is not corroborated with the attributes measured through the Leadership Assessment Tool (LAT) used in line with the Culture Transformation Framework pillar on Leadership as informed by the leadership behaviors identified in the 2008 Tripartite Action Plan.
- b) Secondly, the researcher does not make any linkages between these suggested attributes, the existing leadership behaviors (that is, both desirable and undesirable leadership behaviours) embedded in the existing leading practices; and how these suggested attributes address the incorrect beliefs or misconceptions or knowledge gaps about the leading practices being promoted and the OHS hazards in general.
- c) Thirdly, in determining the suggested behavior attributes the researcher did not take into account or even corroborate the outcomes of the key research findings contained in the study titled: "Improving Adoption of OH&S Technology & Best Practice: Mental Models Research Final Report (June 2007)" which is contained in section 15.1 of the MOSH Leading Practice Adoption System Handbook. This study identified a variety of ways that the participants (i.e Executives, Mine leaders) and other leaders can apply to enable the successful adoption of technology and best practices, as well as possible barriers to successful and sustainable adoption of MOSH leading practices.

k) CONCLUSION AND RECOMMENTATIONS

1) About the Research Study Conclusions

- a) The research study has not directly addressed the development of an instrument to measure and monitor the behavior changes arising from the MOSH leading practices or required of Adopters (ie. leaders, workers and stakeholders) to achieve successful and sustainable adoption of MOSH leading practices.
- b) Instead, the research study has developed an instrument aimed at measuring a selection of leadership attributes identified for the purpose of achieving an improved OHS culture.
- c) The research study did not directly show that the instrument is capable of measuring the behavior changes expected to arise from the adoption of MOSH leading practices.
- d) The ability of the 39-question instrument to measure the behaviours required by MOSH leading practice has not been shown. It simply said that “the instrument was developed on the basis of the findings from the review of literature and the MOSH consultative process”.
- e) The development of the survey instrument (the 39 questions) was not adequately explained in relation to behavior change arising from adoption of MOSH leading practices.
- f) Regrettably, the development of the survey instrument as a means of measuring and monitoring the behavior change required for adoption of MOSH leading practices has not been demonstrated.
- g) The detailed factor analysis of the data to show the reliability and validity of the instrument as a means of measuring the leadership attributes identified in the study does not address or overcome its flaw in terms of achieving the objective of the study.
- h) The use of the instrument to collect data from mines that have adopted MOSH leading practices does not provide data capable of showing that the instrument is capable of measuring the behavior change required for sustainable adoption.
- i) The ability of the instrument to measure these changes has also not been shown.

2) About the Research Study Recommendations

a) The Behaviour Monitoring Model

Notwithstanding the concerns about the misdirection of the study, the recommendation that the generic monitoring model depicted in Fig.1 & 8 be followed in the leading

practice adoption system is in itself unreasonable as generic recommendation. If it were to be followed using a survey instrument shown to be valid for regularly measuring behavior change arising from adoption, with a view to improvement aimed at ensuring sustainable adoption, it would be acceptable recommendation.

b) Desired Leadership Behaviours

When the recommendation requires MOSH Learning Hub to enforce training to achieve the “desired leadership behaviors” shown in Table 46, the advice becomes totally unacceptable.

The identified behaviours are directed at achieving improved OHS culture and are not clearly focused on achieving successful and sustainable adoption. Rather, they are attributes of behavior that do meet the MOSH NORMS criteria and the training required to achieve them is neither clear nor straight forward.

c) Training of Desired Leadership Behaviours / Implementation of Desired Leadership Behaviours

It is inappropriate to recommend that MOSH become an agency to enforce leadership training provided by an external service provider as this would be counter-productive to the achievement of voluntary and eager adoption. There is little doubt that it would lead to failure of this key principle of adoption, and to discontinuation of industry support for the MOSH leading practice adoption system.

d) The Survey Instrument / Monitoring of Desired Behaviours

The recommendation that MOSH must adopt the survey instrument set out in Appendix A to monitor behavior is also inappropriate.

The instrument has not been shown to measure the particular behaviours required of Adopters (leaders, workers and stakeholders) for successful and sustainable adoption of MOSH leading practices.

The instrument appears to have been developed to achieve the broad leadership and OHS culture goals of the Culture Transformation Framework as opposed to that of monitoring the behavior changes required for and/or arising from successful and sustainable adoption of MOSH leading practices.

I) GENERAL COMMENTS

Positives

- i. In general, the document is well written from a spelling and grammatical point of view and it was fairly edited.
- ii. The structure of the document including the hypotheses is acceptable.
- iii. Extensive literature review has been conducted and it is highly commendable – providing excellent theory, however the SA mining industry has challenges that make this rather theoretical.
- iv. 93% of fully completed questionnaires (289 out of a possible 312) is highly commendable response rate.

Areas of Concern

- i. Incomplete referencing of the personal statements made by individuals, particularly MOSH Learning Hub representatives (For example, Van Der Merwe, 2012),
- ii. Inaccurate statements related to those quoted, and use of inappropriate examples on page 24.
- iii. Figure 8: The Behaviour Monitoring Model is not appearing in the report (refer to pages 78 and 79).
- iv. Incorrect statements about MOSH and how it works – this demonstrates a lack of understanding of the MOSH system on the part of the researcher.
- v. The outcome of the research may be acceptable if you want to measure changes in behavior in general.
- vi. The tick box approach that does not explore behavior in any depth but simply measures a reaction to statements.
- vii. The results from the survey in the report shows surprisingly high levels of acceptable behavior in our mining industry – something that experience does not confirm.
- viii. Knowing the industry and the way these surveys will be administered, there will always be a bias to looking better than we are.
- ix. There should have been guidelines in the report to administering the survey.
- x. Probably a different instrument that allows some probing to discover the real behaviours.

- xi. The biggest problem is that the instrument will only measure general behavior change and not the part that people-centred approach (ie. leadership behavior and behavior communication) played in adoption of leading practices.
- xii. Assessment of behavioural change in general miss the reason for the research study.
- xiii. Some of the vexing and answered questions include:
 - a. Where and how is the leading practice specific behavior addressed?.
 - b. Are we saying that leadership behavior is the be all and end all, where are the adopters' behavior addressed? Where are desired behaviors for subordinates in this report?
 - c. How does the Monitoring and Measuring Framework differ from what a typical mine would use for behavior climate studies?
 - d. Where does the suggested behaviours come from? The mining industry or literature?
 - e. How was it concluded that a survey instrument is the best way? What other options were considered and where are these described?

m) FINAL THOUGHTS

About the Draft Report

- a) The research study has not directly addressed the development of an instrument to measure and monitor the behavior changes arising from the MOSH leading practices or required of Adopters (ie. leaders, workers and stakeholders) to achieve successful and sustainable adoption of MOSH leading practices.
- b) Instead, the research study has developed an instrument aimed at measuring a selection of leadership attributes identified for the purpose of achieving an improved OHS culture.
- c) The research study did not directly show that the instrument is capable of measuring the behavior changes expected to arise from the adoption of MOSH leading practices.
- d) The ability of the 39-question instrument to measure the behaviours required by MOSH leading practice has not been shown. It simply said that “the instrument was developed on the basis of the findings from the review of literature and the MOSH consultative process”.
- e) The development of the survey instrument (the 39 questions) was not adequately explained in relation to behavior change arising from adoption of MOSH leading practices.

- f) Regrettably, the development of the survey instrument as a means of measuring and monitoring the behavior change required for adoption of MOSH leading practices has not been demonstrated.
- g) The detailed factor analysis of the data to show the reliability and validity of the instrument as a means of measuring the leadership attributes identified in the study does not address or overcome its flaw in terms of achieving the objective of the study.
- h) The use of the instrument to collect data from mines that have adopted MOSH leading practices does not provide data capable of showing that the instrument is capable of measuring the behavior change required for sustainable adoption.
- i) The ability of the instrument to measure these changes has also not been shown.

o) About the MHSC Advisory Note

It is recommended that the advisory note in relation to SIM 13-01-02 should be drastically revisited and totally reviewed based on the following concerns:

- a) Given that the advisory note arises from a study considered not to have properly addressed the questions of monitoring behavior change arising from interventions to achieve people-centred adoption of MOSH leading practices.
- b) Notwithstanding the concerns about the misdirection of the study, the advice that the generic monitoring model depicted in Fig.1 be followed in the leading practice adoption system is in itself unreasonable as generic advice. If it were to be followed using a survey instrument shown to be valid for regularly measuring behavior change arising from adoption, with a view to improvement aimed at ensuring sustainable adoption, it would be acceptable advice.
- c) When the advice requires MOSH Learning Hub to enforce training to achieve the “desired leadership behaviors” shown in Table 1, the advice becomes totally unacceptable.
- d) The identified behaviours are directed at achieving improved OHS culture and are not clearly focused on achieving successful and sustainable adoption. Rather, they are attributes of behavior that do meet the MOSH NORMS criteria and the training required to achieve them is neither clear nor straight forward.
- e) It is inappropriate to advise that MOSH become an agency to enforce leadership training provided by an external service provider as this would be counter-productive to the achievement of voluntary and eager adoption. There is little doubt that it would lead to failure of this key principle of adoption, and to discontinuation of industry support for the MOSH leading practice adoption system.

- f) The advice that MOSH must adopt the survey instrument set out in Appendix A to monitor behavior is also inappropriate.
- g) The instrument has not been shown to measure the particular behaviours required of Adopters (leaders, workers and stakeholders) for successful and sustainable adoption of MOSH leading practices.
- h) The instrument appears to have been developed to achieve the broad leadership and OHS culture goals of the Culture Transformation Framework as opposed to that of monitoring the behavior changes required for and/or arising from successful and sustainable adoption of MOSH leading practices.

p) RECOMMENDED WAYFORWARD FROM MOSH LEARNING HUB

In view of the detailed comments made on the draft research final report and the advisory note it is recommended that:

- a) Though the relevance and use of the instrument is uncertain it is recommended that the suggested leadership behavioural attributes and questions be corroborated with the Leadership Assessment Tool and the leadership behaviors identified in the 2008 Tripartite Action Plan aimed at addressing the OHS culture.
- b) A peer review be conducted on the research study by an independent behavior specialist, ideally with some in-depth understanding of behavior science.
- c) Ensure the development of behavior change measurement instrument or a combination of instruments to measure the behaviours of leaders, workers and stakeholders as may be verified with industry experts and which are arising from adoption of leading practices or are required to facilitate successful and sustainable adoption of leading practices.
- d) All the research study recommendations be drastically revisited and reviewed given the observations made in this document.
- e) The MHSC advisory note emanating from the draft research study report be drastically revisited and reviewed in line with observations given the observations made in this document.

STANFORD MALATJI

HEAD: MOSH LEARNING HUB