

# **THE ROLE OF HEALTH AND SAFETY STANDARDS WITH SPECIFIC REFERENCE TO THE CMA STANDARD ON HEALTH AND SAFETY AROUND CONVEYOR BELT INSTALLATIONS AND THE HIERARCHY OF LEGISLATION IN SOUTH AFRICAN LAW**

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## **INTRODUCTION**

It is commonly accepted that where controls are inadequate or non-existent conveyor installations pose a significant risk to those who are involved in its installation, operation and maintenance.

Conversely, the implementation and enforcement of adequate controls correspondingly reduces these inherent risks. In fact, it may be argued that despite the potential for harm, bulk materials handling equipment manufacturers and the mining industry at large have been successful in addressing the potential for harm. Hill<sup>i</sup>, in a paper presented to Beltcon 16 in 2011 shows that an estimated 3% of mining fatalities between 1989 and 2006 were attributable to conveyor operations. While still a tragic figure, it is submitted that this is comparatively low given the potential for harm in the South African context. This is illustrated when the 3 percent figure above is compared to the American statistics over the same period, which shows that 9,2% or 49 fatalities out of a total 533 were attributable to conveyor installations.<sup>ii</sup>

This relative success in addressing risk is not accidental, and is attributable to the implementation of specific controls.

Primarily, these specific controls fall into one of three categories. These categories are mandatory controls which are the outcome of the legislative process, voluntary controls, in other words where no strict legal prescription exists but a user of a conveyor belt installation adopts an internal standard and hybrid standards. Hybrid standards are found where a mandatory requirement for a control exists but the content or scope of the standard is not defined.

This paper will distinguish between these three categories of standards within the South African context and will highlight the role of the CMA in the development of these standards.

## **THE LEGAL HIERARCHY OF CONTROLS.**

From a legal perspective, not all standards are equal. The hierarchy of legal standards determines which legal rules take precedence in the case of conflict. The hierarchy of legal standards is determined by the competent authority that passes it or under whose jurisdiction it is enacted.

## **THE CONSTITUTION**

Prior to the advent of the Constitution of the Republic of South Africa (in both its interim and current guises) Acts of Parliament were supreme. The advent of constitutional democracy has however meant that Acts of Parliament are subject to the Constitution.<sup>iii</sup> While the Constitution obviously does not specifically deal with matters related to Conveyor Installations, it does place an obligation on the state<sup>iv]</sup> to create a legal framework where the specific rights contained in the Constitution in general and the Bill of Rights in Chapter 2 specifically, are protected. These basic rights would include:

1. The right to Fair Labour practice<sup>v</sup>
2. The right to life<sup>vi</sup>
3. The right to a healthy environment<sup>vii</sup>
4. The right to bodily and phycological integrity<sup>viii</sup>

The Constitution does not impact the use of Conveyor Installations directly but guarantees the basic rights of those who may be impacted on by Conveyor Installations on the one hand and places a duty on the State to take steps to protect those basic rights. This is done through the adoption of Legislation.

## LEGISLATION

Legislation, within the South African context, is the product of the democratic process insofar as it must be adopted by both the National Assembly and the National Council of Provinces.

With reference to the legal standards applicable to health and safety matters in the mining industry, including Conveyor Belt Installations specifically, the principal Legislation is the Mine Health and Safety Act, 1996. The current Act is the outcome of a legislative process dating back to the late 20<sup>th</sup> century. Table 1<sup>x</sup> illustrates the development of Principal Legislation dealing with Health and Safety within the mining industry.

Table 1: List of Acts in South Africa

1883	Cape Colony Mining Act
1898	South African Republic Gold Act
1903	Transvaal Colony Mines, Works and Machinery Ordinance
1911	Union of South African Mines and Works Act
1956	Mines and Works Act
1991	Minerals Act
1996	Mine Health and Safety Act

The Mine Health and Safety Act, 29 of 1996, is the current Principal Legislation. It however does not directly deal with Conveyor Installations but contains the key prescripts applicable to the various role players in industry, being Employers, Employees and Manufacturers or Suppliers. As such, it is generic in its approach.

This may be exemplified by Section 5(1)<sup>x</sup> of the Act, which reads:

5. ***Employer to maintain healthy and safe mine environment***

(1) *As far as reasonably practicable, every employer must provide and maintain a working environment that is safe and without risk to the health of employees.*

While Section 5 would find application to Conveyor Installations, it stops short in detailing specific Employer or Manufacturer obligations. In essence, it requires the Employer and Manufacturer to take steps as far as is reasonably practicable to ensure that their installations do not harm persons but without stating what these reasonable measures are.

Some of the more important generic prescripts applicable to Conveyor installations are listed in Table 2.

Table 2: Generic prescripts

Section	Obligation
2(a)(1)	Design, construct and equip mine to provide for healthy and safe operation.
5(1)	Provide and maintain a healthy and safe working environment
6(1)(a)	Supply all necessary health and safety equipment and facilities
11	Assess and respond to risk
21	Design, manufacture, supply and provide equipment for use on a mine which is safe to use (when used properly) and complies with legal requirements.

It is obvious that where no specific requirements for the design, installation and operation of Conveyor Installations is found in the Act it would leave users and designers in a difficult position. Where no specific requirements exist, steps as far as is reasonably practicable would have to be shown to have been taken to prevent harm. The risk lies in the fact that what is deemed to be reasonably practicable prior to an accident may not be deemed to be so by a competent court of law or formal inquiry some years after an accident.

The legislation acknowledges the need for more specific regulation where more technical matters are considered. Of specific interest is the role of the Minister in creating Regulations as the next level of legal standard below the principal enabling legislation.

## REGULATIONS

Section 98 of the Act states:<sup>xi</sup>

### **98. Regulations**

- (1) *The Minister, after consulting the Council, by notice in the Gazette may make regulations regarding -*
- (a) *health and safety of persons at mines;*
  - (b) *health and safety standards, codes of practice and the provision of protective clothing, equipment and facilities in connection with health and safety at mines;*
  - (c) *...;*
  - (d) *health and safety management systems at mines;*
  - (e) *orderly operations at mines;*
  - (f) *...;*
  - (g) *...;*
  - (h) *the conditions under which machinery, equipment or material may be erected or used at mines;*
  - (i) *the elimination, control and minimisation of health and safety hazards;*
  - (j) *...;*
  - (k) *...;*
  - (l) *...;*
  - (m) *the conditions in which equipment, structures, water sources or the surface of land may be used, and the prohibition on, or restriction of, the erection of equipment and structures and the use of water sources or the surface of land in the vicinity of the working places at a mine; etc.*

Section 98 gives the Minister of Mineral Resources sweeping rights to create Regulations (with very limited exception) to give effect to the general objectives of the Mine Health and Safety Act.

It must however be kept in mind that although additional new Regulations may be created, a body of Regulations developed over many years, informed by changing technology but also based on the outcome of investigations into mining accidents.

As it stands, the regulations applicable to Conveyor Installations (made in terms of the Mine Health and Safety Act) are the Minerals Act Regulations in force in terms of Schedule 4 of the Mine Health and Safety Act, and the Mine Health and Safety Act Regulations made in terms of Section 98.

The existence of two sets of Regulations applying to the mining environment is a result of the history of the development of the mining legislation. When the Minerals Act replaced the Mines and Works Act in 1991, it adopted the Mines and Works Act Regulations and when it in turn was replaced by the Mine Health and Safety Act in 1996, Schedule 4 of the new Act adopted the previous Regulations. A recurring theme since 1997 has been the repeal of old Regulations, and the making of new Regulations dealing with the same topic under the Mine Health and Safety Act. This process has however been slow, and while it is ongoing, leads to a situation where both old and new Regulations remain in force for a given topic.

The approach after the promulgation of the Mine Health and Safety Act Regulations in 1996 was to deal with the principal and significant risks in mining based on accident statistics.

Where Conveyor Belt Installations are concerned, it had been shown that the trend internationally is for a reduction in the Fatal Injury Frequency Rate associated with its use. This has historically not been part of the South African experience prior to 1996, and it has been shown that Conveyor Belt Installations have historically contributed to a large proportion of mining accidents, with 37% of all machinery related fatalities between 1988 and 1992 being contributed to Conveyor Installations (tail pulleys specifically)<sup>xii</sup>.

As a result, Conveyor Installations were dealt with as a specific topic under the Mine Health and Safety Act Regulations in Chapter 8.9.

Table 3 lists the topics dealt with in the Mine Health and Safety Act Regulations Chapter 8.9.

Table 3: List of topics

<b>Regulation</b>	<b>Topic</b>
8.9	Definitions
8.9(1)	Prevention of injury due to rotating or moving parts and components
8.9(2)	Prevention of harm due to falling mineral/material
8.9(3)	Prevention of harm due to fire
8.9(4)	Duty to prevent build-up of material with potential to cause harm
8.9(5)	Duty to take steps to prevent harm due to lightning
8.9(6)	Incorporation of SANS 10266:2006 Edition 1 on man riding belt conveyors
8.9(7)	Determination that references in SANS 1026:2006 are not normative
8.9(8)	Duty to test safety devices at set frequencies
8.9(9)	Duty to draft a procedure on belt splicing, joining and reparation.

Although Chapter 8.9 of the Mine Health and Safety Act Regulations contains specific requirements relating to Conveyor Installations, it should not be viewed in isolation or be interpreted as the only requirements manufacturers or employers can be held liable for when non-compliant.

Figure 4<sup>xiii</sup> lists the Regulations (from both the new Mine Health and Safety Act Regulations and the extant Minerals Act Regulations) in force and which will be applicable to Conveyor Installations over and above the specific requirements in Regulations Chapter 8.9.

Table 4: List of Regulations

<b>Mine Health and Safety Act Regulations</b>	<b>Minerals Act Regulations</b>
Chapter 5– Fires and Explosions	Chapter 3 – General Provisions
Chapter 8 – Machinery and Equipment	Chapter 4 – Workmen
Chapter 10.1 – Hazardous Locations	Chapter 5 – Surface Protection
Chapter 10.3 – Draw Points, Tipping Points, Rock Passes and Box Fronts	Chapter 20 – Machinery: Special Safety Measures
	Chapter 21 – Machinery

It has been illustrated that the Constitution has general applicability to the mining industry insofar as basic human rights are concerned, that legislation, like the Mine Health and Safety Act, is promulgated to regulate these human rights and that Regulations are drafted to cater for the specific achievement of the objectives of the legislation, this does not form the sum total of legal rules applicable to Conveyor Installations on a mine.

Section 98(5) enables the Minister to incorporate any health and safety standard into a Regulation.

## INCORPORATED HEALTH AND SAFETY STANDARDS

Section 98(5) reads:

*The Minister may incorporate all or part of any health and safety standard, without restating the text of it, in a regulation by referring to the number, title and year of issue of that health and safety standard or, to any other particulars by which that health and safety standard is sufficiently identified.*

Where old order Regulations are repealed and the topic it deals with replaced under the Mine Health and Safety Act Regulations, a common theme is the incorporation of Health and Safety Standards. It must be noted that these tend to be SANS codes, but the Minister is not precluded from incorporating any Health and Safety Standard, whatever its origin.

The only Health and Safety Standard currently incorporated in the Conveyor Regulations (Mine Health and Safety Act Regulations Chapter 8.9) is SANS 1026:2006 – Edition 1, “The safe use, operation and inspection of man riding belt conveyors in mines”. There are however other Incorporated Health and Safety Standards applicable to Conveyor Installations, even if indirectly and dependant on specific application. These are listed in Table 5:

Table 5: Other standards

Legal Reference	Standard	Topic
MHSA Regulation 3.30	SANS 10142: 2006	Wiring of premises
MHSA Regulation 3.31	SANS 10280: 1995	Overhead power lines
MHSA Regulation 3.32	SANS 10222: 2002	Electric fencing
MHSA Regulation 10.1	SANS 10108: 2005	Classification of hazardous locations
MHSA Regulation 10.1(1)(d)	SANS 10086-2: 2004	Electrical equipment in hazardous locations
MHSA Regulation 10.1(2)(cc)	SANS 10012: 2004	Use of light metal in hazardous locations



Non-compliance with any of these Incorporated Health and Safety Standards would constitute a non-compliance with a Regulation.

While Incorporated Health and Safety Standards are technically Regulations, they do not form the lowest level of legal rules applicable to Conveyor Installations in terms of the Hierarchy of Legislation.

### **MANDATARY CODES OF PRACTICE.**

Section 9 of the Mine Health and Safety Act incorporates the principle of Codes of Practice. This can be seen as the formalisation of self-regulation, insofar as the individual Employer has a legal duty to draft a Code of Practice once the Chief Inspector of Mines publishes a guideline.

Section 9(2) states:

*An employer must prepare and implement a code of practice on any matter affecting the health or safety of employees and other persons who may be directly affected by activities at the mine if the Chief Inspector of Mines requires it.*

In summary, where the Chief Inspector publishes a guideline, it would be an offence for an Employer not to draft and implement a Code of Practice based on that Guideline. This is punishable by an administrative fine of R 1 000 000<sup>xiv</sup>

The principal Mandatory Code of Practice applicable to Conveyor Installations is titled “Guideline for a mandatory code of practice for the safe use of conveyor installations for the transportation of mineral, material or personnel.” Some of the topics which have to be covered in a mine’s Conveyor Mandatory Code of Practice includes:

1. Design,
2. Installation, extension, dismantling, transport and reinstallation,
3. Maintenance and repairs,
4. Fire prevention.

As Conveyor Installations form an integral part of an operational mine, it must again be stressed that the legal standards applicable to the Installation will not be limited to those applicable to Conveyor Installations alone.

Table 6 lists other Mandatory Codes of Practice with some impact on Conveyor Installations

Table 6: Other Mandatory Codes of Practice

Mandatory Code of Practice	Guideline Number
Prevention of Flammable Gas Explosions in Mines Other than Coal Mines	DME 16/3/2/1 - A2
Prevention of Flammable Gas Explosions in Collieries	DME 16/3/2/1-A1
Occupational Health Programme for Noise	DME 16/3/2/4-A3
The Design, Development/Construction. Safe Operation and Maintenance of Draw Points, Tipping Points, Rock Passes and Box Fronts	DMR 16/3/2/2-A6
Prevention of Fires at Mines	DMR 16/3/2/4-B1

## VOLUNTARY STANDARDS

Section 9(1) of the Mine Health and Safety Act states that an Employer may draft a Code of Practice on any topic it deems necessary, which is deemed to be a voluntary health and safety standard.

It may be argued that the Conveyor Manufacturer Association’s Safety Around Belt Conveyors Guideline<sup>xv</sup> is such a voluntary health and safety standard when adopted by an Employer.

The Guideline was drafted as an industry initiative by members of the Association, with the stated aim being to increase the level of safety in the mining industry where bulk materials handling is concerned. The chair of the safety Committee has stated:

*...“The CMA listens to these complaints, requests etc. and has been instrumental as an Industry Association in the development and promotion of safe working practices, Safety Guidelines and promotion through the DMR.”<sup>xvi</sup>*

This is mirrored in the Guideline’s stated purpose, being:

*“The purpose of this document is to serve as a minimum specification for the design of safe operating conditions and fulfilment of safety requirements for belt conveyors in accordance with the statutory regulations and Acts pertaining to machinery, particularly those sections applicable to conveyors.”<sup>xvii</sup>*

The Guideline covers a variety of topics. Those specific topics which include defined and measurable standards are listed in Table 7. Table 7 also indicates the corresponding legal requirement (where applicable) and further identifies where no corresponding legal standard exists:

Table 7: Topics covered in the CMA Safety Around Belt Conveyors

<b>Safety Around Belt Conveyors topic</b>	<b>Legal requirement</b>
Written procedure for work on running conveyors	Similar, Regulation 8.9(1)(b)
Design and approval of belt clamps in accordance with CMA MC01 (2005)	No corresponding requirement
Requirements for a pre start checklist	No corresponding requirement
Pre start warning (minimum 10 seconds)	Similar, Regulation 8.9(1)(f)
Requires a permit system required for maintenance crews	No corresponding requirement
Requires belt alignment sensors	No corresponding requirement
Requires belt overload sensors	No corresponding requirement
Requires belt slip protection	No corresponding requirement
Take up over-travel	No corresponding requirement
Transfer chute indicator	No corresponding requirement
Bin level sensors	No corresponding requirement
Pull cord station intervals	No corresponding requirement
Rip detectors	No corresponding requirement
Lightning protection	Similar, Regulation 8.(9)(5)
3,5 metres positionally safe height	No corresponding requirement
0,85 metres clearance distance	No corresponding requirement
Requirements for square openings	No corresponding requirement
Elongated openings	No corresponding requirement
Guarding of nip points based on risk rating	No corresponding requirement

Based on an analysis of the Guideline it is apparent that some of the voluntary standards have been adopted by the Minister through incorporation in Chapter 8.9 of the Mine Health and Safety Act Regulations. It is however also clear that those standards not adopted from the Guideline into the Regulations exceed the minimum legal standard.

This then begs the question as to the legal status of those voluntary standards contained in the CMA guideline but not incorporated into the Regulations.

While the full content of the guideline has not been taken up into the Regulations, the previous version of the Guidelines (Revision 03) has been copied into the Mandatory Code of Practice Guideline published in terms of Section 9(2). This means non-compliance with contents carries a potential administrative fine, but is not punishable with imprisonment as for non-compliance with a Section of the Act or a Regulation.

This is a confirmation of the hierarchy of legislation as discussed in this paper, with the Constitution being Supreme and voluntary standards forming the lowest level of legal rule. This is illustrated in Table 8:

Table 8: Hierarchy of legislation and voluntary standards

<b>Legal Standard</b>	<b>Impact</b>
Constitution of the Republic of South Africa	Details basic human rights and places duty on the State to create an enabling environment through legislation, enforcement agencies etc.
Mine Health and Safety Act	Regulates the general principles related to Health and Safety in the Mining industry.  Requires the adoption and creation of Regulations to give effect to the Act.
Mine Health and Safety Act Regulations Minerals Act Regulations	Details specific obligations in terms of designing, constructing, maintaining and operating Conveyor Installations.
Incorporated Standards	Contains technical requirements which form legal obligations
Mandatory Codes of Practice	Requires the drafting of internal procedures which must cover set requirements. Creates a legal obligation.
Voluntary Standards	May cover any topic and contain any prescription as long as this is consistent with any obligation listed above.

## CONCLUSION

The design, manufacture, operation and maintenance of Conveyor Installations falls within the hierarchy of legal rules applicable to the mining industry.

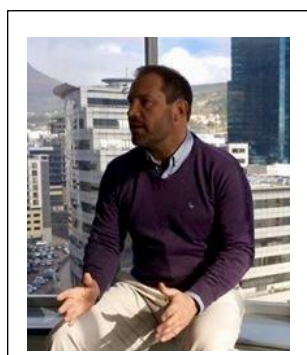
The CMA has played a seminal role in the development of specific legal prescripts as applicable to Conveyor Installations. This has taken place in two ways. On the one hand, some of the standards contained in the CMA's Guideline on Safety Around Conveyor Belts have been adopted into Regulations Chapter 8.9, as illustrated in Table 7. Further standards, while not adopted into Regulation, have been added to the Mandatory Guideline published in terms of Regulation 9(2). This does not (in accordance with the hierarchy of legislation) carry the same weight as a Regulation, but constitutes a legal standard.

Statistically, the last decade has seen a decrease in the amount of fatalities associated with Conveyor Installations. It is submitted that the role of the Industry in lobbying for, and in the creation of, technical standards for Conveyor Installations have played a significant role in this.

## REFERENCES

1. Hill, John. An assessment of the effectiveness of safety interventions in the field of bulk materials handling, Paper presented to Beltcon 16, Johannesburg, 2011.
2. Constitution of the Republic of South Africa – 108 of 1996.
3. Swartz, Jaco – The potential legal liabilities posed by conveyor belt installations. Paper presented at SafeCon 2014.
4. Mine Health and Safety Act 29 of 1996, as amended
5. CMA, Safety around belt conveyors guideline, CMA MS01 Rev.04/2016
6. Exton, Alan. Chairman, CMA Safety Committee, personal correspondence, 2018/10/05

## ABOUT THE AUTHOR



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## **End Notes**

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<sup>i</sup> Hill, John – An assessment of the effectiveness of safety interventions in the field of bulk materials handling, Paper presented to Beltcon 16, Johannesburg, 2011.

<sup>ii</sup> Hill, John – An assessment of the effectiveness of safety interventions in the field of bulk materials handling, Paper presented to Beltcon 16, Johannesburg, 2011.

<sup>iii</sup> Constitution of the Republic of South Africa – 108 of 1996

<sup>iv</sup> Constitution of the Republic of South Africa – 108 of 1996, Chapter 2, Section 7(2)

<sup>v</sup> Constitution of the Republic of South Africa – 108 of 1996, Chapter 2, Section 23(1)

<sup>vi</sup> Constitution of the Republic of South Africa – 108 of 1996, Chapter 2, Section 11

<sup>vii</sup> Constitution of the Republic of South Africa – 108 of 1996, Chapter 2, Section 24(a)

<sup>viii</sup> Constitution of the Republic of South Africa – 108 of 1996, Chapter 2, Section 12(2)

<sup>ix</sup> Swartz, Jaco - The safe operation of belt conveyor systems in the mining industry. The development of legal prescriptions within the South African context. Paper presented to Beltcon 19.

<sup>x</sup> Mine Health and Safety Act 29 of 1996, as amended – Section 5(1)

<sup>xi</sup> Mine Health and Safety Act 29 of 1996, as amended – Section 98

<sup>xii</sup> Swartz, Jaco. The potential legal liabilities posed by conveyor belt installations. Paper presented at Safecon 2014.

<sup>xiii</sup> Swartz, Jaco - The safe operation of belt conveyor systems in the mining industry. The development of legal prescriptions within the South African context. Paper presented to Beltcon 19.

<sup>xiv</sup> Mine Health and Safety Act 29 of 1996, as amended – Section 55B read with Annexure 8 Table 2

<sup>xv</sup> CMA, Safety around belt conveyors guideline, CMA MS01 Rev. 04/2016

<sup>xvi</sup> Exton, Alan. Chairman, CMA Safety Committee, personal correspondence, 2018/10/05

<sup>xvii</sup> Exton, Alan. Chairman, CMA Safety Committee, personal correspondence, 2018/10/05