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R&D AND SAFETY KEEPING FOCUS AND FINGERS

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1. ABSTRACT

Meeting safety objectives and requirements in an explosives research environment is an ongoing challenge. Nobody ever argues about the importance of safety but safety always seems to be the first aspect that gets neglected when the scientist focuses on his work in the laboratory. The magnitude of this neglect varies around a number of factors like experience, work pressure and the novelty of the work, to name but a few. One of the biggest challenges in the AELMS R&D department is to create a culture of explosives safety in an environment where there is a growing gap between experience and in-experienced scientists (explosives related experience). A system has been developed in the AELSM R&D department with the goal to create and build an understanding of the relation between explosives safety and experimental work.

2. INTRODUCTION

Working safe in any environment is always a main priority for any company. Numerous risk assessment and HAZOP methods exist and works well in an established manufacturing environment. Ensuring safety in an environment where the conditions differ on a daily basis remains challenging.

Research and development is one such area and even more so when working with explosives. Although basic laboratory safety principles are valid it does not specifically cater for all the safety needs when working with explosives.

Researchers want to be safe, but they also have multiple demands on their time/attention:

- Keeping their integrity in their field,
- Maintaining contacts throughout the scientific community,
- Publications, Reports, patents,
- Designing experiments,
- Obtaining important research results,
- Managing laboratory Staff,
- Keeping resources operational,
- Maintaining compliance with local and national regulations.

Researchers are often driven by:

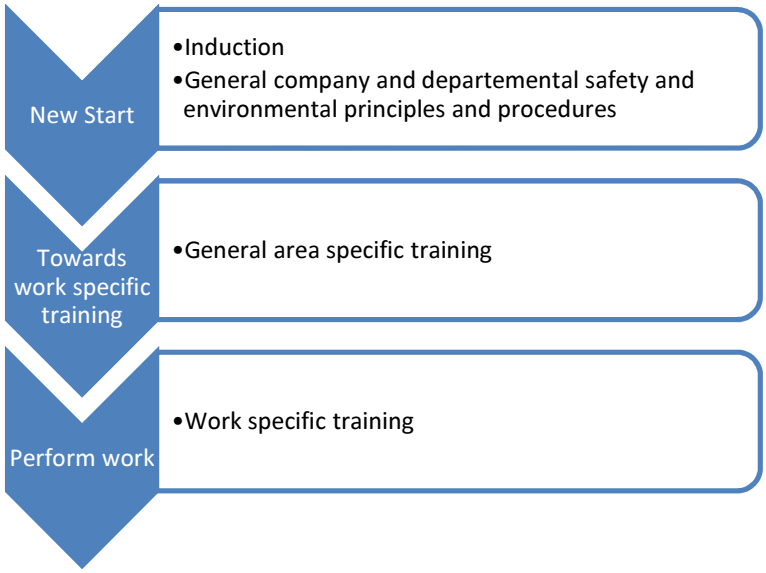
- Discovery (a passion),
- Getting funding so they can continue their work,
- Working for a reputable organization,

- Meeting milestones,
- Getting the biggest bang for the client's buck.

When the researcher's demands and drive is combined it can be seen that safety is interwoven but can also easily be neglected.

Formal Risk Assessments and HAZOPS can be a long and tiresome exercise and, although it has its place and are very important, can contribute to a lack of enthusiasm. The safety challenge is thus to find the balance of creating an environment where safety remains the main focus without it being conceived as a time wasting exercise.

The R&D department within AEL Mining Services regards safety and a thorough approach towards safety as of extreme importance. The current approach towards performing any work is described in the diagram below.



This approach works well specifically where established, routine action or work is addressed. However the research environment seldom has this luxury. Experimental work often falls outside the normal (routine) scope of work within the department. This is seen as "new work". New work can include the following:

- Use of unfamiliar chemicals,
- Exploring the synthesis of new explosives and explosives related formulations,
- Exploring new manufacturing and assembling techniques,
- Exploring new explosives systems and configurations.

The magnitude of new work can range from a once of experiments to a formal development approach.

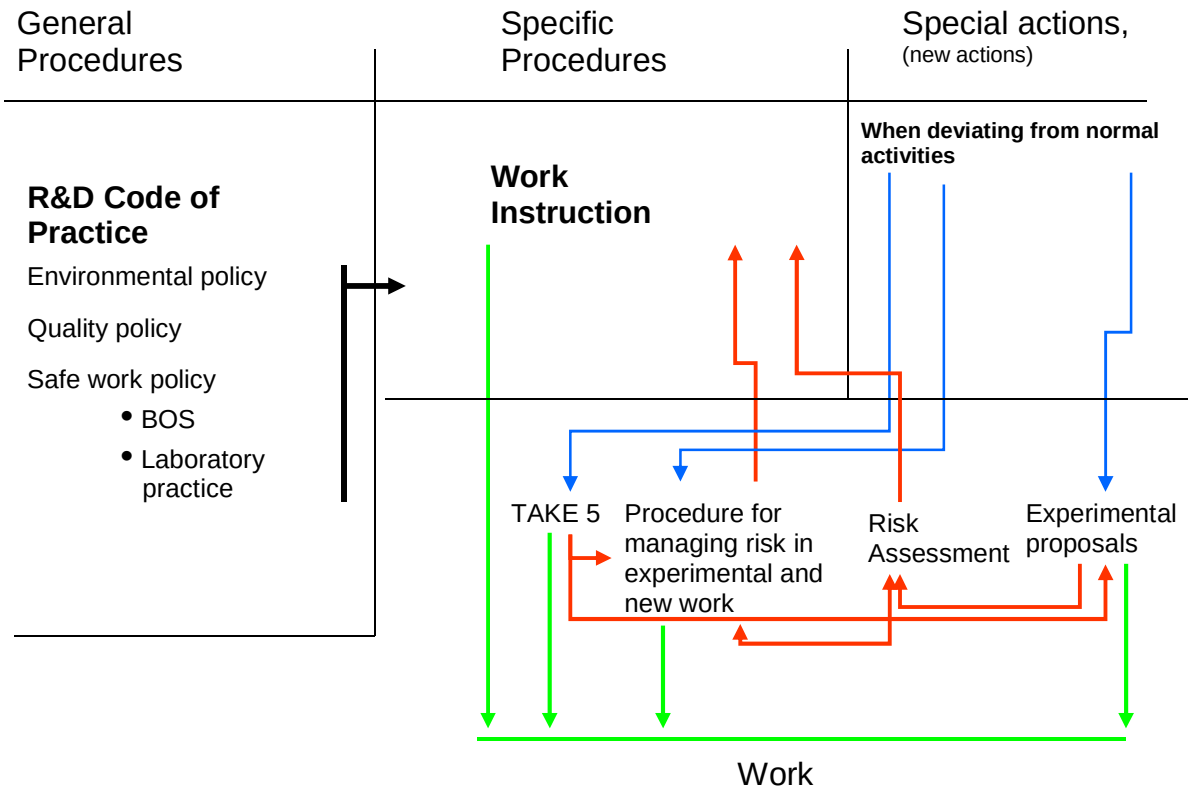
AEL Mining Services has developed a methodology to breach the gap between routine actions and novel experimentation with specific regards towards safety.

The main aim of this methodology is to create ***qualitative safety awareness*** focussing specifically at the task that wants to be performed.

3. DISCUSSION

This methodology describes the approach that must be followed when new work is to be conducted. The term “new work” refers directly to activities that fall outside the normal scope of work within the department.

The methodology is depicted in the diagram below.



3.1. Description

The focus of the methodology is on the experimental proposal section. The general and specific procedure sections are well established. The diagram above describes the process to be followed when new work is to be performed. Three entry level routes are identified namely:

a) Take 5 Route,
b) Procedure for managing risk,
c) Experimental proposal.

3.2. Take 5

The take 5 system is a quick, task specific tool that evaluates the risk and applicable mitigation to ensure safety when the task is performed. The system basically works on a colour coding system that consists of green, yellow and red areas. The green areas are indicative of an acceptable risk and red areas are indicative of not acceptable risk.

When a red or yellow risk has been identified the next step can be either to follow the procedure for managing risk or move directly to an experimental proposal.

3.3. Procedure for managing risk

This procedure asks for a very detailed description of the proposed work. This must be addressed in the form of a detailed process flow diagram, step by step breakdown of the proposed procedure to be followed, identification of all raw materials to be used.

This procedure is usually conducted for high risk activities and is usually followed by a formal risk assessment. After a formal risk assessment a safe work procedure is written and the work can then commence.

3.4. Experimental proposal

This document is a document used for creating safety awareness. It is usually completed for work that needs to be repeated for a limited number of times. This document forms the basis of this methodology. The document covers the following:

- Aim, description and expected outcomes of the experiment,
- Facility to be used,
- License constraints in terms of the number of persons involved and work to be performed,
- Current knowledge about the work to be performed,
- Characteristics of materials to be used,
- Experimentally induced hazards,
- Unintended hazards (probable hazards that can present itself but are not part of the experimental design,

After completion of this document the person performing the task will have an understanding of the probable hazards that might be expected. These can then be mitigated to ensure a safe working environment.

When this document is discussed and it comes to light that the probable hazards have been under estimated a formal risk assessment will be conducted.

4. CONCLUSIONS

The introduction of this methodology created an environment where safety is the main focus without jeopardising the drive of the researcher. It provides peace of

mind to the safety manager of the R&D facility in the sense that he/she knows that the researchers in his environment are familiar with potential hazards and where to expect them.

5. TAKE HOME MESSAGE

Keeping focus ensures safety. Maintain focus by introducing simple safety methods for day to day activities.

6. ACKNOWLEGEMENTS

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7. REFERENCES

Bezuidenhout, H., ***Methodology on how to address new work in the explosives area***. AEL Mining Services Internal Document. 2009.