

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In chapter 1 it was pointed out that the South African mining industry provided the stimulus for the extensive development of an efficient physical infrastructure that contributed largely to the development of related secondary industries in the country (refer section 1.1). It played and still continues to play a valuable leadership role in many local and world wide safety and efficiency improvement projects. In recent years serious concern had been expressed with respect to the industry's deteriorating performance in growth, productivity, containment of cost, competitiveness and health and safety in general compared with that of prominent mining concerns in other countries (refer sections 1.2.9.1 and 1.2.9.7).

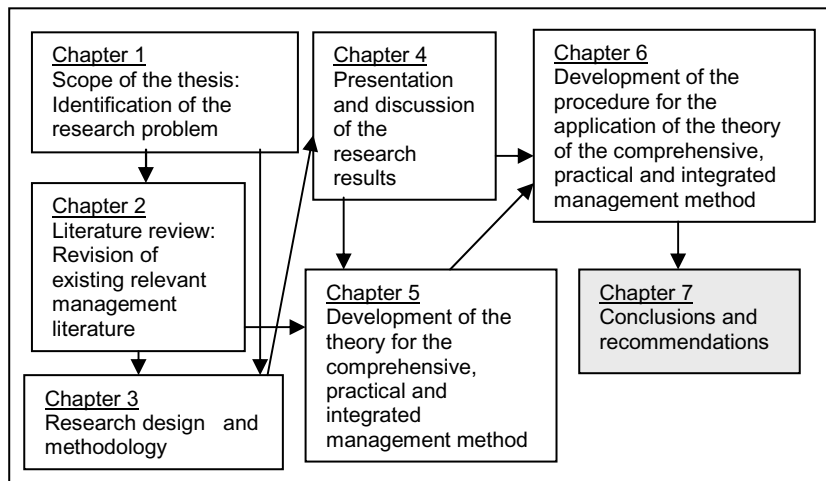


Figure 7.1: Chapter 7 in context to the overall thesis

The main reason for this mediocre performance was identified to be the lower than acceptable management competency in the mining industry. It was regarded as the major cause for the industry's unacceptable poor performance locally and globally (refer section 1.5.2.5, 2.8 and 4.4.15).

It was also proved that existing management practices were not sufficiently comprehensive to enable management to acquire the required managerial competency. It was incomplete and did not comply with the requirements of a comprehensive, practical and integrated management method, the logical classification of management work; a logical planning process and an industry-specific developed planning structure (refer section 2.2.1, 4.4.1, 5.5.4, 5.5.5, 5.6.1 and 5.6.2).

In chapter 5 the comprehensive and integrated management theory was developed. In chapter 6 the procedure to implement this theory was developed and proposed (refer section 5.4 and 6.2). The comprehensive, practical and integrated management theory together with the procedure constitutes the comprehensive, practical and integrated management method which was the topic of this thesis.

The method proved to be scientifically correct and easy to implement on all the levels of any organisation in the South African mining industry (refer section 6.2). It accumulates knowledge, requires competent application of the knowledge, accepts social responsibility, and exercises self-control. It is flexible, adaptable and promotes sound logical reasoning. It is expected to be totally acceptable by the mining community (refer section 2.4.10). This management method is believed to improve the managerial competency of all the mining employees to the proposed competency standard of 85 per cent and beyond (refer section 4.1).

In this chapter the salient features of the thesis would be summarised. An evaluation of the theory and the procedure would be presented. Recommendations to implement the comprehensive, practical and integrated management method in the practical situation would be proposed. Finally some management aspects for further research would be recommended.

7.2 RESEARCH RESULTS

7.2.1 Literature review

The review of the literature was discussed in chapter 2. The main objective was to establish whether a comprehensive, practical and integrated management theory and method could be ascertained from the literature. For the purpose of this thesis comprehensive was defined as inclusive or covering many things or a wide area. A comprehensive, practical and integrated management method, therefore was seen as a management method that would enable all employees, on all the levels, of any organisation to manage comprehensively for the achievement of the results required from them in all required aspects at all times. In section 2.2.1 the requirements of a comprehensive, practical and integrated management method was proposed as perceived at that stage. Evaluated against these perceived requirements it was concluded that existing literature and management practices had a number of deficiencies. The main conclusions arrived at from the literature review are discussed in the following sections.

7.2.1.1 The all-inclusive management theory

An all-inclusive management theory that would satisfy all the requirements of a comprehensive, practical and integrated management method could not be ascertained from existing management literature and practices. Such a theory therefore did not exist.

Various management authors and theorists confirmed this statement. The views of a number of the most prominent authors on management are briefly summarised below (refer section 1.3).

a) Drucker (1968:41) was of the opinion that:

- what it requires to run a business,
- what management is supposed to do, and
- how it should be doing it, have so far been neglected.

He published many highly valued books on management theory and principles and travelled extensively over the world in pursuit of the establishment of management principles and practices. He was honoured by the Harvard Business School as “The pre-eminent management thinker of our time” (refer section 1.3).

b) Allen (1973:46) argued that a relevant taxonomy or principles of classification would be required in order to meaningfully study management in an orderly and rational fashion. He argued further that the foundation for this had not been laid yet for management. According to him the following requirements would be indispensable to the progress of the management profession:

- a system for sorting, categorising, labelling, and defining new and old management information,
- a commonly understood classification of management work as a tool, and
- a taxonomy that would facilitate the communication and dissemination of new management knowledge and the basis for the logical definition of management terms.

c) Rue and Byars (1989:49) two of the more recent management authors argued that:

- some progress had been made in management development, and
- a unified theory of management had not been realised yet,

d) Callaway (1999:21) for example expressed the opinion that:

- it is in this quest for the one special management technique that will ensure success that had led to the seemingly never-ending supply of management theories,
- each of these, in their own way, contained a grain of truth, yet to date none provided all of the answers, and
- the various theories and techniques could be compared to a series of musical instruments. Each has a unique style and ability, but when taken together and used as part of a larger activity, they develop a synergy that transcends their individual contributions.

e) Drucker (2001:89), more recently after many more years in the management fraternity and the publishing of more valuable work on management, concluded that:

- what is needed is a redefinition of the scope of management, and
- management has to encompass the entire process.

f) Hellriegel et al (2005:8) in their 2005 'international student edition' argued that:

- the manager has to perform the four basic functions of management: planning, organising, leading and controlling – the basic principles of the administrative management approach developed during the 1880s by Henri Fayol, and
- their book was claimed to be totally designed on the most recent knowledge and views about the management discipline and proved, as Drucker and Callaway stated, that the one special management technique still did not exist.

7.2.1.2 Current management practices

A large number of management practices were proposed over time. Mostly a combination of these is currently applied in any one organisation at any one point in time.

- a) It would appear, however, that the administrative or process management approach developed by Fayol in the 1880s is still the one management approach that was predominantly being utilised by most management authors and practitioners (refer section 2.6.1). From the empirical research it was established that it is predominantly utilised by the South African mining industry (refer section 4.3.2). More recently Hellriegel et al (2005:8) and McDaniel and Gitman in 2008 published their books with the principles of the administrative management approach as the basis of their discussions.
- b) Existing management theory lacks a management logic or taxonomy for the logical sorting, categorising, labelling, and defining of new and old management information, as Allen termed it (refer section 2.6.2.8). The classification of the existing management theory is not based on a management logic that would allow the complete development of management work. The probability that the organising function, as it is known and applied today, should actually be one of the outcomes of the planning function was not realised, understood and admitted (refer section 5.5.4 and table 5.2). The leading and controlling functions are not really seen as time related functions or specific human skill categories that have to adapt to the development stages of the human race and advancement of technology.
- c) In chapter 2 existing management literature and practices were evaluated against the perceived requirements of a comprehensive, practical and integrated management method (refer section 2.2.1). It was established that with existing management literature and practices these requirements would not be completely met (refer section 2.8). The following were identified as the main deficiencies.
- It was impossible to integrate and coordinate the four functions of the administrative management approach in practice by all employees on all the levels of the organisation (refer section 2.8.1). A comprehensive, practical and integrated management method that complies with these requirements did not exist (refer section 1.5.1, 2.8.1 and 2.8.3),

- Existing management theories individually or combined appeared to be inadequate to develop the theory for a comprehensive, practical and integrated management method (refer section 1.5.2.2, 2.8.4, 5.3.8 and table 5.1).
- The managerial competencies of management are unacceptably low. It would appear that some components of the existing management theories and practices could totally or to some extent or in combinations be modified and utilised to develop the theory for a comprehensive, practical and integrated management method (refer section 1.5.2.6 and table 5.1).
- Existing planning processes and structures are totally inadequate to enable management to plan comprehensively on an integrated basis on all the levels of the organisation (refer section 1.5.2.3, 2.8.5, 5.6.1 and 5.6.2),
- Existing management practices are inadequate to enable managers and employees to comprehensively perform the steps as set out in section 2.8.8 (refer section 2.8.8.1 to 2.8.8.26). It would also be impossible to efficiently perform the tasks of the managerial skills (refer section 2.8.10.1 to 2.8.10.11).
- The additional required management theory to develop a comprehensive, practical and integrated management method and procedure to implement it was developed in chapters 5 and 6 (refer section 1.5.2.7, 5.4 and 6.2).

7.2.2 Empirical research

7.2.2.1 The research design

The required data was developed in order to enable the researcher to:

- investigate,
- analyse,
- evaluate the state of existing management practices, planning processes, management deficiencies, the knowledge and competencies of management, and
- evaluate the efficiency of the Mine Manager's Certificate of Competency (MMCoC) and the general management qualification in the mining industry with respect to the requirements of the comprehensive, practical and integrated management method (refer section 2.2.1 and 2.8).

The gathering of the data concentrated mainly on the eight mineral sectors that constituted the main business of the South African mining industry (refer section 1.2.4, 3.6 and table 1.1). The responses from the other mineral sectors were grouped under the category 'other'. The sampling covered the geographical areas of the Western Cape Province, Northern Cape Province, Free State Province, North Western Province, Limpopo Province, Gauteng Province, Mpumalanga Province and the Kwa-Zulu Natal Province of the Republic of South Africa. From previous research it was experienced that respondents generally were inclined to rate their managerial knowledge and competencies much higher than what they actually were (refer section 4.4.15, 4.4.16 and 4.4.2.17). Because of this probability a purposive sample was designed and applied on the total sample population whilst the

simple random sample design was designed and applied on a random selected number of the sample population (refer section 3.7.1 and 3.7.2).

Two questionnaires, consisting of 30 questions each were designed and used. One questionnaire was for the management members who were the holders of the Mine Manager's Certificate of Competency and the other one for the graduated managers (refer section 3.8.2 and appendices 7 and 8).

The assessments of these selected random population respondents were discussed with each separately in order to establish a more realistic assessment. The difference, expressed as a percentage, between the respondents' and the researcher's assessments was accepted as representative of the managerial competency gap of the sample.

The management levels were selected because:

- the population was available,
- the potential respondents generally have access to electronic communication media,
- each potential respondent had to succeed specific prescribed management training,
- each potential respondent was or was exposed to management responsibilities, and
- it would be more practical to contact respondents where and when required.

Of these respondents it was required to indicate to what extent the management theory of the Mine Manager's Certificate of Competency, enabled them to efficiently perform the management work required in their managerial positions. Each respondent had to indicate whether or not the management approach that he and the mine utilised mainly consists of the management functions of planning, organising, leading and controlling, and briefly specify and describe the approach that he and the mine utilises in the event that the approach specified above was not utilised. The assessment scale proposed in section 3.8.3.1 was utilised (refer section 3.8.2.1 and 3.8.2.2).

As the questions and responses were expected to be to a large extent subjective it was deemed more practical to make use of an assessment scale that could most efficiently accommodate subjectivity. The proposed scale was designed to be easy to use and to enable the researcher to arrive at acceptable reliable conclusions and judgments (refer section 3.8.3).

In order to test the suitability of these questionnaires a pilot study was carried out. A number of member names were selected at random and used in the pilot study. A return rate of 77.8 per cent was achieved. This rate was deemed to be acceptable (refer section 3.8.5 and table 3.2). The questionnaires were therefore used in the study. In order to facilitate the evaluation procedure relevant assessment criteria were suggested for each question during the personal discussions (refer section 3.8.7.1 and table 3.3). The criteria were used by the researcher to conduct a meaningful and structured interview with each selected respondent. This procedure ensured a more reliable, uniform and representative and meaningful assessment of the respondent's understanding of a comprehensive, practical and integrated management theory

Out of a total number of 135 criteria 80 criteria were with respect to the planning function (refer table 3.4). It confirmed that the criteria of the planning function (59.26 %) comprised the majority of the criteria of the four management functions. This indicated to what extent the planning function formed part of management work at present (refer section 2.6.2.1 and table 3.3 and 3.4).

Since the method of e-mailing questionnaires was considered to be cheap, fast, reliable, facilitating the electronic processing of the completed questionnaires and the acceptable statistical analysis and evaluation of the data it was used (refer section 3.9.2). It would in addition enhance the quick clarification of possible ambiguities and queries with regard to specific questions (Kothari, 1990:22). The questionnaires were e-mailed to all available registered members of the South African Colliery Managers Association, Association of Mine Managers of South Africa and the Northern Cape Mine Managers Association.

For purposes of assessment a competency standard of 85 per cent was proposed. Management competency was defined as the degree of proficiency of any employee in understanding and applying the perceived comprehensive, practical and integrated management theory in his own practical work situation.

7.2.2.2 The research results

Out of the 245 questionnaires e-mailed a total of 164 (66.94 per cent) responses were received within the planned period of October 2004 to April 2005 (refer table 4.1). From these responses the following specific deficiencies and suggestions with respect to existing management practices being utilised in the South African mining industry were raised (refer section 4.2).

a) Management programs

The general responses were that:

- Management endeavoured to accommodate managerial needs mainly by short duration, single-topic management programs of which many were not entirely based on management theory, not practical to implement and caused considerable confusion and resistance by the employees.
- These programs were not comprehensive and were mostly intended for line management only.
- The administrative management approach was not comprehensive and practically applicable as a comprehensive, practical and integrated management method.

b) Management planning

The main deficiencies with existing management planning practices, processes and structures were that they were not complete, logical, integrated and comprehensive enough with the results that:

- Comprehensive management planning practices, processes and structures did not exist,

- Very few of the employees in the organisation were involved in the planning of the results required from each of them.
- Insufficient time and method studies and logical step by step breakdown and analyses of work tasks were performed by the responsible employees in any of the mining organisations.
- Workers were not trained and allowed to set the standards applicable to their own work themselves. Performance standards for employees were normally set by top management and the technical departments.
- Budgets were mostly updated and escalated versions from the previous year with the result that employees did not sufficiently know and understand the objectives and results required from each of them.
- Risk assessments were performed by a separate dedicated department, mostly on an ad hoc basis or because of special requests.

c) Management organising

The main deficiencies with management organising were that:

- Organisational structures could not be scientifically designed because a logical scientific theory and method to develop organisational structures did not exist with the result that existing organisational structures were mainly carry-overs from other similar organisations.
- It was not possible to develop job descriptions correctly with existing management approaches with the result that relationships were inadequately determined and developed. It was almost impossible to delegate efficiently.
- Very few employees understood what coordination meant, what it implied and how it should be affected.

d) Management leading

The main deficiencies with management leading were that:

- Existing management practices largely ignored leadership theories because leadership programs were presented on an ad hoc basis only,
- As a result of the incomplete organisational development communication, delegation, motivation and decision-making were inadequate.

e) Management controlling

The main deficiencies with management controlling were that:

- Performance levels were seldom established and the performance standards were determined for each level of the organisation by dedicated staff departments from the top down.
- Management seldom controlled by exception, however, physical controlling methods on the lower levels were strict and generally regarded as of a high standard.

f) The Mine Managers' Certificate of Competency

The main deficiencies with the Mine Manager's Certificate of Competency were that it:

- Was out dated and too technically orientated.
- Did not cover the management and human resources theories adequately.

g) Suggestions proposed by the respondents

The following main suggestions were proposed by the respondents:

- Update the present Mine Manager's Certificate of Competency.
- Introduce a comprehensive, practical and integrated management method that would fully empower each employee on each level of the organisation to plan, implement and control the work necessary for the results required from him.
- Introduce management development programs for all employees on all the levels of the organisation and develop and maintain the managerial competencies of all the employees on all the levels of the organisation.

h) Conclusions arrived at by the researcher during and after the discussions

The researcher arrived at the following conclusions:

- The administrative management approach was supported by 96.34 per cent of the respondents. It appeared to be the management approach predominantly being utilised by the mining industry (refer section 4.3.2).
- A comprehensive, practical and integrated management method did not exist in the South African mining industry with the result that planning was not performed on a comprehensive company wide basis according to a specific planning process with all employees fully involved. Action plans could not be adequately integrated and coordinated. Comprehensive efficient planning procedures involving all the employees from the executive level to the worker level on the mines did not exist. Communication, reporting and controlling were in most cases totally inadequate.
- Organisational structures could not be designed and developed scientifically with the existing management practices with the result that delegation of responsibilities and authority were normally inefficiently performed.
- Work flows were seldom performed. Alternative methods to achieve planned results were rarely determined and developed and the best alternative was basically never selected and implemented especially at the lower levels.
- Performance standards as well as risk assessments, mainly for the operational levels, were set and performed by a dedicated staff department from the top down.
- Leading is totally inadequate and is raised as a problem area by all respondents.
- Top management mainly sets policies, procedures and regulations mostly without the necessary involvement of all the people affected by it.

- Job specifications could not be determined scientifically with existing management practices.
- Employees were mainly recruited, selected, appointed and trained by staff departments with no or limited involvement of the relevant supervisors.
- Training and development programs were mostly carry-overs from the past and in many instances not mine specific but general group developed programs.
- Existing management systems did not lend themselves to complete computerisation.

7.2.2.3 Evaluation of the sampling results

With the analysis and evaluation of the responses, comments and suggestions from the respondents and the observations by the researcher of the management practices in the mining industry it was established that:

- the administrative management approach was predominantly being utilised in the mining industry (refer section 4.3.2),
- a comprehensive, practical and integrated management method did not exist in the South African mining industry (refer section 2.8.2 and 4.4.2),
- the management practices and programs utilised in the industry were totally inadequate to enable the mining personnel to manage in a comprehensive, practical and integrated manner on all the levels of the organisation (refer section 4.2.2.1 (a) and 4.4.3),
- the Mine Manager's Certificate of Competency was largely outdated and should either be replaced with a comprehensive, practical and integrated management method or be updated (refer section 4.2.2.1 (f) and 4.4.4),
- the planning processes utilised were incomplete and could not enable management to plan comprehensively, practically and in an integrated manner (refer section 2.8.5, 4.2.2.1 (b) (ii) and 4.4.5),
- organisational structures and labour requirements were not scientifically developed and were, in most cases, carry-overs from the past and similar organisations (refer section 4.2.2.1 (c), 4.2.3.5 and 4.6),
- alternative methods and work were seldom developed into tasks with the consequence that the best alternative was not always selected and implemented especially at the lower levels (refer section 4.4.7),
- performance standards and risk assessments were set and performed mainly by staff personnel, who in most cases had inadequate knowledge and experience of the practical operations of the company (refer section 4.2.3.9 and 4.4.8),
- employees were normally told what results were required from them (refer section 4.2.3.4),
- policies, procedures and regulations were seldom instituted and when, mainly by top management (refer section 4.2.3.11 and 4.4.9),
- supervisors were seldom involved in the selection and appointment of their own subordinates. Employees were mainly recruited, selected appointed and trained by staff departments (refer section 4.2.3.14 and 4.2.3.15)),

- job specifications could not be determined scientifically (refer section 4.2.3.13),
- training and development programs were in many cases carry-overs from the past and were in many instances not mine specific but general group programs (refer section 4.2.3.18 and 4.4.14),
- the average measured competency gap of the respondents of the Mine Manager's Certificate of Competency was 62.62 per cent (refer section 4.3.10.1, 4.4.15, figure 4.15 and table 4.13),
- the average measured competency gap of the General Management respondents was 42.19 per cent (refer section 4.3.10.2, 4.4.16, figure 4.16 and table 4.14), and
- the average overall competency gap was 53.94 per cent (refer section 4.3.10.3, 4.4.17, figure 4.17 and table 4.15).

7.2.3 Development of the theory

7.2.3.1 The new developed theory

A management logic was developed in order to develop the new theory. The comprehensive management logic was based on the premises that management:

- is work,
- predetermines and achieves results,
- is a science and should comply with a specific logical reasoning,
- depends on specific principles of human and organisational needs and behaviour, and
- is a logical process aimed at satisfying specific needs (refer section 5.4 and 5.4.1).

It followed that for the most efficient management:

- performance results required, need to be stated first,
- thereafter the objective should be formulated, and
- then the work or the best method should be determined and efficiently performed.

In section 5.5 it was established that the best method to manage would be to:

- plan,
- implement the plan, and
- control the progress with the plan.

From this logic it followed that the:

- main results required must satisfy the main objective,
- results required for each main task must satisfy the objective of each main task,
- required results would become the standards of performance for that main task, and
- results of all the main tasks must add up to the main results required for the general objective. It must be the total of the results required from each main task.

The advantages of the new theory are that:

- it is possible to scientifically classify management work,
- it makes the development of technical work logical and simple,
- it facilitated the development of a logical integrated management planning process,
- a practical planning structure for the South African mining industry followed logically from it (refer figure 5.17),
- the planning process was applicable to each plan whether small or large or long or short term,
- it could be applied on all the levels of the organisation, and
- it recognised the reality of and the need for every employee to plan for the results required from him.

The systematic and logical development of the theory:

- facilitated the classification of management work,
- facilitated the development of a logical planning process,
- facilitated the logical development of a planning structure,
- established the logical application of management principles, and
- ensured efficient delegation.

7.2.3.2 The comprehensive management classification

The classification followed logically from the development of the comprehensive management logic work. The work flow of management work was proposed as a general approach to develop and analyse management work (refer figure 5.15 to 5.15 (c) and table 5.2). It could vary with the:

- strategy of the organisation,
- type of business,
- specific discipline, and
- reasoning capabilities of personnel.

7.2.3.3 The planning process

The proposed planning process was developed from the classification of the comprehensive management work (refer section 5.5.4, figure 5.15 to 5.15 (c) and table 5.2). The process closely followed the sequence of the development of the supporting and controlling tasks of the management main tasks to plan, to implement and to control the plan. From figure 5.17 it was clear that the development of each alternative, as indicated in red in the block, must be repeated in detail so that a more reasoned choice could be made as to which alternative method would be the best (refer section section 5.6.2).

The proposed planning process would enable management in the South African mining industry to:

- more accurately determine the required results for each employee,

- develop the objective for each employee, section, department and the company,
- integrate, align, coordinate and optimise objectives per employee, section, department and the organisation as a whole,
- develop the most probable alternative methods optimise the resources and performance,
- select the best method with which to realise these objectives,
- determine the necessary performance standards for each task,
- develop the work flow and task and resources for all work,
- effectively delegate, coordinate and integrate all work,
- establish control and corrective measures,
- timeously identify future risks, threats and opportunities,
- efficiently accommodate any foreseen and unforeseen changes and risks,
- computerise the total management method for each employee, level and the organisation as a whole,

7.2.3.4 The planning structure

The proposed planning structure was derived from the development of the work to manage (refer section 5.4 and table 5.2). The main advantages of the planning structure, are that it would:

- serve as an accurate core management control system,
- enhance the compilation for all work, employees, section, departments and the organisation as a whole,
- establish effective control for each task, employee, section, department and the organisation as a whole,
- direct the integrated action of all employees,
- enable the organisation to plan efficiently and systematically in order to detect all possible deficiencies, and

According to Daft (1995:511) the core control system consists of:

- all the different plans in the planning structure from the top to the bottom of the organisation, and
- the control systems of the various departments, sections and the organisation as a whole.

This planning structure would be easy to implement by every employee on every level of the organisation. Any required change in any of the results could easily be detected and accommodated throughout the entire organisation.

7.2.3.5 Development of alternative methods

As mentioned in this thesis there would normally be more than one method with which to achieve the specific desired results. It would be the duty of each employee to always develop possible alternatives, select the one best alternative from these and then develop it further. The alternative to

manage selected in chapter 5 was broken up into the main tasks to plan, to implement and to control the plan. It could also have been broken up into the main tasks to plan and to commission the plan (refer section 5.5.1). The main task to commission the plan could further be developed in the supporting tasks to implement the plan, to operate the plan and to control the plan. The complete development of both alternatives should eventually result in the same results. This reasoning demonstrates that there could be more than one method to achieve the required results. The employee should always develop alternative methods for each set of results required all the way down to the last set of results required. When developing the work flows each employee should keep this important requirement in mind. It would result in a lot of work but it would facilitate and enhance the development and optimising of the company's results

7.3 COMPARISON OF THE COMPREHENSIVE, PRACTICAL AND INTEGRATED MANAGEMENT METHOD WITH THE ADMINISTRATIVE MANAGEMENT APPROACH

Administrative management approach	Comprehensive, practical and integrated management method
1. See management as a process consisting of the four functions of planning, organising, leading and controlling (refer section 2.5.1.1 (d))	See management as a process consisting of the three main tasks to plan, implement and control
2. Not based on a specific logic (refer section 2.5.1.1 (d))	Is based on a specific logic (refer section 5.4.2)
3. No procedure to implement (refer section 2.5.1.1 (d))	Has a specific detailed procedure to implement (refer chapter 6)
4. Is not a comprehensive management method	Is a totally comprehensive management method
5. Has no logical management classification	Has a logical management classification
6. Has no specific logical planning process	Has a specific logical planning process
7. Is not possible to properly integrate and coordinate	Can be totally integrated and coordinated
8. Can not logically be developed down to the last level	Can be logically developed down to the last level
9. Is time consuming and not possible to adjust for the total organisation on all the levels and perform what-if scenarios	Is quick to adjust for the total organisation and to perform what-if scenarios
10 Not practically suitable for total computerisation	Is ideally suited for total computerisation
11. Impossible to efficiently implement and apply for the the total organisation	Easy to implement and apply for the total organisation
12. Provides little directives as to where and when to apply management skills such as communication, motivation, decisionmaking, etc	Clearly states that the method requires that these skills being applied where and when necessary

Table 7.2: Evaluation of existing management practices and the comprehensive, practical and integrated management method

From the comparison below it would appear that much of the administrative management approach forms part of the comprehensive management logic. It is also clear that the administrative management approach is not a comprehensive management approach in the aspects outlined above. It can not entirely support a comprehensive management method.

7.4 RECOMMENDATIONS

7.4.1 Recommendations with specific reference to the South African mining industry

The average overall managerial knowledge and competency gap of 55.94 per cent of management in the mining industry in general was unacceptably high (refer section 4.3.10 3, 4.4.14, 4.4.17, figure 4.17 and table 4.15). It is logical that the reduction of this gap would tremendously improve the performance of the industry. Existing available management practices proved to be inadequate to enable the industry to manage in a comprehensive, practical and integrated manner (refer section 2.8 and 4.4.3). This deficiency is considered to be the main reason for the industry's unacceptable production and, safety performance and deteriorating global competitiveness.

The management component of the Mine Manager's Certificate of Competency syllabus is proved to be totally inadequate to enable mine managers to manage comprehensively (refer section 4.4.15). Serious management deficiencies with respect to the planning and organising functions of management were identified mainly because the existing management theories do not provide the necessary theoretical bases for the efficient execution of these functions. The existing planning processes, proposed by the various authors on management principles and supported and being utilised by the majority of management practitioners in the mining industry, proved to be inadequate to comply with the requirements of a comprehensive, practical and integrated management method (refer section 2.2.1, 4.4.3, figure 5.17 and table 2.4).

It is recommended that the industry thoroughly study the conclusions and recommendations proposed in this thesis with a view to:

- 7.4.1.1 evaluate the proposed theory and procedure,
- 7.4.1.2 consider an industry representative competency survey in order to determine the state of the management competencies on all the levels in the industry,
- 7.4.1.3 consider a comprehensive global industry-wide survey with respect to the existing management practices presently being utilised in the global mining industry,
- 7.4.1.4 evaluate the potential contribution of these practices to the realisation of the stated desire of the South African mining industry to once again become the leader in the world mining arena,
- 7.4.1.5 implement the comprehensive, practical and integrated management method in the industry, and
- 7.4.1.6 in the process of implementing the method do it on a planned and controlled basis, involving all the stakeholders in the industry (refer section 6.4).

7.4 2 Recommendations for further research

Although the comprehensive, practical and integrated management method was proposed as the one best management method constraints such as volume and time limited the detailed development of all the relevant management aspects in this thesis. The topic of this thesis was to develop a comprehensive management method that would solve all the identified deficiencies of existing management practices utilised in the South African mining industry. The author concentrated on the development of this management method.

The following management work within the proposed theory and procedure should, for the sake of completeness be researched in more detail:

7.4.1 Planning on a comprehensive, practical and integrated basis.

7.4.2 Development of organisational structures.

7.4.3 The place and utilisation of people aspects such as:

7.4.3.1 decisionmaking,

7.4.3.2 communication,

7.4.3.3 motivation,

7.4.3.4 coordination,

7.4.3.5 integration, and

7.4.3.6 delegation.

7.4.4 Controlling on a comprehensive and integrated basis, and

7.4.5 Development of an intrinsic coding system for the implementation and management of the comprehensive, practical and integrated management method.

7.5. CONCLUSION

It was proved in this thesis that existing management practices are inadequate. As a result the South African mining industry can not optimise the available scarce resources at its disposal in order to realise its objectives. The comprehensive, practical and integrated management method was developed and proposed in this thesis as the solution to the industry's managerial problems. This management method would be relative easy to comprehend and implement on all the levels of the South African mining industry.

It is proposed that the leaders in the South African mining industry seriously consider the recommendations proposed in section 7.4 of this chapter. The conscientious application of this management method would enable the industry to regain its former leading position in the global mining arena and to stay in that position. Its ability to increase production, safety and cost performance would increase and more job opportunities would be created with the added advantage to the communities and the country as a whole.