

**OCCUPATIONAL HEALTH AND SAFETY ACT 2000****Notice under clause 112A of Occupational Health and Safety Regulation 2001****Requirements for design registration of powered winding systems**

I, ROBERT REGAN, Chief Inspector under the Coal Mine Health and Safety Act 2002, , pursuant to clause 112A of the *Occupational Health and Safety Regulation 2001* (the Regulation), by this notice, specify the requirements set out in the Schedule below as the requirements that must be met prior to powered winding systems (of a type listed in the Table to clause 107 as modified by Schedule 4A of the Regulation) used in underground mines at a coal workplace (referred to in this notice as powered winding systems) being registered under Subdivision 1 of Division 3 of Part 5.2 (as modified by that Schedule) of the Regulation.

Dated this 29<sup>th</sup> day of January 2007.

**ROBERT REGAN**  
Chief Inspector  
NSW Department of Primary Industries  
(by delegation)

**Schedule****1.0 DESIGN REQUIREMENTS**

All powered winding systems must be designed, manufactured, installed and commissioned in accordance with:

- a) MDG 33:1998, '*Guideline for design, commissioning & maintenance of drum winders*', and
- b) MDG 2005:2003, '*Electrical technical reference for the approval of power winding system*' as applicable.

In addition, the following guideline and standards must be used in the design, construction and commissioning, as applicable for relevant components which constitute the powered winding system.

***Mine Design Guidelines***

MDG 12:1992    *Guideline for the construction of friction winders*

MDG 26:1999    *Guideline for the examination, testing and discard of mine winder ropes*

MDG 33:1998    *Guideline for design, commissioning & maintenance of drum winders*

MDG  
2005:2003        *Electrical technical reference for the approval of power winding system*

***Australian Standards***

AS  
1554.1:2004        *Structural steel welding - Welding of steel structures*

AS 3600:2001	<i>Concrete structures</i>
AS 3637.1:2005	<i>Underground mining - Winding suspension equipment - General requirements</i>
AS 3637.2:2005	<i>Underground mining - Winding suspension equipment - Detaching hooks</i>
AS 3637.3:1997	<i>Underground mining - Winding suspension equipment - Rope cappings</i>
AS 3637.4:2002	<i>Underground mining - Winding suspension equipment - Drawbars and connecting links</i>
AS 3637.5:2005	<i>Underground mining - Winding suspension equipment - Rope swivels and swivel hooks</i>
AS 3637.6:2005	<i>Underground mining - Winding suspension equipment - Shackles and chains</i>
AS 3751: 2005	<i>Underground mining - Slope haulage - Couplings, drawbars, and safety chains</i>
AS 3785.1:2006	<i>Underground mining - Shaft equipment - Shaft overwind safety catch system</i>
AS 3785.2:2006	<i>Underground mining - Shaft equipment - Shaft winding arresting systems</i>
AS 3785.3:2005	<i>Underground mining - Shaft equipment - Drum winding gripper systems</i>
AS 3785.4:2002	<i>Underground mining - Shaft equipment - Conveyances for vertical shafts</i>
AS 3785.5:1998	<i>Underground mining - Shaft equipment - Headframes</i>
AS 3785.6:1996	<i>Underground mining - Shaft equipment – Guides and rubbing ropes for conveyances</i>
AS 3785.7:2006	<i>Underground mining - Shaft equipment – Sheaves</i>
AS 3785.8:1994	<i>Underground mining - Shaft equipment - Personnel conveyances in other than vertical shafts</i>
AS 3990:1993	<i>Mechanical equipment - Steelwork</i>
AS 4100:1998	<i>Steel structures</i>
AS 4812:2003	<i>Non-destructive examination and discard criteria for wire ropes in mine winding systems</i>

## 2.0 CERTIFICATION

A qualified practicing engineer(s) registered on the National Professional Engineers Register (administered by Engineers Australia) or a qualified practicing engineer acceptable to the chief inspector must undertake the following:

- a) Confirm that the design of the powered winding system, as identified by a series of drawings, test certificates and other documents, meets the requirements of MDG 33 and MDG 2005, unless specifically stated.

Where a non-conformance to MDG 33 or MDG 2005 is identified the confirmation must state the non-conformance and how, in the qualified engineer's opinion, an equivalent level of safety is provided or the requirement is not relevant to the particular powered winding system.

- b) Identify and state any technical specifications as required for the manufacture, assembly, testing and commissioning of the powered winding systems and its components, to meet the above requirements and standards.
- c) Confirm the design of each safety critical component of the powered winding system identifying the component and stating the design loads, standards and conditions to which the certification is applicable.
- d) Review any alterations to the powered winding system.

Notes:

1. For existing winders, copies of previous apparatus approval documents and accompanying drawings may be considered satisfactory.
2. If the component is registered by Workcover for the same function, i.e. man lift box then design and item registration documents may be acceptable in lieu of certification and design calculations.

Where the powered winding system is subject to a functional safety approach, a Certified Functional Safety Expert (CFSE) shall undertake a complete review and provide a statement of compliance with AS61508, AS61511 or AS62061 as appropriate.

### 3.0 INSTALLATION

The installation and commissioning of the powered winding system must be carried out under the supervision of a qualified mechanical and electrical engineer.

An opportunity must be provided for witnessing of the commissioning process by engineering representatives of the Senior Inspector of Mechanical Engineering and Senior Inspector of Electrical Engineering of the Department of Primary Industries.

### 4.0 ASSESSMENT

#### 4.1 Mechanical assessment

The following documents (or documents containing the following information) must be provided with the design registration application for mechanical assessment:

- a) A detailed description of the powered winding system including:
  - (i) Purpose and description of use.
  - (ii) Designed, winding loads and speeds for both men and materials.
  - (iii) A functional specification on the controls of the powered winding system including all designed control, their limits and set points.
  - (iv) Identification of each component which constitutes the powered winding system.

- (v) Operational requirements
  - (vi) Any other information pertinent to the safe operation of the powered winding system.
- b) Representational drawings of the powered winding system including:
- (i) General arrangement drawings
  - (ii) Winding plant and conveyance drawings
  - (iii) Drawings or identification of the cable (rope) and associated attachments
  - (iv) All hydraulic and pneumatic control system drawings.
  - (v) Another drawing as required to clearly identify the powered winding system
- c) Appropriate documentation on the design of each safety critical component of the powered winding systems including, but not limited to: the winding plant; the cable (rope) and associated attachments; the winder control system(s); the conveyances, and the supporting structures.

The documentation must include design calculations, drawings and certification as described above.

- d) A requirement by requirement assessment of the winding system against MDG 33 by a qualified mechanical engineer.
- e) A risk assessment to verify the integrity of the winding plant under all operational and maintenance conditions, including the failure of components. (FMEA on the control circuit).
- Note: This risk assessment must be in a form which systematically analyses the failure of all components of the winding apparatus, e.g. Failure Modes Effect Analysis (FMEA), Fault Tree Analysis (FTA), Event Tree analysis (ETA), Quantitative Risk Assessment (QRA) etc.
- f) A design operational risk assessment on the use of the winding system in the mine. The risk assessment must include: commissioning, operation, examination and testing, maintenance, winch control, communication, competencies, training and emergency procedures.
- g) Details of the commissioning process.

Note:

1. This process will be required to be repeated every 5 years maximum.
2. Witnessing by DPI mechanical and electrical engineering officers is required.
3. Should include; static load testing of the conveyance and winding apparatus, static and dynamic brake testing, control function verification (limit switches).

- h) Additional documentation may be requested depending on the documentation submitted.

Note: Safety files to be kept and maintained on the powered winding system

#### 4.2 Electrical Assessment

All documents, as specified in MDG 2005:2003 must be provided with the design registration application for electrical assessment.