Australian Standard®

Underground mining—Shaft equipment

Part 1: Drum winding overwind safety catch systems

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Australian Coal Association
Australian Mining Industry Council
Broken Hill Mining Managers Association
Bureau of Steel Manufacturers of Australia
Chamber of Mines of Western Australia
Confederation of Australian Industry
Department of Industry and Economic Planning, Victoria
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Part 1: Drum winding overwind safety catch systems

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PREFACE

This Standard was prepared by the Standards Australia Committee on Mining Equipment.

It is one of a series of Standards on mine shaft equipment. The other Standards in the series are as follows:

(a) *Underground mining—Shaft equipment,* Part 2: *Friction winding arresting and overwind safety catch systems.*

(b) *Underground mining—Shaft equipment,* Part 3: *Drum winding gripper systems*

(c) *Underground mining—Shaft equipment,* Part 4: *Conveyances, for vertical shafts.*

(d) *Underground mining—Shaft equipment,* Part 5: *Headframes.*

(e) *Underground mining—Shaft equipment,* Part 6: *Guides and rubbing ropes for conveyances.*

(f) *Underground mining—Shaft equipment,* Part 7: *Sheaves.*

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FOREWORD

Overwind safety catch systems should be incorporated in drum winding installations to provide a safeguard against malfunction of the detaching hook catch mechanism or failure of the suspension gear in the event of an overwind.

During an overwind which causes the detaching hook to be drawn into the catchplate or detaching bell and the rope to be detached, the conveyance will continue upward until its kinetic energy is dissipated either by potentially destructive impact or by harmless conversion to gravitational potential energy. The possibility of damage to the conveyance, the conveyance suspension gear, and the conveyance contents should be avoided by designing the conveyance suspension equipment with sufficient length and freedom of movement to ensure that the conveyance can rise unimpeded until the kinetic energy is harmlessly dissipated.

This free upward movement will result in slack suspension equipment which can be severely stressed and possibly broken if the conveyance is allowed to fall back through an excessive distance. The overwind safety catch system should act to limit the distance that a conveyance can fall back following such an overwind.

STANDARDS AUSTRALIA

Australian Standard

Underground mining—Shaft equipment

Part 1: Drum winding overwind safety catch systems

1 SCOPE This Standard specifies requirements for overwind safety catch systems in vertical shaft drum winding installations.

This Standard does not apply to vertical shaft friction winding installations and it makes no provision for an overwind with a detach velocity greater than the maximum detach velocity.

NOTE: Guidelines on information to be provided by the purchaser and the supplier are given in Appendices A and B.

2 DEFINITIONS For the purpose of this Standard, the definitions below apply.

2.1 Shall—indicates that a statement is mandatory.

2.2 Should—indicates that a statement is advisory.

2.3 Statutory Authority—an authority having statutory powers to approve mine hoisting installations in the State or Territory within the Commonwealth of Australia.

2.4 Approved and approval—approved by or approval of the Statutory Authority.

2.5 Safe working load—the maximum static load permitted to be carried by the suspension equipment.

2.6 Overwind safety catch system—a system of devices mounted in the head frame and on the conveyance to prevent the conveyance from falling an excessive distance after the winding rope has been detached from the conveyance.

2.7 Detaching hook—a device located between the end of a winding rope and a conveyance so that in the event of an overwind an ascending drum-wound conveyance is detached from the rope and held in the headframe.

2.8 Catchplate/Detaching bell—an apparatus in a headframe which operates a detaching hook in the event of an overwind and from which the detached conveyance is suspended.

2.9 Conveyance—any car, carriage, cage, skip, kibble, or stage in which persons, minerals, or materials are wound through a shaft or any counterweight.

2.10 Headframe—the structure, including its footings, which supports the rope loads in a winding installation.

2.11 Overwind—unintentional travel of an ascending conveyance beyond its normal operating limits.

2.12 Point of entry—the lowest position of the conveyance in the headframe at which lowering of the conveyance is prevented by the overwind safety catch system. (See Figure 1.)

2.13 Point of engagement—the lowest position of the conveyance in the headframe at which those parts of the overwind safety catch system which are mounted on the conveyance are engaged in accordance with the design intent with the interlocking parts mounted in the headframe. (See Figure 2.)

2.14 Point of detach—the position of the conveyance in the headframe when the hoist rope is detached from the conveyance.

2.15 Point of impact—the lowest position of the conveyance in the headframe during an overwind when further upward movement is prevented by either—

(a) the conveyance striking the headframe or skyshaft; or

(b) the conveyance attachments jamming between the conveyance and the headframe or skyshaft.

2.16 Fall-back distance—the maximum distance that an overwound conveyance which has passed the point of engagement can descend before being halted by the overwind safety catch system. (See Figure 3.)

2.17 Detach velocity—the velocity of the ascending conveyance at the point of detach.

2.18 Operating distance—the distance from the point of detach to the point of impact.

3 MATERIALS The materials used in the fabrication of the overwind safety catch system shall be selected with due regard to their impact properties at the lowest expected ambient temperature.

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