ISO 9001:2008 based quality Management System's design and Development for the Drill Rig Manufacturing Workshop of Triple "M" Mining.

By

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Executive summary

MMM Mining is a mining company that supplies goods and services to the mining industry. One of the major sections of the company is the manufacturing of drill rigs which are used for safe mining underground. A dedicated new workshop for the production of drill rigs is situated at Mooinooi. Due to the rapid expansion of the target industry of MMM Mining has grown to supply not only the Swartklip region but also regions all around South Africa with drill rigs. The rapid expansion is also due to the increasing need for health and safety within the mining industry. Management now experiences the need for the implementation of a quality management system, to keep their contracts with the mining industry.

This aim is to design and implement a quality management system that will conform to the requirements of ISO 9001:2008(E). The management system will assist the management of MMM Mining in the operation of daily processes and ensure a high grade product which will meet customer demands. This quality system will ensure that the products manufactured at Mooinooi are of the highest quality. It will strive to meet the following documentation requirements as set out in the ISO 9001:2008(E) standard:

- Documented statements of a quality policy and objectives.
- A quality manual.
- Documented procedures required by ISO.

The correct use of this quality system will have a positive effect on all operations and processes. A QMS is a necessity for any business and provides a basis for all business operations. In addition a QMS will decrease waste material and defective products thus increasing profit and quality.

Triple "M" Mining (Pty) Ltd

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1. Introduction

1.1 Company background

Triple “M” Mining (MMM Mining) was formed in August 2001. In the early years the company concentrated solely on mining and removal of rubble from the mines, however, as the mining industry in and around Swartklip expanded MMM Mining recognized an opportunity for growth. MMM Mining serves a wide range of industries, with emphasis on platinum and gold sectors, not only within close proximity, but as far as Rustenburg, Northam and Welkom.
The scope of the operations of MMM Mining involves the following specialized divisions:

- Sinking
- Mechanized Mining
- Conventional Mining
- Sweeping & vamping
- Equipping & Construction
- Reclamation
- Ventilation Construction

The operations are backed by well trained and specialized personnel. MMM Mining wholeheartedly subscribes to implement Black Empowerment principles, and strive to secure their future by pro-actively uplifting, training and motivating their employees. The company grew from a small business with only a few partners to, a company with more than 6000 employees working underground, one of ABSA’s top 5 clients and one of Anglo American’s top 100 suppliers.

Clients of MMM Mining include:

- ANGLO PLATINUM
- LONMAN
- HARMONY

1.2 Project background

The new Drill Rig Manufacturing Workshop (DRMW) at Mooinooi that produces drill rigs, which are used in platinum mines. MMM Mining has a wide range of operations at the Mooinooi workshop namely:

- Cutting
- Welding
- Drilling
- Painting
- Assembling
- Inspection

Quality and conformity to specifications is an absolute necessity at all of these operations. The project for the design and implementation of a suitable Quality Management System (QMS) was selected. Another reason for the design and implementation of a quality system is the continuous pressure from mines to have a suitable quality system.

MMM Mining has been expanding beyond expectation as the mining industry expanded in the last 8 years. As the mines became more aware of health and safety MMM Mining introduced the drill rig which allows the worker to drill while being a safe distance away from the wall which they are drilling into. It was also more economical for the mines because the drill rigs work at a faster rate than the conventional drills. Since the popularity for the drill rigs have increased exponentially over the last few years so did the need for a larger workshop. The company has no quality management system for the drill rigs itself as well as the current and new drill rig workshop and thus arrive the need for a quality management system. Such a system should set documentation in place that describes the various business procedures and steps that an individual should follow in carrying out these procedures. The new work environment will encourage the employees to be part of the change.

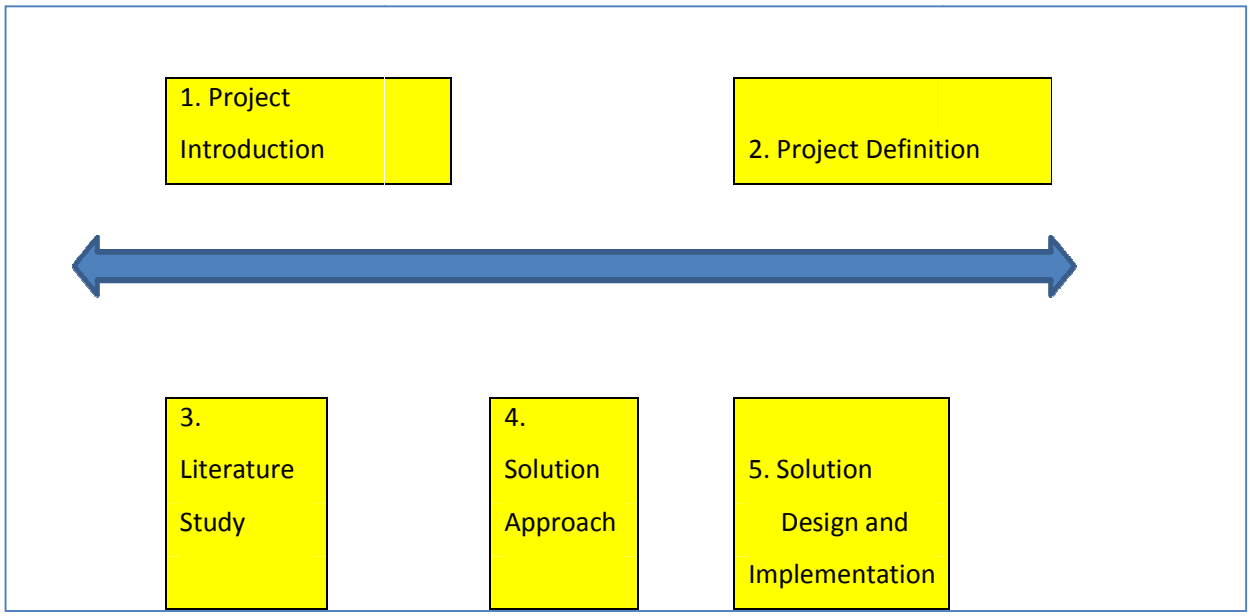
The drill rigs manufactured by MMM Mining has to be made to exact specifications. A small deviation in any of the components may cause the machine to breakdown which can cause the

client to suffer loses or prove to be fatal to the employee. In other words quality products is an absolute necessity for MMM Mining. The current inspections are very time consuming and delays the production line in some cases and no records of these are kept. These previously mentioned records could be helpful in the process of eliminating recurring problems in manufacturing. Inspection methods are not adequate at all stages in the production line. Job changeovers are difficult seeing that no precise documented procedures for various operations in the business are in place. Currently there is no traceability on the products, it is also difficult to trace back to the origin of a non-conformance of a defective product. The implementation of a QMS will create opportunities to save time and resources by having less rework done on products and less scrapped products.

1.3 *Document Structure*

The document describes the details of the entire project and depicts all the phases involved in the project. The project is divided into five main sections that can be viewed in the figure below:

Figure 1: Document Structure



2. Problem Statement

MMM Mining identified the need for a quality management system which will ensure the quality of the drill rigs, as well as to ensure that their products can be tracked throughout the system.

2.1 Project aim

The aim of this project is to design and implement a quality management system (QMS) that will ensure that MMM Mining drill rigs meets customer requirements in terms of quality and assist in the ongoing control of processes within the system of processes. The QMS will be designed to comply with the standards set out in the International Standards for quality management systems (ISO 9001:2008). The QMS will also provide the employees with detailed procedures to follow in production. Thorough inspections will be set in place at the required stations to assist in the quality assurance process. Records of inspection will assist MMM Mining in eliminating problems occurring in the in the workshop and thus decreasing defective products. In order to track drill rigs through the production line an appropriate tracking system will be installed.

2.2 Project scope

This project will focus on the drill rig workshop at Mooinooi and the processes incorporated in the management thereof as well as the layout if time permits. Due to the restriction in time to complete the project, only the following documentation requirements and procedure implementation of International Standard will be met:

- Documented statements of a quality policy and objectives.
- A quality manual.
- Documented procedures required by ISO.

All procedures which are required in day to day production of the business will be set in place and documented according to ISO standards. An appropriate product tracing system and inspection will also be implemented.

2.3 Project deliverables

A quality management system for MMM Mining which will result in the following:

- More effective and efficient operations.
- Improved employee morale and awareness.
- Improved communication between departments.
- Ensured product quality.
- Reduced waste.
- Increased profit.
- Improved customer satisfaction.
- Improved inspection methods.

2.4 Project constraints

While the student did the project at MMM Mining a few constraints were encountered. The constraints included the following:

- Time was the main constraint since the project forms part of the student's final year at the University of Pretoria and has to go to class as well as do the project.

- The experience of the student is also a constraint as his experience is still limited to only a few projects done in his vacation work.

- The budget of the QMS was limited and therefore the student developed the procedures and templates personally.

- The student experienced that the employees at Mooinooi didn't want a change in the way they operate, introduced by QMS.

3. Budget

Budget for quality system for MMM Mining.	
Labor @ R 250,00 per hour for 200 hours	R 50000,00
Transport expense @ R 200,00 per trip for 15 trips	R 3000,00
Printing Expenses	R 400,00
Total Expenses	R 53400,00

4. Literature study

4.1 Purpose of a literature study

According to Cooper, H. M. (1989) '… a literature review uses as its database reports of primary or original scholarships, and does not report new primary scholarship itself. The primary reports used in the literature may be verbal, but in the vast majority of cases reports are written documents. The types of scholarship may be empirical, theoretical, critical/analytic, or methodological in nature. Second a literature review seeks to describe, summarize, evaluate, clarify and/or the content of primary reports.'

The first step in starting a project is to gather information from various sources which will assist you in the project, briefly called a literature study. A literature study will enable the student to get a broad knowledge in the specific area of study in a short time. The engineering industry requires an engineer to be knowledgeable in the field of the project which he/she is taking on. The following research methods can be used to obtain knowledge on a project:

- Observations
- Internet
- Library
- Studies
- Discussions/Interviews

By using these methods, methodologies can be obtained and investigated to find a problem/project similar to the problem/project which needs to be solved. Investigating similar problems and solutions of previous projects conducted will enable the student to see where errors were made and to eliminate those errors. By investigating all possible solutions the student can with confidence apply the best solution to the problem.

4.2 Research methods

During the company analysis phase the student made use of various data collection techniques to investigate the problems in the company. The student interviewed a few of the staff members and the owner to get a clear view of the problem which need to be dealt with.

The student also did research using the internet and the library to get relevant information on quality management systems and how to implement it.

Furthermore the student went to various departments of the company to understand how processes are done and to see where there is a need for improvement. While these observations were being made the student conducted conversations with the workers which led to the discovery of problems which these workers encountered on a regular basis.

The need for a quality management system was identified after an extensive period of time and observations.

4.3 Rationale for quality management systems

Quality management systems can assist organizations in enhancing customer satisfaction. Customers require products with characteristics which will satisfy their needs and expectations. Customer requirements specify the needs and expectations of the customer for the specific product in terms of product specifications. Customer requirements may be specified by the organization itself or contractually by the customer themselves. The acceptability of the product is ultimately determined by the customer. Organizations are driven to continually improve their products and processes as customer needs and expectations are ever changing.

The quality management system approach encourages organizations to analyze customer requirements, define the process which contributes the achievement of the product which is acceptable to the customer, as well as keep the processes in control. The framework for continual improvement to increase the probability of enhancing customer satisfaction can be met by implementing a quality management system. A quality management system also

provides confidence to the organization and to its customers that it will provide products of a high quality and of the specific requirement.

4.4 Literature on the ISO 9000 family of standards

ISO is a worldwide federation of national standards bodies (ISO member bodies). The international organization of standards (ISO) develops voluntary technical standards which add value to business operations. The ISO technical committee normally prepares the international standards. ISO is a world renowned organization which contributes to making the development, manufacture and supply of products and services more safe and to a higher standard.

ISO 9001:2008 QMS is a quality management system that conforms to the requirements of the standard. According to ISO a management system can be defined as follows: 'A QMS is the way an organization directs and controls those business activities which are associated with quality'.

4.4.1 Why the ISO 9000 family was created

The development of an internationally recognized quality management system was becoming more and more apparent because of the increase in international trade. The fear that a variety of different national standards would be a barrier to international trade then came to light. The increase in international trade was caused by the revolution in transportation methods, which lead to that large amounts of goods could be transported to anywhere at a low cost. This meant companies had a larger choice in whose products to choose in terms of price and quality. By the mid-sixties a demand, not only a desire, for international standards had developed. The sources of this demand included standards institutions in developing countries, multinational companies and government regulatory bodies. To overcome the fear of various standards the ISO technical committee (TC) 176, Quality management and quality assurance, was established in 1979.

The first standard to be issued was ISO 8402 it was issued by ISO/TC 176 in 1986. This standard standardized the terminology for quality management. This standard was shortly followed by ISO 9001, ISO 9002 and ISO 9003 in 1987. These standards provided the requirements for quality management systems (QMS) operated by organizations with a varying

scope of activity. The standard was created for organizations with service, maintenance and R&D functions. ISO 9004 were created to provide guidance on quality management and completed the ISO 9000 series.

The new ISO 9000 standards are based on a process approach with the focus shifting from complying with needs to achieving results. Objectives laid down by customers can be met by using standards. Standards also help to make an organization more effective and efficient.

4.4.2 This international standard is applicable to the following:

- Organizations seeking advantage from implementing a quality management system.
- Organizations seeking confidence from their suppliers that their product requirements will be met.
- The users of the products.
- Developers of related standards
- Those who is concerned with a mutual understanding of the terminology used in quality management.
- Those internal and external to the organization who assess the quality management system or audit it for conformity with the requirements of ISO.
- Those internal or external to the organization who gives advice or training on the quality management system.

4.4.3 The ISO family of standards

The ISO family of standards which is listed below has been developed to assist all types and sizes of organizations, to implement and operate effective quality management systems.

- ISO 9000 describes the fundamentals of quality management systems and specifies the terminology for quality management systems.

- ISO 9001 specifies the requirements for a quality management system where the organization needs to show its ability to provide products which meets customer and applicable regulatory requirements and aims to enhance customer satisfaction.

- ISO 9004 provides guidelines which consider the effectiveness and efficiency of the quality management system. The standard aims to improve the performance of the organization and to enhance customer satisfaction.

- ISO 19011 provides guidance on quality and environmental management systems auditing.

These standards form a coherent set of quality management system standards facilitating mutual understanding in national as well as international trade.

4.4.4 Basic quality management principles of ISO

The eight quality management principles listed below form the basis for the quality management system standards within the ISO 9000 family.

- **Focus on the customer**
  Organizations depend on customers for their survival and therefore should understand current and future customer needs, meet customer requirements and strive to exceed customer expectations.

- **Leadership**
  Unity of purpose and direction in the organization are established by leaders. Leaders should also create and maintain the internal environment in which workers can become fully involved in achieving the organizations objectives.

- **Involvement of people**
  People at all levels are of the essence to an organization and their full involvement enables them to be used for the benefit of the organization.

- **Process approach**
  A desired result is achieved more efficiently when related resources and activities are managed as a process.

- **System approach to management**
  The organization's effectiveness and efficiency in achieving objectives is promoted by identifying, understanding and managing interrelated processes as a system.

- **Continual improvement**
  A permanent objective of the organization should be the continual improvement of the organizations overall performance.

- **Factual approach to decision making**
  Analysis of data and information can lead to effective decisions.

- **Mutually beneficial relationships**
  An organization and its suppliers are interdependent, and a mutually beneficial relationship enhances the ability of both to create value.

4.4.5 Benefits of implementing an ISO 9001:2008 QMS

When an ISO 9001:2008 QMS is implemented and managed correctly the following benefits listed below can be obtained:

- Enhanced customer satisfaction
- Consistent outputs
- Improved business performance and productivity
- Focus on customer expectations and business objectives
- Confidence that the target quality is achieved and maintained
- Decreased number of defects
- Earlier detection of non-conformances
- Constant quality measurements
- When non-conformances occur there are procedures in place to ensure corrective action is taken.

4.4.6 ISO 9001:2008 design and implementation steps

Described in the following section are the design and implementation steps for an effective quality management system, adhering to the requirements set out by the ISO 9001:2008 standard:

1. **Analyze current operations**
    - Site visits
    - Employee interviews
    - Work instructions
    - Design specifications and customer requirements

2. **Identification of ISO 9001:2008 requirements as stated in the ISO 9001:2008 standards**
    - Identify the procedures needed for the quality management system and their application throughout the organization.
    - Identify the documentation requirements set out in the international standard.

3. **Identify existing procedures**
    - Establish if documentation of processes exists.
    - View and evaluate documents.

4. **Identify additional procedures which are required**
    - Identify additional procedures which are necessary to comply with the ISO 9001:2008 standard.

5. **Develop and alter required procedures**
    - Additional procedures needed must be developed.
    - Alter existing procedures and documentation to comply with the ISO 9001:2008 standard.

6. **Implement procedures**
    - Implement all the required procedures.

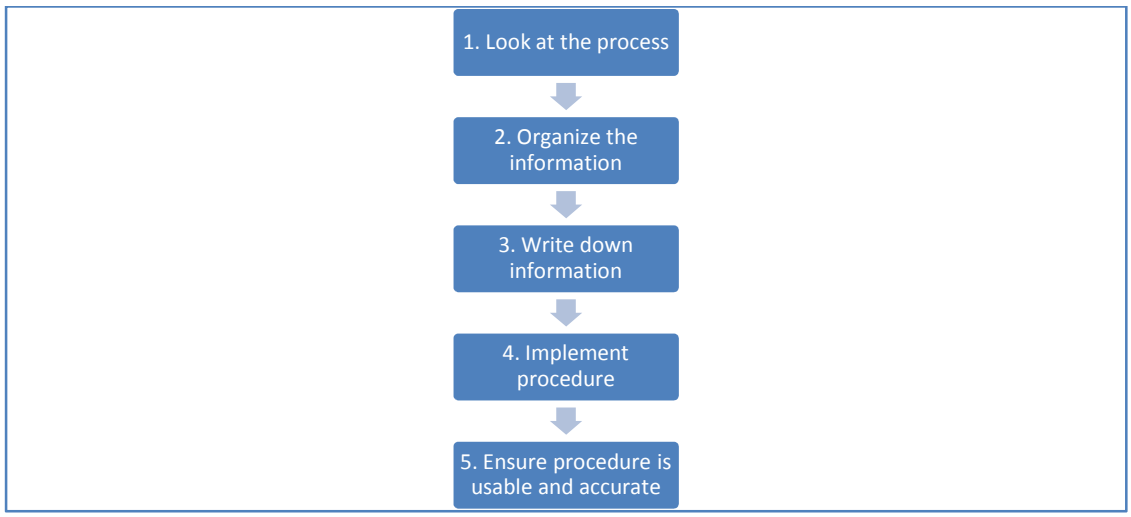
7. **Maintain and continually improve**
    - Inspect procedures regularly for conformance and continually improve these procedures.

4.4.7 Literature on procedure writing

The main requirement of ISO 9001:2008 is the writing of procedures. According to Dr John Robert Dew'…procedures play an important role in safeguarding quality, environmental and health and safety problems.' The 5 ground rules for developing effective procedures as stated by Dr John Robert:

- Procedures should be made short and to the point.
- Write procedures with the customer in mind, not expert.
- Develop procedures which are easy to read and understand under stress.
- Use a simple identification and numbering system.
- Place procedure at an appropriate location for the user.

Figure 2: Steps for procedure writing



4.4.8 Conclusion from literature on QMS

The ISO 9000 family of standards were studied during the literature study phase of this project. This management system showed benefits of increased performance, productivity, customer satisfaction and better control over processes in the organization. ISO 9001:2008 is n compliance to the world standards in quality. ISO 9001:2008 is also the most popular management system, which will improve the company's image and lead to savings in all aspects of the business. The ISO 9001:2008 requirements are stated clearly in the standard and appeal to the management and customer base of the company.

4.5 Literature on product conformance

The conformance of the drill rigs to the customer's requirements is a very important aspect. The drill rigs are used in mines below the surface. When there is a non-conformance it can cause the drill rig to break down which costs the mines and Triple "M" Mining a lost in income and of time.

When this happens a technician has to be sent down to look at the problem and analyze it. If the problem is not to critical the technician can fix the problem after he receives the parts required from Triple "M" Mining. But if it is a large problem the drill rig must be sent back to Triple "M" Mining for repairs and in that case Triple "M" Mining needs to send them a new one for that period of time.

4.5.1 Inspection requirements

The production line consists of the following stations:

- Receiving of materials
- Cutting station
- Welding station
- Drilling station
- Painting
- Assembling station
- Loading station

After every main function in the workshop interim inspections need to be conducted, by doing these inspections a non-conformance can be eliminated early in the process and be reworked or scrapped. This saves money and time for the organization. A final inspection will be conducted at the loading station.

4.5.2 Inspection methods

Throughout the workshop there is a need for various inspection methods. In selecting an appropriate inspection method for a process the least time consuming but effective method should be implemented. As the longer the inspection takes the lower the productivity and the longer the cycle time of the process which will decrease profit. The available inspection methods are:

- **Direct visual inspection**

  Obvious non-conformances can be spotted by using this kind of inspection method in all areas of the organization. This is also the quickest method and should be used where it is sufficient.

- **Physical inspection by measurement**

  Measurement will also play a large role in the inspection of the drill rigs. This is because if there is to large offset in tolerances the assembling of the rig is difficult and sometimes impossible. Measurements are made using a measuring tape and for the finer parts a vernier-caliber should be used. Records of the measurements should be kept for future use.

- **Equipment inspections**

  The inspection of machines in the workshop is also a very important aspect of the system. These inspections will be conducted using various techniques. Small mechanical or setting problems which can cause non-conformances can be eliminated by doing these inspections. This will also increase the productivity levels as there will be less breakdowns and non-conformances. To assist the workshop mechanic in performing these inspections a maintenance schedule should be implemented.

- **Physical measurement using jigs and templates**

  Templates can be made for each station to the exact size of the various components which need to be machined. These templates can then be placed at the various workstations to show conforming and nonconforming sizes. This will be difficult as various types of parts are being machined at every station. A fixture is defined to be a means through which a part is securely fastened to the machine tool table to accurately locate, support and hold the part during machine operation.

- **Go-NoGo gauges**

  A Go-NoGo gauge can be used in the production line to check a part against allowed tolerances. A Go-NoGo gauge just tells you whether the part is acceptable or not. This is a very suitable inspection method in a workshop as a very low level of skill is required to use it.

4.5.3 Benefits of inspection

A requirement set out in the international standard is the implementation of quality inspections. Implementing an appropriate inspection method can have the following benefits:

- Enhanced customer satisfaction
- Reduces scrap and rework that needs to be done
- Product throughput rate will increase
- Non-conforming parts can be detected early
- Workers will develop more skills
- Areas for human error will be removed

4.5.4 Inspection implementation steps

1. **Research inspection methods**

   Investigate suitable inspection methods for the applicable manufacturing activity.

2. **Select appropriate inspection method**

   Select the inspection method which fits the activity best.

3. **Train the workforce to use the method**

   Attain the equipment needed for the inspection and train the workers how to use it correctly.

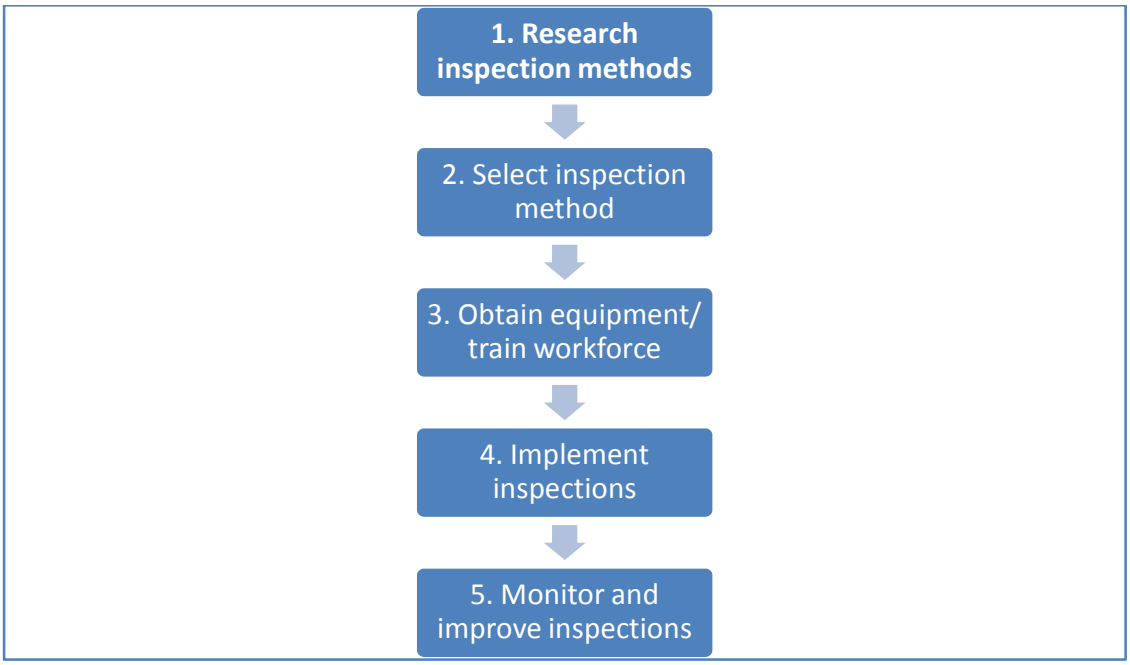
4. **Implement inspection**

   Implement the selected inspection methods at the various workstations.

5. **Monitor and improve inspection**

   Monitor the inspection methods and search for improved inspection methods where needed.

Figure 3: Inspection implementation steps



4.5.5 Conclusion from literature on inspection

In all business operations inspection is a necessity. Various inspection methods can be applied in Triple "M" Mining to decrease the number of non-conformances in activities. The aim of inspections is to reduce the number of non-conforming products in the production line, which will increase productivity.

5. Conclusion on IS0 9001:2008

By implementing ISO 9001:2008 QMS the company will have increased customer satisfaction. The drill rigs will have fewer failures, and the failures can be tracked to the source of the problem, this means that the problem can be identified and be rectified. There will be a higher output and the output will be more consistent. Profit will also increase as there will be less rework and less scrapped products as the non-conformances will be identified much quicker.

6. Solution Approach

6.1 Analyze Current Operations

The first step of the design and implementation of the QMS was for the student to analyze the current operation of the SQD Drill Rig manufacturing workshop. A detailed knowledge of all processes was necessary to design a suitable QMS. The student identified four tools to use in the analysis phase:

- **Site visits:** Physical visits to all the relevant departments of the company.

- **Interviews with employees:** The student arranged interviews with employees to obtain a comprehensive knowledge of all the relevant operations.

- **Customer requirement and design specifications:** All design specifications of the customers were reviewed by the student and a meeting was held with the manager of the QMS Drill Rig manufacturing workshop to obtain and understand all the customer requirements.

- **Work instructions:** Detailed work instructions were not compiled and written by the student for every operation contributing to the QMS Drill Rig manufacturing workshop operations because of the time constraint.

6.2 Identify the ISO 9001:2008 Requirements

The ISO 9001:2008 Standard requires that QMS documentation must include the following:

- Documented statements of TMM's Quality Policy and Quality Objectives
- A Quality Manual
- Documented Procedures required in the International Standard
- Documents required by TMM to ensure effective planning, operation and control of processes
- Records required by the International Standard

The documented procedures mentioned above consist of only six compulsory procedures listed below; the other procedures in the Standard can be documented if it is needed by TMM. The six mandatory documented procedures are:

1. Control of Documents (Clause 4.2. of ISO 9001:2008)
2. Control of Records (Clause 4.2.4 of ISO 9001:2008)
3. Internal Audit (Clause 8.2.2 of ISO 9001:2008)
4. Control of Nonconforming Product (Clause 8.3 of ISO 9001:2008)
5. Corrective Action (Clause 8.5.2 of ISO 9001:2008)
6. Preventative Action (Clause 8.5.3 of ISO 9001:2008)

These documented procedures have to be controlled in accordance with the requirements of clause 4.2.3 of ISO 9001:2008 (Control Documents)

6.3 Identify Existing Procedures

All relevant departments of the company are investigated to:

- **Establish if any documentation of processes exists:** The student followed all paper trail to find the procedures already in place in the company. Various procedures were already in place but no formal documentation thereof existed.

- **View and evaluate documents:** The existing documentation is evaluated with reference to the International Standard requirements to decide on its adequacy and necessity. Quite a few shortcomings were identified on the documentation.

6.4 Identify Additional Procedures

This step of the approach is to identify additional procedures necessary to comply with ISO 9001:2008 Standard. Not all of the procedures present in the International Standard are required for the effective operation of the companies QMS. Some of the required procedures are necessary but the documentation thereof is not required. The additional procedures identified were the following:

- Management commitment (Clause 5.1 of ISO 9001:2008)
- Internal communication (Clause 5.5.3 of ISO 9001:2008)
- Determination of requirements related to the product (Clause 7.2.1 of ISO 9001:2008)
- Review of requirements related to the product (Clause 7.2.2 of ISO 9001:2008)
  Customer communication (Clause 7.2.3 of ISO 9001:2008)
- Design and development (Clause 7.3 of ISO 9001:2008)
- Purchasing Process (Clause 7.4 of ISO 9001:2008)
- Identification and traceability (Clause 7.5.3 of ISO 9001:2008)
- Customer satisfaction (Clause 8.2.1 of ISO 9001:2008)
- Monitoring and measurement of product (Clause 8.2.4 of ISO 9001:2008)

6.5 Develop and alter required procedures

The student designs and documents the required procedures. The following five ground rules were used to design and develop the required procedures:

- Make procedures short and to the point
- Write procedure with customer in mind, not expert
- Develop procedures that can be read and used under stress
- Use simple numbering and identification system
- Place procedures where user can get to them.

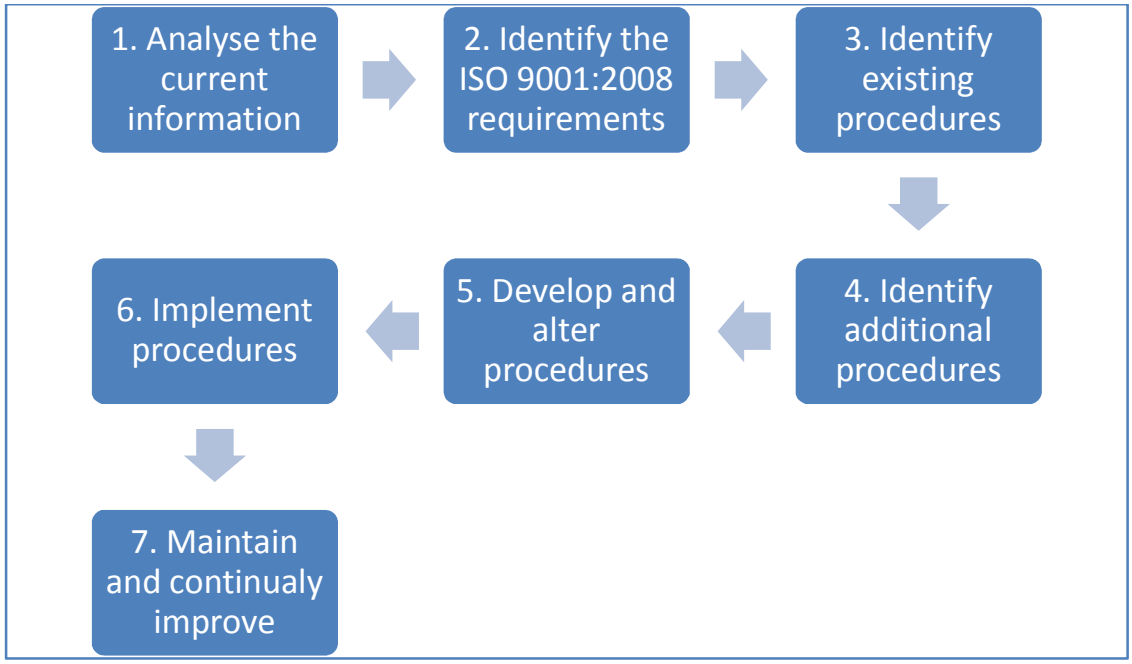
6.6 Implement Procedures

The newly created and altered procedures are implemented throughout the organization. This is done by conducting meetings with the various departments. During these meetings the required procedures are explained to all the employees and their various responsibilities are communicated clearly. The appropriate documentation is also made available at the points of use throughout the organization. This is the responsibility of the Administrative Clerk who prints and copies the required documents and distributes it to the employees.

6.7 Monitor and Continually Improve

This is an extremely important part of the project as well as for the rest of the life span of the QMS. The records produced by the various procedures at the departments are monitored to see if it complies with the Standard and if all procedures are implemented correctly. The information presented on these records is also used to identify the areas for improvement. The Management Representative as well as the employees should continually seek ways to improve the QMS.

Figure 4: Solution approach



7. Design and Implementation

This section will describe the design and implementation of the QMS. This was definitely the most important part of the project and special attention was given in terms of the student's time management and people skills to ensure that an effective QMS would be implemented at TMM in the given time space.

7.1 Analysis of the Current Environment

During the first stage of the project an understanding of the company's environment was a critical factor. It was for this reason that comprehensive work instructions for all operations which the time permitted was written. The manufacturing activities' work instructions include a description of the Operational procedure, the Risk assessment, the Loss control, the appropriate Personal Protective Equipment and Quality control. The information needed for this would be gathered by employing various data collection techniques discussed in 4.2 of this document. The list of work instructions with their identification numbers are presented in the table below:

Table 1: List of work instructions and identification numbers

Work Instruction	Identification Number
Order Processing	W0001E01
Invoicing	W0002E01
Storeroom Stock Control	W0003E01
Purchasing	W0004E01
Wage Payments	W0005E01
Creditor Payments	W0006E01
Grinding	W0007E01
General Administrative Task	W0008E01
Maintenance	W0009E01
Cutting	W0010E01

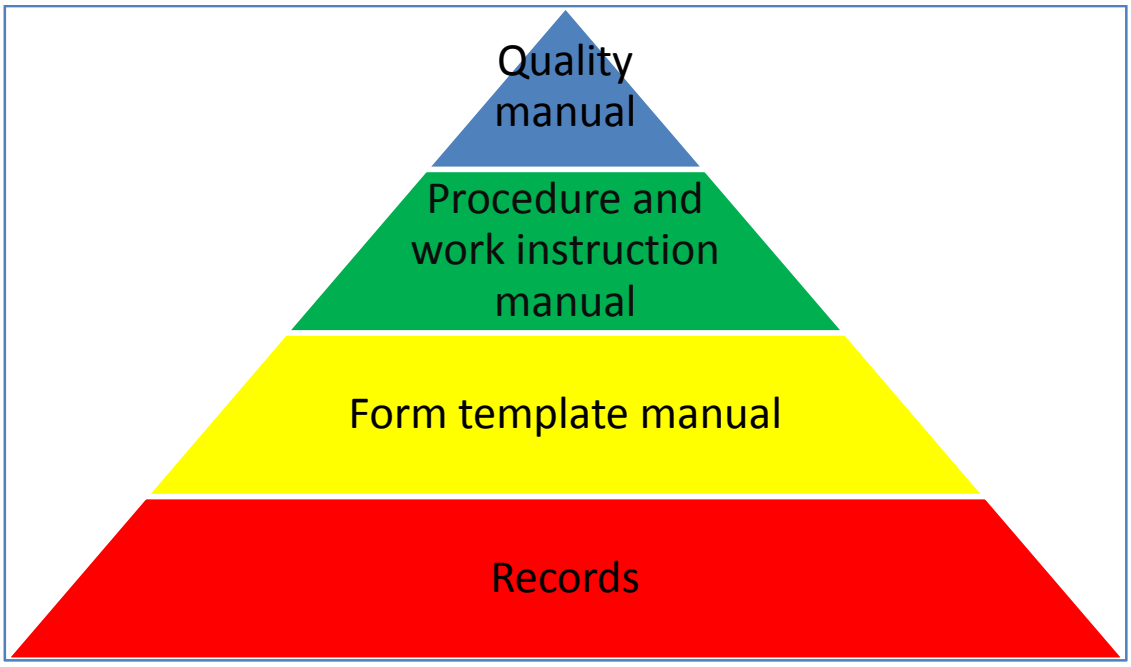
7.2 The requirements identified for ISO 9001 based QMS

All of the identified requirements are clearly stated in the preceding section 6.2 of this document.

7.2.1 Documentation Requirements

The documentation of TMM is seen by management as a functional tool for the controlling of the QMS. It is for this reason that the student gave special attention to this part of the project. All the documentation requirements were identified by the analysis of the current business environment and the study of the International Standard. The documentation requirements of the International Standard were divided into four levels as seen in the following pyramid:

Figure 5: Documentation requirements



As can be seen the pyramid is used to show that the Quality Manual is a small part of the documentation structure but it is a very important part. Records contribute to the largest amount of documentation for it is compiled over the years of production. Each of these will now be explained in detail.

Level 1: Quality Manual

The Quality Manual is the core of the QMS and it addresses each area of the International Standard and claims the compliance of the company and how they maintain it. The manual consists of the following:

- The scope of the QMS
- A reference to the documented procedure
- A description of the interaction between the processes of the QMS.

The Quality Manual can be viewed in Appendix C and on the CD accompanying this document.

Level 2: Procedure and Work Instructions Manual

The second level of the pyramid represents the quality procedures, operating procedures and the work instructions. The procedures are numbered with PXXXXEXX and the work instructions with WXXXXEXX. The PXXXX refers to the number of the procedure which correlates with the number of the procedure in the International Standard and the EXX refers to the edition of the specific procedure. TMM documented all mandatory procedures that are required by ISO 9001:2008. All the procedures and work instructions can be viewed on the CD accompanying this document and an example of each is available in the Appendix. Appendix B contains the grinding work instruction and Appendix C contains the Internal Audit Procedure and the necessary forms for this procedure.

Level 3: Form Templates Manual

A number of operating procedures and work instructions require the use of forms that were created for the company. Templates are standard forms connected to the procedures and instructions. Examples of forms are available in Appendix D. The rest of the form templates are on the CD.

Level 4: Records

The fourth level of the pyramid consists or the quality records. Most of these records are generated by the second level procedures. These records also contain the descriptions of the work completed. These records are maintained to prove the compliance with the standard. TMM

employ various record keeping methods including storage or hardcopies in the storage room as well as soft copies on the database.

7.2.2 Documented statements of TMM's Quality Policy and Quality Objectives

7.2.2.1 Quality Policy

The Top Management of TMM ensures that the Quality Policy

- Is appropriate and consistent with the purpose of the company.
- Includes a commitment to meet requirements and continually improve.
- Provides a framework for establishing and reviewing the Quality Objectives.
- Is communicated and understood in all areas or the business.
- Is continually reviewed for suitability.

The Quality Policy demonstrates the top management of TMM's commitment to continual improvement of the QMS.

7.2.2.2 Quality Objectives

The top management or TMM ensures that the Quality Objectives

- Are established.
- Are measureable and consistent with the quality policy (including commitment to continual improvement).
- Meet the requirements of the product.

The Quality Objectives must be measureable and management must communicate it to the employees to make them understand their role in the achievement of those objectives. The management also communicates the reward system they plan to implement. The reward system will be set in place to inspire the workers to achieve the objectives specified by management. The Quality Policy and the Quality Objectives can be viewed in the Quality Manual in Appendix C or on the CD accompanying this document.

7.2.3 Procedure Requirements

The ISO 9001:2008 Standard clearly stipulates only six mandatory documented procedure requirements. Other procedures stated in the International Standard are also applicable to TMM's QMS nut they are discussed later on. The six mandatory procedure were created, designed and implemented by the student and will be explained in the foi1owing section.

7.2.3.1 Control of documents (Clause 4.2.3 of ISO 9001:2008)

This clause requires control of documents from internal sources as well as documents from external sources. A formal written procedure was established

- To approve documents for adequacy prior to issue,
- To review and update as necessary and re-approve documents,
- To ensure that changes and the current revision status of documents are identified,
- To ensure that relevant versions of applicable documents are available at points of use,
- To ensure that documents remain legible and readily identifiable,
- To ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the quality management system are identified and their distribution controlled, and
- To prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

Note that the term document is used in the company to describe the information contained in various media, such as written documents, computer files, design drawings etc. The document control at TMM is basically about making sure that the document being used is the right document, approved as necessary. Records are special types of documents and a separate procedure is dedicated to the control thereof. It is very important that all documentation used in the company is numbered and easily identifiable. The formal written procedure for Control of Documents is available on the CD at the back of this document.

7.2.3.2 Control of Records (Clause 4.2.4 of ISO 9001:2008)

Records exist all over the company. This clause requires that all records need to be maintained and controlled to:

- Provide evidence of the QMS's implementation.
- Show the QMS conforms to the requirements of the Standard.
- Provide knowledge of performance.
- Show improvements of the QMS.

Records contain information on what has happened in the QMS in the past. This information is used by the management of TMM to manage the business effectively. The information is recorded on the various forms used by the company; an example of such form is the card available in Appendix B. Other forms used to record information are available on the CD accompanying this document. TMM established retention periods for their records where thought appropriate. A few examples of the records the QMS of TMM generates are:

- Customer orders
- Internal Audit reports
- Files on suppliers
- Details of non-conformances etc

The formal written procedure is available on the CD accompanying this document.

7.2.3.3 Internal Audit (Clause 8.2.2 of ISO 9001:2008)

According to the requirements of the ISO 9001:2008 standard an Internal Audit procedure that ensures that audits are conducted at planned intervals to determine whether the QMS of the company:

- Conforms to the requirements of the International Standards.
- Conforms to the management standards established by TMM.
- Is effectively implemented and maintained.

TMM will use the internal Audit procedure to stand back and look at the business objectively to decide whether the QMS is helping the business to reach their goals. A detailed procedure for the Internal Audits was compiled and is available in Appendix D. Also available in Appendix D is the form needed to conduct the Internal Audit Procedure

7.2.3.4 Control of Non-Conforming Product (Clause 8.3 of ISO 9001:2008)

This procedure was developed to assist TMM to identify products that do not conform to the product requirements and to prevent the unintended use of these products. The controls, related responsibilities and authorities for dealing with non-conforming products are defined in the documented procedure. The procedure will also explain the precise steps that need to be taken in an event of non-conformity and the follow-up actions required to rectify the problem. The complete procedure is available on the CD at the back of this document.

7.2.3.5 Corrective Action (Clause 8.5.2 of ISO 9001:2008)

A procedure that defines the requirements must be established for:

- Reviewing non conformities (including customer complaints)
- Determining the causes of nonconformities
- Evaluating the need for action to ensure that nonconformities do not reoccur
- Determining and implementing action needed
- Records of results of action taken (see 4.2.4) and
- Reviewing the effectiveness of the actions taken.

The Corrective Actions is seen as steps in the continual improvement of the quality of TMM's SQD Drill Rig Manufacturing workshop product. TMM seeks to eliminate the causes and subsequent effects of non-conformities permanently. The need for corrective actions is indicated by customer complaints, product send backs, rework and repairs etc. Management is committed to make adequate resources available for the implementation of corrective actions. The formal written procedure is available on the CD accompanying this document.

7.2.3.6 Preventative Action (Clause 8.5.3 of ISO 9001:2008)

A documented procedure is being established by TMM to define the requirements for:

- Determining potential nonconformities and their causes
- Evaluating the need for action to prevent occurrence of nonconformities
- Determining and implementing action needed
- Records of results of action take (see 4.2.4), and
- Reviewing the effectiveness of preventive action taken.

Preventative actions are viewed as very important improvement activities of the company. TMM will employ this procedure to prevent the occurrence of potential problems throughout the business processes, which can have a negative effect on the business results, products, QMS or customer satisfaction. The Preventive Action procedure is available on the CD accompanying this document.

7.3 Identified Existing Procedures

There weren't any existing procedures

7.4 Identified Additional Required Procedures

The student identified ten procedures that need to be implemented at TMM. These procedures will assist in the daily operations of TMM but no need for the documentation thereof existed. In the following section each of the identified procedures will be explained. The additional procedures identified were the following:

- Management commitment (Clause 5.1 of ISO 9001:2008)
- Internal communication (Clause 5.5.3 of ISO 9001:2008)
- Determination of requirements related to the product (Clause 7.2.1 of ISO 9001:2008)
- Review of requirements related to the product (Clause 7.2.2 of ISO 9001:2008)
- Customer communication (Clause 7.2.3 of ISO 9001:2008)
- Design and development (Clause 7.3 of ISO 9001:2008)
- Purchasing Process (Clause 7.4 of ISO 9001:2008)

- Identification and traceability (Clause 7.5.3 of ISO 9001:2008)
- Customer satisfaction (Clause 8.2.1 of ISO 9001:2008)
- Monitoring and measurement of product (Clause 8.2.4 of ISO 9001:2008)

7.5 Development and Alteration of Identified Procedure

7.5.1 Management commitment

Top management of TMM shall provide evidence of its commitment to the development and implementation of the QMS and continually improving its effectiveness by:

- Communicating to the organisation the importance of meeting customer as well as statutory and regulatory requirements
- Establishing and reviewing the Quality Policy continually
- Ensuring that Quality Objectives are reached and reviewed
- Conducting management reviews, and
- Ensuring the availability of resources.

7.5.2 Internal Communications

Aligned with the International Standard, TMM must ensure that appropriate communication processes exist to communicate the effectiveness of the QMS to all levels and functions of the business. Directors communicate with the employees through holding meetings. The Department Representative organizes team briefings to communicate with their department's employees. If an employee is experiencing a problem with a superior a complaint can be lodged at the Human Resource Representative, who will take the necessary steps to eliminate the problem in the appropriate way. TMM encourages an open door policy and any matters of concern can freely and directly be discussed with management.

7.5.3 Determination of requirements related to the product

The International Standard requires that processes are in place to help the company understands the requirements of the customer. TMM provides training for the future operator of the drill rig while assembly is taking place to insure the future operator understands the working of the drill rig. Further the manager establishes other requirements on, for example, deliveries

(done by TMM) and payments. These requirements are then communicated to the appropriate employees.

Note that post-delivery activities include, for example, actions under warranty provisions, contractual obligations such as maintenance services, and supplementary services such as recycling or final disposal.

7.5.4 Review of requirements related to the product

TMM reviews the product requirements of the customer prior to the acceptance of the contract. If any changes are made to the product requirements it is documented and discussed with the customers for their approval.

7.5.5 Customer communication

TMM identified and implemented opportunities for communication with customers. The communication method regarding the following topics will be discusses in the following section:

- **Product Information:** All product requirements are communicated and approved through the detailed designs and the meetings with customers.

- **Inquiries and Amendments to orders:** Customers inquiries are usually handled telephonically or via e-mails. The administrative Clerk of the SQM Drill Rig Workshop is responsible for the follow-up and reply on inquiries. It is also the responsibility of the Clerk to do all amendments on the order and to notify the effected parties.

- **Customer Feedback:** The customer evaluation form is sent to all customers for completion on a three monthly basis. The customer satisfaction on all levels from product quality to delivery will be evaluated. All areas for improvement will be highlighted by this process so that immediate actions can be taken. This customer feedback also forms part of the Corrective Action procedure.

- **Customer Complaints:** Currently all customer complaints are received telephonically and via e-mails. These complaints are immediately brought to the attention of

management. Management investigates the complaint and informs the Administrative Clerk of the steps that should be taken to resolve these complaints. It is the responsibility of the Clerk to notify the customer of how the complaint is handled and resolved. The manager also informs the workforce of the received complaints and gives them feedback at the monthly meetings held with the staff.

7.5.6 Design and development

The student identified the following development stages of the product:

- Turning and drilling of smaller parts
- Part Assembly and Painting
- Hydraulic installation
- Final Assembly

The workshop floor manager must manage the interfaces between different groups involved in the development of the product to ensure effective communication and clear assignment of responsibility. Planning output must be updated, as appropriate, as the development progresses.

Functional and performance requirements (or inputs) as specified in the design must be met and records must be maintained.

The outputs of the development must also be filled into a form to ensure that the design and development outputs have met the design and development input requirements.

These records of the results of the verification and any necessary actions shall be maintained to ensure that the product is capable of meeting the requirements for the intended use. Verification against the design and development input must be approved prior to release.

7.5.7 Purchasing Process

The purchasing process of TMM must be controlled to ensure that the purchased products conform to the requirements. A formal documented procedure must be created for this process

to ensure that it is done in the appropriate manner. The company has incorporated two verification procedures to monitor this procedure and to ensure that the purchased raw materials used in the production conform to all requirements. These measures are:

- **Inspections:** The workshop Floor Manager does a visual inspection on all the raw materials arriving at the premises. The Floor Manager has received the appropriate training to conduct this inspection. If any problems are observed the raw materials is returned and this information is brought to the attention or the management.
- **Supplier Evaluation:** A complete supplier evaluation form must be drawn up which will be completed for all the suppliers of TMM. Appropriate questions must be set on the form to establish the competence of the suppliers. All suppliers will be reevaluated on a six month basis.

7.5.8 Identification and traceability

It is a requirement or the International Standard that the product produced by TMM must be traceable throughout the product's lifecycle. TMM already has an identification and traceability system in place. A stamp is placed on every Drill Rig with the information or exactly when and where all the parts and materials come from. This assures that nonconformance's on a product can be traced to its origin.

7.5.9 Customer satisfaction

Customer satisfaction is a very important aspect for TMM and therefore it is evaluated on a regular basis via a Customer Evaluation Form. A customer evaluation form must still be drawn up. This evaluation form is e-mailed/faxed to the customers on a three monthly basis. These forms, on return, are individually studied by management to identify areas of concern *for* the business. Investigations towards the cause of these problem areas are launched by management. These evaluation forms are used in the continual improvement process of the company's QMS. The management gives the necessary feedback to the customers after the correct actions have been taken to eliminate these causes of concern.

7.5.10 Monitoring and measurement of product

TMM monitors and measures the characteristics of the product at appropriate developmental stages throughout the production line. This is done to ensure that customer requirements are

met and to provide evidence of the product's conformity to the documented acceptance criteria. The monitoring and measurements are conducted by means of the following inspection methods:

- Visual Inspections
- Physical Inspection by Measurement
- Equipment Inspections

Visual Inspections

Visual inspections are performed right through the production line. All employees are trained to perform the necessary visual inspection at his respective work station. The Workshop Floor Manager performs the visual inspection on the raw materials used in the production of the products.

Physical Inspections by Measurement

Two types of measurement devices, verniers and measurement tapes, are used throughout the production line. A list of the acceptable dimensions for each part that must be measured is available at their workstations. All the employees using the measurement devices received sufficient training.

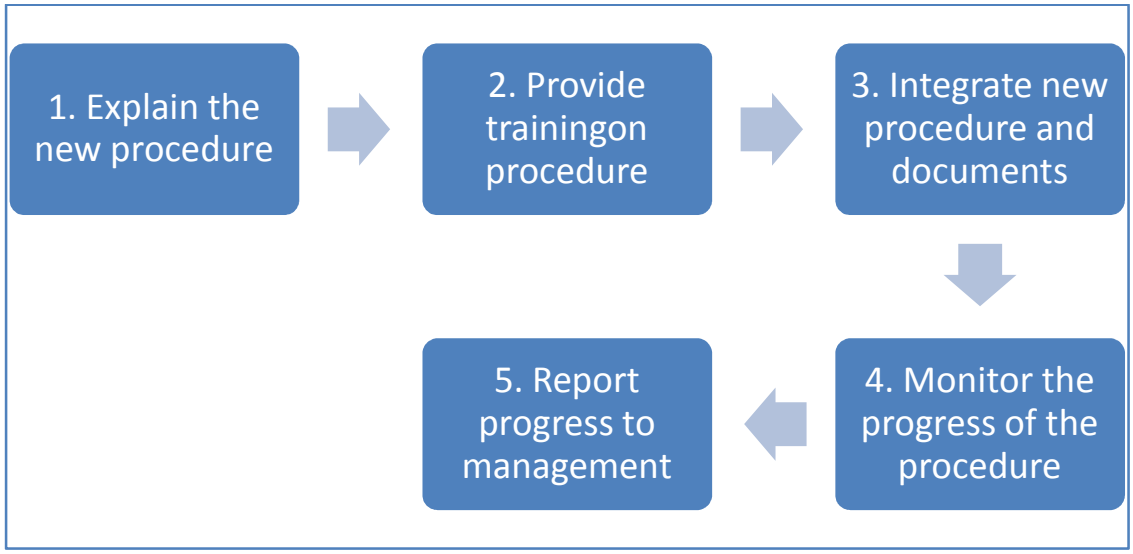
Equipment Inspection

The measuring devices used to perform the inspection are also inspected on a monthly basis. The measuring tapes are replaced as soon as the measurements start to fade away. The verniers must be calibrated once a month and complete records must be kept of this procedure which is required by clause 7.6 of the ISO 9001:2008.

7.6 Implementing of Procedures

All the procedures described in the previous section must be implemented at TMM. It will be an extremely difficult task because of the employees' hesitance towards change. The student prescribes the following simple procedure for the implementation process which is shown in the figure below.

Figure 6: Implementing procedure



7.7 Monitoring and Continual Improvement

The International Standard requires that the QMS is continually monitored and improved. TMM is fully committed to adhere to this requirement. The records produced by the various procedures of the QMS will be monitored constantly by the appropriate personal.

8. Conclusion

ISO 9001:2008 was chosen as a management system due to its simplicity and popularity worldwide as well as for the considerable benefits the company will gain. The Quality Management System will ensure that the product meets the specified requirements of their customers and that the products are of the highest quality, while management regains total control over the business operations.

A document structure (due to time constraints not fully completed) as required by ISO 9001:2008 has been set in place and this brings about a change in the attitude of the employees towards quality. Employees also see themselves as important role players in the upholding of the QMS.

The inspection methods and record keeping of the measurements will ensure that variations in processes are picked up at early stages of problem development. Overall the business will be operated with more ease due to the quality structures set in place.

The above mentioned changes and improvements will result in a reduction in nonconforming products and an increase in productivity. This leads to an increase in profit as losses are minimized and ultimately total customer satisfaction will be achieved. With the correct use of the QMS that was created for TMM, many benefits will be gained in all the levels of the business. Continual improvement to the QMS is required but TMM will benefit from this system in the long term.

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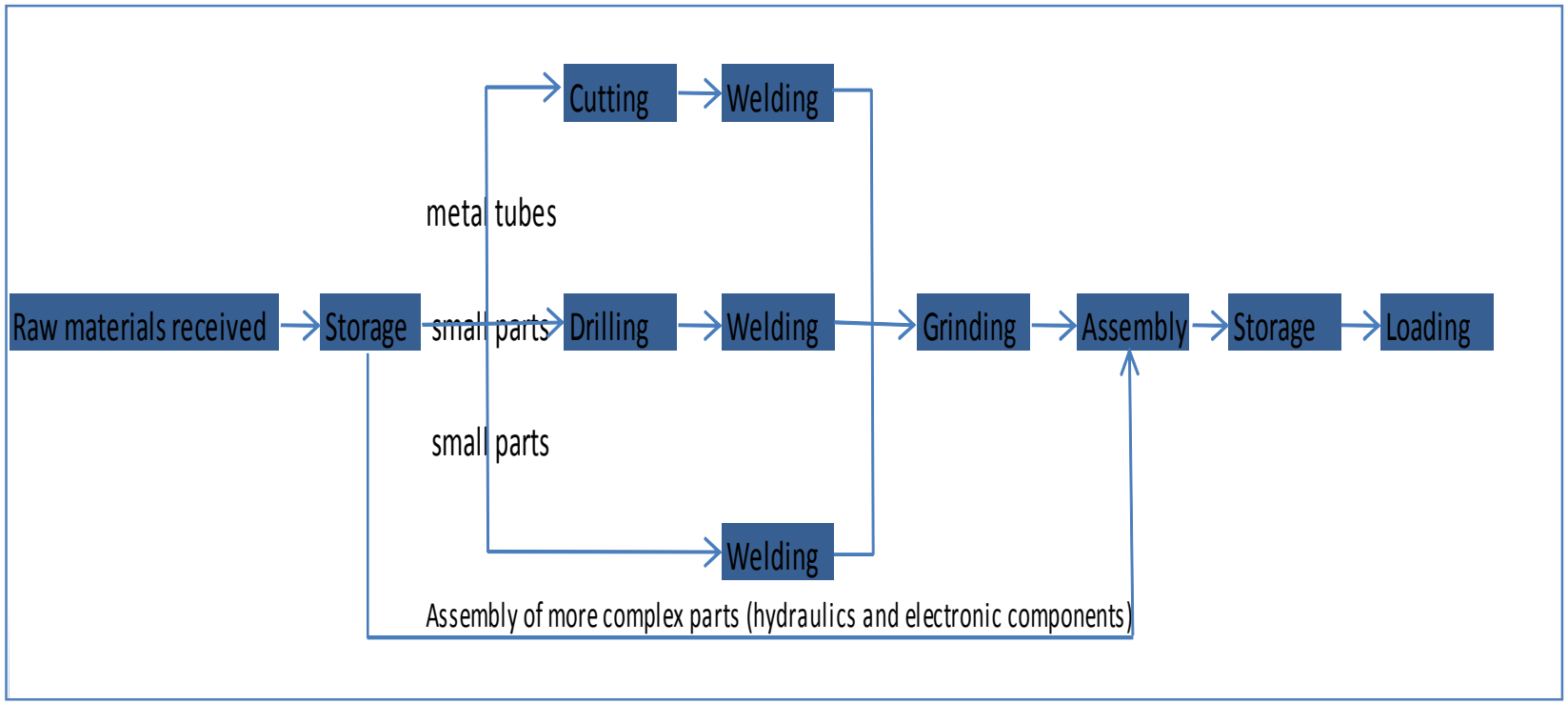
10. Appendices

Appendix A: Basic processes in the Drill Rig Manufacturing Workshop

Figure 7: Diagram of basic processes in the Drill Rig Manufacturing Workshop



Appendix B: Grinding Work Instruction

W0007E01: Process Work Instruction for Grinding:

1. Purpose:

The purpose of this Work Instruction is to provide a uniform and consistent method for the grinding of Drill Rigs. This will ensure that all grinding that occurs in the Drill Rig Manufacturing Workshop conform to the customer specifications and that the necessary safety requirements are met.

2. Scope:

This Process is applicable to the grinding that occurs in the Drill Rig Manufacturing Workshop of Triple "M" Mining at Mooinooi. Section 5.1 refers to the operational procedure; section 5.2 refers to the process's safety requirements; section 5.3 to the loss control and section 5.4 to the process's quality control requirements.

3. Definitions and Abbreviations:

TMM Triple "M" Mining

DRMW Drill Rig Manufacturing Workshop

PPE Personal Protective Equipment

4. Responsibility

4.1 The Manager of the DRMW is responsible for providing resources and managing the execution of work.

4.2 The process Owner is responsible for carrying out this Process.

5. Process Work Instruction

Process Definition: Grinding of uneven surfaces.

What are the Boundaries: Welded Drill Rig parts come from the welders, certain welds are grinded smooth and then it will be assembled.

5.1. Operational Procedures:

- Move the part to an area where it can be safely grinded.
- Determine the type of part and identify the welds that require grinding for that type of a part.
- Walk around the Drill Rig part and determine if there are any other places to be grinded.
- Use a ladder or a step to get to hard to reach places that require grinding.
- Grind the required areas to ensure the surface is smooth in that area. Do not create holes when grinding.

5.2.1. Risk Assessment:

- Other people in the work area.
    - Make sure that any person in the area where the grinding will be done is warned before the operator starts grinding.
    - These people must either leave the area or also wear eye protection.
- Flammable material or gases in the area.
    - Make sure there are no flammable materials in the area for example clothes.
    - Make sure that there is no form of gas bottle in the area for example cutting torch or CO_2 welding bottles.
- Own clothes catching fire.
    - The guard of the grinder must always be fitted and used to shield grinding sparks.
    - The grinder operator should do his work in such a manner that the sparks are directed away from his body.
- Grinder still rotating when job is finished.
    - When the grinder is switched off wait until the disc stops rotating before the grinder is put down.
    - The grinding machine should always be switched off when not in use.
- Loose grinding discs.
    - Whenever the disc is replaced the new disc should always be properly fastened.

5.2.2. Tasks for general risk assessment:

- Crane Usage.
- Handling of Metal.
- Grinding.
- Lifting heavy items.
- Noise.
- Stacking material.
- Housekeeping.
- General.

5.2.3. PPE for this process:

The Personal Protective Equipment prescribed below must be worn at all times.

- Overhauls
- Gloves
- Steel Point Shoes
- Hearing Protection(Earmuffs)
- Full face guarding shield

5.3. Loss Control:

- Use a grinding disc for grinding and a cutting disc when cutting.
- The grinding or cutting disc should have no chips out of the edge of the blade.

5.4. Quality Control

- All marks on the inside and outside of the part must be grinded flush.
- Grinding should only smooth the outer surface the operator should not grind away to much material.

What are the process objectives: To ensure the inner and outer surface of the Drill Rig parts is smooth.

NB The owner of the process has the responsibility to ensure that all actions at his workstation must be done in accordance with the above mentioned procedures. All risks as accessed above must be dealt with in accordance with the given procedures. All loss control steps take place as per the given schedule. Steps to ensure the quality of the output of the process must be followed.

Appendix C: Quality Manual

Triple MMM Mining's Quality Manual

1. General

The scope of the Quality Management System (QMS) is according to the ISO 9001:2008 standard. The QMS addresses the main aspects as required by ISO 9001 and these aspects are:

- Management Responsibility
- Resource Management
- Product Realization
- Measurement, Analysis, and Improvement Requirements

Triple "M" Mining (TMM) developed and implemented a QMS to demonstrate their ability to consistently provide products that meet their customer's and the applicable regulatory requirements. The QMS, described in this manual, will assist TMM to enhance customer satisfaction through the effective application of the system throughout the company. TMM strives to continually improve their QMS utilizing the prescribed process approach and quality management principles. These previously mentioned principles are contained in the international standards ISO 9000:2008, ISO 9001:2008 and ISO 9004:2008.

The documentation of the QMS consists of four parts namely quality manual, procedures and work instructions manual and templates manual.

2. Terms and definitions

All terms and definitions used in this quality manual is according to the ISO 9001:2008 which contains the fundamentals and vocabulary used in this manual. The reader is referred to this standard if any definition is unclear.

3. Reference Documents

The following external documents were used to obtain the necessary requirements for the QMS:

- ISO 9000:2008, Quality management systems - Fundamentals
- ISO 9001:2008, Quality management systems - Requirements
- ISO 9004:2008, Quality management systems - Guidelines for performance improvements

4. Quality Management System

4.1 Introduction

The adoption of a QMS was a strategic decision by the management of TMM. The requirements specified by the International Standard are seen as complementary to the requirements of the company's products. The QMS aims to give confidence to the customer base of TMM that the business is run well.

The QMS is a part of TMM's overall management system which establishes documents and implements their quality policy which satisfies the QMS requirements of ISO 9001:2008 and meet/exceeds customer requirements.

The International Standard promotes the adoption of a process approach during the development, implementation and improvement of the QMS. This process approach simply means that the following is managed and defined to ensure system effectiveness and that the desired results are achieved:

- Process Inputs
- Process controls
- Process outputs
- Interfaces between interrelated processes

The responsibilities for the various procedures are defined in the written document as well as in the Quality Manual. The list of procedures, work instructions and form templates are available an Appendix A of this document.

4.2 Principles

The entire OMS is based upon the following eight quality management principles:

1. **Customer Focus**

   TMM is committed to take existing and future customer requirements into account and realizes the importance of good customer relations. It is for this reason that TMM strives to not only meet customer expectations, but exceed it.

2. **leadership**

   The top management of TMM is committed to establish a unity of purpose and direction for the organization. Leadership is taken by the top management regarding the implementation and maintenance of the OMS, which serves as an example to the employees.

3. **Involvement of people**

   TMM understands that people at all levels of the organization are the essence of the business and by fully involving them with the OMS, enables the business to benefit from their abilities.

4. **Process Approach**

   All activities and the related resources will be viewed and managed as processes that will ensure the company achieves desired results.

5. **System approach management**

   To insure the effectiveness and efficiency regarding the achievement of TM M's objectives, interrelated processes are continuously identified, understood and managed as a system.

6. **Continual improvement**

   Continual improvement of TMM's overall performance is set as a permanent objective of the company and will be achieved by the employment of a consistent organization-wide approach.

7. Factual approach to decision making

TMM will as far as possible base their decisions on the analysis of sufficient, accurate and reliable data information.

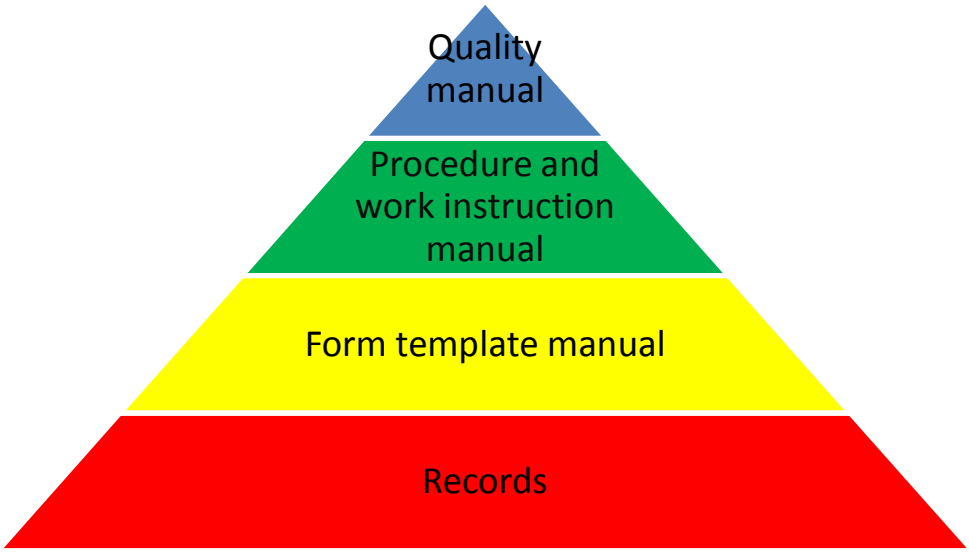
8. Mutually beneficial supplier relationships

TMM recognize that they are independent of their suppliers, but they strive to create a mutually beneficial relationship with them which will enhance the ability of both to create value.

The above explained principles were used as a framework in the development of the QMS to guide the management of TMM towards improved performance.

4.3 Documentation

The documentation structure that was formed by TMM to conform to the requirements set out in the International Standard. The system is structured into four levels as shown in the figure.



As can be seen the pyramid is used to show that the Quality Manual is a small part of the documentation structure but it is a very important part. Records contribute to the largest amount of documentation for it is compiled over the years of production.

4.3.1 Quality Manual

The Quality Manual is the core of the QMS and it addresses each area of the International Standard and claims the compliance of the company and how they maintain it. The manual consists of the following:

- The scope of the QMS
- A reference to the documented procedure
- A description of the interaction between the processes of the QMS
- Justifications for any exclusions

4.3.2 Procedure and Work Instructions Manual

The second level of the pyramid represents the quality procedures, operating procedures and the work instructions. The procedures are numbered with PXXXXEXX and the work instructions with WXXXXEXX. TMM documented all mandatory procedures that are required by ISO 9001:2008.

4.3.3 Templates Manual

A number of operating procedures and work instructions require the use of templates that were created for the company. These templates and standard forms are connected to the procedures and instructions. All the templates created for the QMS is presented in this manual.

4.4.4 Records

The fourth level of the pyramid consists of the quality records. Most of these are generated by the second level procedures. These records also contain the descriptions of the work completed. These records are maintained to prove the compliance with the standard.

5. QMS Procedures

5.1.1 Document Control

TMM documented and established a formal procedure for the controlling, monitoring and updating the documentation of the QMS. All of the requirements in the ISO 9001:2008 standard were taken into consideration while establishing this procedure. This control of documents requirements are:

- To approve documents for adequacy prior to issue,
- To review and update as necessary and re-approve documents,
- To ensure that changes and the current revision status of documents are identified
- To ensure that relevant versions of applicable documents are available at points of use
- To ensure that documents remain legible and readily identifiable
- To ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the quality management system are identified and their distribution controlled, and
- To prevent the unintended use of obsolete documents and to apply suitable identification to them if they are retained for any purpose.

All template documents must be stored on the company server and controlled by the Administrative Clerk. Please refer to P004.2.3E01 to view this procedure.

5.1.2 Records Control

Records exist all over the company. This clause requires that all records need to be maintained and controlled to:

- Provide evidence of the QMS's implementation.
- Show the QMS conforms to the requirements of the Standard.
- Provide knowledge of performance.
- Show improvement of the QMS.

Records contain information on what has happened in the QMS in the past. This information is used by the management of TMM to manage the business effectively. TMM established

retention periods for their records where thought appropriate. A few examples of the records the QMS of TMM generates are:

- Customer orders
- Internal Audit reports
- Files on suppliers
- Training details
- Details of non-conformances etc.

Please refer to P004.2.4E01 for the complete records control procedure.

5.2 Management Responsibility

5.2.1 Management Commitment

Top management of TMM shall provide evidence of its commitment to the development and implementation of the QMS and continually improving its effectiveness by:

- Communicating to the organisation the importance of meeting customer as well as statutory and regulatory requirements
- Establishing and reviewing the Quality Policy continually
- Ensuring that Quality Objectives are reached and reviewed
- Conducting management reviews, and
- Ensuring the availability of resources.

5.2.2 Customer Focus

At TMM the customer is seen as the most important part of their business. Management is committed to identify customer needs and expectations, and to translate them into reachable requirements for all the employees to ensure customer satisfaction. These requirements of the customers form the basis of TMM's Quality Objectives. The management reviews these objectives on a regular basis to ensure that they stay on top of what the customers need.

5.2.3 Quality Policy

The Quality Policy of TMM must be consistent with the purpose of the business and present the company's commitment towards meeting their customers' requirements. TMM use the Quality Policy as a framework for establishing and reviewing their Quality Objectives. The Qualify Policy is communicated and understood at the appropriate levels of the business and is continually reviewed by the top management.

Triple "M" mining Quality Policy:

As the directors of TMM we are committed to a policy of total Quality, protecting the environment and assuring a hazard free working environment for all employees. We commit Management and all employees to be part of the Quality Management System, to implement and maintain the system in order to protect their health, the environment, prevent pollution and produce a quality product. Our aim is thus directed towards achieving the following objectives:

- To provide existing and prospective customers with a high level of confidence that products produced will comply with agreed specifications.
- We will ensure that our policy is understood, implemented, communicated and maintained throughout the organization and available to interested and affected parties.
- To increase QMS awareness amongst all employees.
- To protect and conserve the environment for the future to ensure quality of life for all.
- We shall work towards continual improvement on the effectiveness of the QMS.
- We shall monitor our performance against set and reviewed objectives.
- We are committed to comply with relevant applicable legislation, regulations and other requirements to which the organization subscribes.
- The company commits itself to minimize environmental impacts, safety and health hazards, and striving to achieve zero incident rates.
- We will train employees at all levels within the organization to ensure that employees are made aware of their individual responsibilities and authority to the QMS.

We will review the QMS at set intervals to ensure it remains relevant to the organization.

5.2.4 Quality Objectives

The Quality Objectives will be established by TMM by using the Quality Policy as reference framework. The objectives of the Quality Management System are:

- To establish and maintain an effective Quality Management System complying with International Standard ISO 9001:2008.
- To ensure that 99% of deliveries are on time.
- To reduce rework by 90%.
- To establish a highly skilled workforce by training and coaching employees. Target is to train 90% of the workforce.
- To establish and maintain a constant workforce. Target is to retain 80% of employees for longer than 4 years.
- To continually improve the QMS and reviewing records on a monthly basis.

5.2.5 Quality Management System Planning

The planning of the QMS is defined as a management function in TMM. Management will therefore be responsible for ensuring that the QMS meets the requirements and quality objectives set out at all times.

Management should also ensure that the integrity of the QMS is maintained when changes are made to the QMS. It should be ensured that the QMS will still conform to the ISO 9001:2008 standard and that the changes did not negatively affect the QMS. Management should ensure that these changes are communicated to the employees.

5.3 Responsibility, Authority and Communication

5.3.1 Responsibility and Authority

The responsibility of maintaining, updating and improving the OMS, is shared by all the employees of TMM. The responsibility of each employee was explained to them in detail. The company strongly believes that all individuals should take responsibility and have pride in their work. This will ensure that all employees will share the common goal of improving quality and satisfying customer needs. The company however decided to appoint a quality management representative that will serve as the manager of the QMS.

5.3.2 Management Representative

Mr. Chris Opperman was selected by the top management of TMM as the quality representative of the company. It is his responsibility to:

- Ensure that all the processes required for the successful operation of the OMS are established correctly, implemented and maintained.
- Report to the top management of TMM the performance and improvement needs of the OMS.
- Communicate and promote the awareness of the customer requirements throughout the company.

5.3.3 Internal Communications

Aligned with the International Standard, TMM must ensure that appropriate communication processes exist to communicate the effectiveness of the OMS to all levels and functions of the business:

- Directors communicate with the employees through holding meetings.
- The Department Representative organizes team briefings to communicate with their department's employees.

- If an employee is experiencing a problem with a superior a complaint can be lodged at the Human Resource Representative, who will take the necessary steps to eliminate the problem in the appropriate way.

- TMM encourages an open door policy and any matters of concern can be freely and directly discussed with management.

No formal written procedure is deemed necessary for this procedure.

5.3.4 Management Review

The top management will hold a meeting once a month to review the QMS to ensure the continuing suitability, adequacy and effectiveness. During this meeting the opportunities for improvement and the need for changes will be discussed. The Quality Policy and the Quality Objectives must also be reviewed during this meeting.

Management will ensure that the appropriate review inputs are available consisting of:

- Results from internal audits.
- Results from external audits.
- Customer feedback.
- Product conformity numbers.
- Status of corrective and preventative actions' reports.
- Follow up actions from previous management reviews' reports.
- Proposed changes for the QMS
- Recommendations towards improvements of the OMS.

The outputs from the management reviews include all actions and decsions related to improvements and changes to the OMS.

5.4 Resource Management

5.4.1 Provision of Resources

TMM acknowledges the fact that resources are needed to both maintain and improve the QMS and understands that the effectiveness and efficiency of its operation depends on these resources. The resources needed include personnel, finance, facilities and equipment. Management will review the resources regularly as part of the management review.

5.4.2 Human Resources

The provision and management of Human Resources are viewed as a critical factor contributing to the effectiveness of the company's QMS. TMM ensures that the personnel performing work affecting product quality is competent on the basis of education, training, skills and experience. A detailed work instruction must be provided to the employee to ensure that all the responsibilities are fully understood. All the actions related to human resources are managed by the Human Resource Department. The Human Resource Officer must be provided with detailed work instructions to explain his/her responsibilities.

5.4.3 Infrastructure

The infrastructure of TMM plays an important part in the achievement of conformity to product requirement. TMM is committed to determine, provide and maintain the infrastructure needed, including:

- Buildings
- Workplace
- Process equipment (Hardware and Software)
- Transport
- Communication

The infrastructure is maintained and monitored on a regular basis by the management of TMM to ensure its suitability, workability and safety

5.4.4 Work Environment

TMM is fully committed to determine and manage the appropriate work environment needed to achieve conformity to product requirements. Their commitment is also stated in the Quality Policy.

5.5 Product Realisation

5.5.1 Planning of Product Realisation

TMM has planned and developed processes needed for product realisation. Planning of product realisation is consistent with the requirements of the QMS.
For each product TMM will ensure that:

- The processes needed for product realization are planned and developed.
- These processes are consistent with the requirements of the other processes of the QMS.
- The quality objectives and requirements for each product are determined before commencing production.
- Processes, documents and resources that are needed for the specific product is determined.
- The required validation, monitoring, inspection and test activities specific to the product are developed and communicated to the employees.
- The records needed to provide evidence that the realization processes and resulting products meet the requirements.

5.6 Customer Related Processes

5.6.1 Product Related Requirements

The customer of TMM is seen as the most important aspect of the business and for this reason TMM determines the following:

- The requirements specified by the customers.
- The requirements related to delivery and post delivery activities.
- Requirements not stated by the customer but necessary for intended use.
- Statutory requirements

- Regulatory requirements.
- Additional requirements of TMM.

5.6.2 Review of requirements related to the product

TMM reviews the requirements related to the product before committing to the supply of the product. The company ensures that:

- The product requirements are defined
- Contract and order differences are resolved
- They have the ability to meet the defined requirements

All records arising from this review is maintained by the company. When product requirements are changed it is documented and the relevant personnel are informed of the changes.

5.6.3 Customer Communication

TMM identified and implemented arrangements for communication with customers. The communication method regarding the following topics will be discusses in the following section:

- **Product Information:** All product requirements are communicated and approved through the detailed designs and the meetings with customers.

- **Inquiries and Amendments to orders:** Customers inquiries are usually handled telephonically or via e-mails. The Administrative Clerk of the SQM Drill Rig Workshop is responsible for the follow-up and reply on inquiries. It is also the responsibility of the Clerk to do all amendments on the order and to notify the effected parties.

- **Customer Feedback:** The customer evaluation form is sent to all customers for completion on a three monthly basis. The customer satisfaction on all levels from product quality to delivery will be evaluated. All areas for improvement will be highlighted by this process so that immediate actions can be taken. This customer feedback also forms part of the Corrective Action procedure.

- **Customer Complaints:** Currently all customer complaints are received telephonically and via e-mails. These complaints are immediately brought to the attention of management. Management investigates the complaint and informs the Administrative Clerk of the steps that should be taken to resolve these complaints. It is the responsibility of the Clerk to notify the customer of how the complaint is handled and resolved. The manager also informs the workforce of the received complaints and gives them feedback at the monthly meetings held with the staff.

6. Design and Development

TMM sees their core competency as being their ability to design and produce a product that the market requires. For this reason the design and development processes are seen as the most important in the company. A formal design and development procedure was developed that is based on a formal design and development cycle, to ensure that all the required procedures and actions are performed, evaluated and approved. The design and development cycle consists of the following:

1. Establishing a problem definition (What is the intended use of the product? Why is it needed? Which market segment will it target? Etc.)
2. Developing a conceptual design of the product.
3. Developing the detailed requirements specifications of the product.
4. Developing the detailed design of the product, this includes the development of:

- Detailed drawing of product
- Bill of Materials
- Pre-cut Parts
- Hydraulic Parts
- Mechanical Parts

5. The manufacturing of the first prototype. This includes:

- The procurement of the pre-cut parts.
- The procurement of the hydraulics and mechanical parts. The manufacturing of the complete drill rig.
- The assembly of the entire product.

6. The testing of the product. Testing includes:

- Development of a test procedure for the product
- Testing of the product according to the test procedure
- Conducting a field test. (Installation and testing of the product in the physical environment it will be used)

7. Evaluation of the product and test results
8. The development of the product documentation (User manual).
9. Evaluation of the product and test results
10. The development of the product documentation (User manual)

7. Purchasing

The purchasing process of TMM must be controlled to ensure that the purchased products conform to the requirements. A formal documented procedure must be created for this process to ensure that all purchases conform to the specified requirements. The company has incorporated two verification procedures to monitor this procedure and to ensure that the purchased raw materials used in the production conform to all requirements. These measures are:

- **Inspections:** The workshop Floor Manager does a visual inspection on all the raw materials arriving at the premises. The Floor Manager has received the appropriate training to conduct this inspection. If any problems are observed the raw materials is returned and this information is brought to the attention of the management.

- **Supplier Evaluation:** A complete supplier evaluation form must be drawn up which will be completed for all the suppliers of TMM. Appropriate questions must be set on the form to establish the competence of the suppliers. All suppliers will be reevaluated on a six month basis.

8. Production and Service Provision

8.1 Control of Production and Service Provision

TMM plans and carries out production and service provision under controlled conditions. The controlled conditions of TMM include:

- Availability of information with regards to the characteristics of the products.
- Availability of work instruction to all employees.
- Availability of correct and suitable equipment.
- Availability of correct monitoring and measuring devices.
- Implementing the use of monitoring and measuring devices.
- Implementation of release, delivery and post delivery activities.

8.2 Validation of Processes and Service Provision

Where the resulting output of a process cannot be verified by subsequent measurement and monitoring, TMM validates these processes. This validation processes demonstrates the ability of these processes to achieve planned results. TMM established arrangements for these processes including:

- Defining of criteria for approval of the processes where applicable.
- Approval of equipment where applicable.
- Qualification of personnel where applicable.
- The use of specific methods 2nd procedures where applicable.
- Requirements for records.

8.3 Identification and Traceability

It is a requirement of the International Standard that the product produced by TMM must be traceable throughout the product's lifecycle. TMM already has an identification and traceability system in place. A stamp is placed on every Drill Rig with the information of exactly when and where all the parts and materials come from. This assures that nonconformance's on a product can be traced to its origin. All the information is stored on the company's database for record keeping.

8.4 Control of Monitoring and Measuring Devices

The measuring equipment used in the production of the products is monitored and calibrated on a monthly basis. Full records of this procedure are kept. The measurement tapes used for inspection is also monitored on a monthly basis and replaced if necessary.

9. Measurement, Analysis and Improvement

9.1 General

TMM has planned and implemented the monitoring, measurement, analysis and improvement processes needed to:

- Demonstrate conformity of products to customer requirements.
- Ensure the OMS's conformity to the requirements of the International Standard.
- Continually improve effectiveness of the OMS.

9.2 Monitoring and Measurement

9.2.1 Customer Satisfaction

Customer satisfaction is a very important aspect for TMM and therefore it is evaluated on a regular basis via a Customer Evaluation Form. This evaluation form is e-mailed or faxed to the customers on a three monthly basis. These forms, on return, are individually studied by management to identify areas of concern for the business. Investigations towards the cause of these problem areas are launched by management. These evaluation forms are used in the continual improvement process of the company's OMS.

9.2.2 Internal Audits

According to the requirements of the ISO 9001:2008 standard TMM developed an Internal Audit procedure that ensures that audits are conducted at planned intervals to determine whether the QMS of the company:

- Conforms to the requirements of the International Standards.
- Conforms to the management standards established by TMM.
- Is effectively implemented and maintained.

TMM will use the internal Audit procedure to stand back and look at the business objectively to decide whether the QMS is helping the business to reach their goals. A detailed procedure for the Internal Audits was documented and can be viewed in the document numbered P008.2.2E01.

9.2.3 Monitoring and Measurement of Processes

TMM apply suitable methods for monitoring and measuring the processes of the QMS. The management reviews the records produced by the QMS on a regular basis to establish the processes performances. If the processes do not meet the planned results correction and corrective actions take place to ensure conformity.

9.2.4 Monitoring and Measurement of product

TMM monitors and measures the characteristics of the product at appropriate developmental stages throughout the production line. This is done to ensure that customer requirements are met and to provide evidence of the product's conformity to the documented acceptance criteria. The monitoring and measurements are conducted by means of the following inspection methods:

- Visual Inspections
- Physical Inspection by Measurement
- Equipment Inspections

All employees performing these monitoring and measuring activities are trained and competent.

9.2.5 Control of Non-conformance

This procedure was developed to assist TMM to identify products that do not conform to the product requirements and to control the unintended use and prevent the delivery of these products. The controls, related responsibilities and authorities for dealing with non-conforming products are defined in the documented procedure. The procedure will also explain the precise steps that need to be taken in an event of non-conformity and the follow-up actions required to rectify the problem. The complete procedure is documented as document number P008.3E01.

9.3 Analysis of Data

Data is collected and analysed by TMM to demonstrate the suitability and effectiveness of the QMS and to identify areas of continual improvement. The analysis of data provides information relating to:

- Customer satisfaction (Customer Evaluation Forms)
- Conformity to product requirements (Inspection Reports)
- Characteristics and trends of processes and products (Inspection results)
- Suppliers (Supplier Evaluation Forms)

9.4 Improvement

9.4.1 Continual Improvement

TMM will strive to continually improve the effectiveness of the QMS through the use of the Quality Policy, the Quality Objectives, the Audit Results, the Analysis of Data, the Corrective and Preventative Actions and the regular Management Reviews.

9.4.2 Corrective Action

TMM will establish a procedure that defines the requirements for:

- Reviewing nonconformities (including customer complaints)
- Determining the causes of nonconformities
- Evaluating the need for action to ensure that nonconformities do not reoccur
- Determining and implementing action needed
- Records of results of action taken (see 4.2.4) and
- Reviewing the effectiveness of corrective action taken.

The Corrective Actions is seen as steps in the continual improvement of the quality of TMM's SOD Drill Rig Manufacturing Workshop product. TMM seeks to eliminate the causes and subsequent effects of non-conformities permanently.

The need for corrective actions is indicated by customer complaints, product send backs, rework and repairs etc. Management is committed to make adequate resources available for the implementation of corrective actions. The formal written procedure can be viewed as document P008.5.2.E01.

9.4.3 Preventative Actions

A documented procedure is being established by TMM to define the requirements for:

- Determining potential nonconformities and their causes
- Evaluating the need for action to prevent occurrence of nonconformities
- Determining and implementing action needed
- Records of results of action take (see 4.2.4), and
- Reviewing the effectiveness of preventive action taken.

Preventative actions are viewed as very important improvement activities of the company. TMM will employ this procedure to prevent the occurrence of potential problems throughout the business processes, which can have a negative effect on the business results, products, QMS or customer satisfaction. The written Preventative Action procedure can be viewed as document P008.5.3E01.

Annexure A

List of Procedures

Procedure	Identification Number
Control of Documents	P004.2.3E01
Control of Records	P004.2.4E01
Purchasing Process	P007.4E01
Internal Audit	P008.2.2E01
Control of Nonconforming Products	P008.3E01
Corrective Action	P008.5.2E01
Preventative Action	P008.5.3E01

List of Work Instructions

Work Instruction	Identification Number
Order Processing	W0001E01
Invoicing	W0002E01
Storeroom Stock Control	W0003E01
Purchasing	W0004E01
Wage Payments	W0005E01
Creditor Payments	W0006E01
Grinding	W0007E01
General Administrative Task	W0008E01
Maintenance	W0009E01
Cutting	W0010E01

List of Forms

- F0001E01- Goods Received Note
- F0002E01-Requisition
- F0003E01-Item Order Form
- F0004E01- Price List
- F0005E01-Casing Form
- F0006E01-Tax Invoice
- F0007E01-Delivery Note
- F0008E01-Preventative Action Request
- F0009E01-Non-Conforming Product
- F0010E01-Audit Schedule
- F0011E01-Audit Checklist
- F0012E01-Corrective Action Request
- F0013E01-Internal Audit Report
- F0014E01-Written Gate Release
- F0015E01- Re-Order Quantity List
- F0016E01- Pay Slip
- F0017E01- Weekly Maintenance (Monday)
- F0018E01- Monthly Maintenance (Wednesday 1)
- F0019E01- Yearly Maintenance (Friday)
- F0020E01-Daily Maintenance
- F0021E01-Gate Release

Appendix D: Internal Audit Procedure

P008.2.2E01- Procedure for conducting an Internal Audit:

1. **Purpose:**

   The purpose of this procedure is to establish and outline the process for conducting and documenting the Internal Audit procedure. The audits will be conducted at planned intervals to ensure that that the QMS conforms to the requirements set out in the International Standard and to the requirements established by Triple "M" Mining. The QMS will also be audited on the effectiveness of its implementations and maintenance.

2. **Scope:**

   This Procedure is applicable to the auditing of the Quality Management System of the Drill Rig Manufacturing Workshop of Triple "M" Mining at Mooinooi.

3. **Definitions and Abbreviations:**

   TMM Triple "M" Mining
   DRMW Drill Rig Manufacturing Workshop
   MR Management Representative

   The Internal Audit can be defined as the independent documented activity in accordance with written checklists and procedures to verify, by examination and evaluation of objective evidence that applicable elements of a QMS have been develop, documented and effectively implemented in accordance with the International Standard.

4. **Responsibility:**

   a. The Manager of the DRMW is responsible for providing resources and managing the execution of work.
   b. The Management Representative (MR) is responsible to conduct the interview and compiling the auditing team is necessary.
   c. The Auditing team is responsible for assisting the MR with the Internal Audit.

5. Required Audits:

TMM has identified three audit requirements areas namely:

- **First party** (Internal Audit)
  Definition: An audit by TMM of its own QMS and its procedures
  Objective: Assure maintenance, development and improvement of QMS.
- **Second party** (External Audit)
  Definition: An audit by a certification body which is commercially and contractually independent of TMM, its suppliers and customers.
  Objective: Determine whether TMM's QMS has been documented and implemented in accordance with the ISO 9001:2008 standard.

The fundamental requirements for a successful audit are recognized by TMM to be:

- Support from management
- Trained auditors
- Timely access to facilities, documents and personnel
- Access to all levels of management
- Well defined auditing procedures.

5.1 Internal Audit:

The Internal Audit procedure of TMM is divided into four phases:

1. Planning
2. Preparation
3. Performance
4. Reporting & Follow-up

Each phase is described in the following sections.

5.1.1 Planning

The manager of the DRMW is responsible for the planning phase of the Internal Audit Procedure.

- Select an auditor and an audit team if necessary.
- The scope of the audit is decided on.

- The time and resources needed for the audit is calculated.
- A detailed audit schedule is created and documented on the Internal Audit Schedule form(F0041E01)
- All the documentation is filed in the Internal Audit file.

5.1.2 Preparation

- The manager of the DRMW briefs the auditor and the auditing team on the purpose and scope of the audit.
- All necessary documentation is reviewed.
- Checklists are prepared on the Audit Checklist form (F0042E01) by considering the following of the audited procedures:
  - Processes which are taking place.
  - Relevant procedures.
  - All documents and records used in the procedures.
  - Requirements set out in the International Standard.
- Notify all the departments of the audit.
- Set date and time with each department for the start of the audit.

5.1.3 Performance

The audit performance process consists of the following:

- **Opening meeting:** The auditor discusses the audit scope and purpose with the audit team. The reporting and follow-up procedures are explained.
- **Conduct actual audit:** Team members obtain information about people, processes, equipment, materials and documentation in each department. Checklists are completed at each department to verify that the QMS exists, operates effectively and correct.
- **Review the findings:** When the audit is completed the auditor must conduct a private review of the findings. The checklist and notes of the auditor and the team members will be review. A list of non-compliances will be constructed.
- **Finding statement:** A short statement which contains the overview of the findings, the description of the non-compliances and a summary of the requirements must be written and filed with the checklists in the Internal Audit file.

- **Corrective Action:** The manager of the DRMW reads and investigates the Finding Statements. The manager decides on a course of action to correct the identified problem and completes a Corrective Action Request form (F0043E01). This form is presented to the department with the non-conformity to implement the corrective action.

5.1.4 Reporting and Follow-up

After the audit the following should be done by the auditor:

- **Audit Reporting:** A concise and easy to read written report must be produced containing the following:
  - Description of the audit scope.
  - Auditor and auditing team's identity.
  - Description of the deficiencies, observations and supporting evidence.

The report is written on the Internal Audit Report Form (F0044E01) and presented to management.

- **Follow-up and Close out:** The process of determining whether the corrective actions requested have been implemented is called "Follow-up". The action relating to the verification and acceptance of the corrective actions by the auditor is called "Closed out".

5.2 External Audit

The external audit will be conducted by SABS on the terms specified in the International Standard.

6. References

6.1 Forms

- F0010E01- Audit Schedule
- F0011E01- Audit Checklist
- F0012E01- Corrective Action Request
- F0013E01- Internal Audit Report

6.2 Standards

International Standard-ISO 9001:2008(E)-Quality Management System Requirements.

Audit Schedule Form Template

Audit Schedule

F0010E01

Audit Key		Audit Plan
	ASL	Audit Scheduled
	AC/S	Audit Completed and Satisfied
	AC/U	Audit Completed and Unsatisfied
	CA Date	Corrective Action Follow-up Audit Date
	CA/C/S	Corrective Action Follow-up Audit Completed and Satisfied
	CO Date	Close Out Date

Procedure/Department	JAN	FEB	MRT	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC

Audit Checklist Template

Audit Checklists

F0011E01

Date:	Audit No:	
Auditor:	Department/Procedure:	
Requirement:	**Compliances(Yes/No/NA)**	**Comments/Remarks**
		Sheet No. Of

Corrective Action Request

Corrective Action Request (CAR)

F0012E01

Audit/Request No:	**CAR No: Of**
Auditor/Requester:	**Audit/Request Date:**
Dept Rep:	**Procedure/Dept:**
Details of Non-Conformance:	
Signature:	**Signature:**
Dept Rep:	**Auditor/Requestor:**
	Date:
Corrective Action Taken To Prevent Recurrence:	
Signature:	
Dept Rep:	**Date:**
Re-Audit Results:	
Signature:	
Auditor/Requester:	**Date:**

Internal Audit Report Template

Internal Audit Report

F0013E01

Auditor:	**Audit Report No:**
Dept Rep:	**Date:**
Dept/Procedure:	**Previous Audit Date:**
Summary Audit:	
Signature:	**Signature:**
Auditor:	**Dept Rep:**
Date:	**Date:**