XT-115 PROP
RISK ASSESSMENT

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Introduction

This document has been compiled as a risk assessment for the XT-115 Prop designed and manufactured by ELBROC MINING PRODUCTS PTY/LTD. This assessment pre-empts any potential application and trials that will be conducted underground.

A comprehensive assessment will be carried out in accordance with the guidelines (QSP 111 Issue 1)

The aim of this assessment is to identify the potential hazards associated with the use of these permanent support units in underground stoping operations and to list control measures to eliminate or reduce that potential.

1. Product Description

The manufacturers of the XT-115 Prop have developed the unit to be a permanent support system. The primary purpose of this prop is to allow it to be pre-stressed to generate an active support resistance in an underground environment where such needs are identified by the mine. This is achieved by manually operating a setting tool, hydraulic pump and pumping water via a high pressure hose connected to the jackpot pre-stressed unit through a valve.

2. Design Criteria

The TX-115 prop is designed as a permanent support

1. Pre-stressed to a minimum of 100 kN and
2. The unit is available in different lengths

3. Risk Assessment Team

In dependant consultants (Groundwork Consulting) were approached to conduct the risk assessment of the XT 115 Prop. The team that compiled this provisional assessment consisted of:

Trevor Clements	Site Manager
Mike Kevane	Manager Mine Support Services
Francois Malan	Operations Director

4. Objectives

In order to effectively identify the hazards associated with this product, a process as set out below facilitates a logical approach to formulating the risk indices.

1. Utilize a task procedure for installing and transporting the prop to identify probable hazards.
2. Apply a risk rating for each hazard.
3. List preventative measures.

All the above are tabulated in Appendix 1.

5. Hazard Classification

The following definitions are appropriate to this risk assessment and will be referred to in this document:

HAZARD **-**something that has the potential to cause harm.
RISK **-**the likelihood that harm from a particular hazard will occur.
SEVERITY **-**extent of the risk associated with the harm that a person might suffer as well as the number of persons likely to be harmed.
PROBABILITY -the chance that a person or persons will be harmed during the exposure period.
CONSEQUENCE **-**the degree of harm; the potential severity of injuries.

*The matrix below has been adopted from the **Anglogold policy and procedure** (QSP 111 Issue 1 – dated 1999–02-15) and appropriately incorporated into the risk rating of this product.*

By allocating a value for the **consequence** and **probability** in the table, the risk can be quantified.

		Probability					
		Expected result	Quite possible	Unusual but possible	Remotely possible	Very unlikely	Practically impossible
Consequence	*Index*	1	2	3	4	5	6
Catastrophic	1	48	47	45	42	38	33
Disaster (few fatalities)	2	46	44	41	37	32	27
Very serious (single fatal)	3	43	40	36	31	26	21
Serious (serious injury)	4	39	35	30	25	20	15
Important (temporary disability)	5	34	29	24	19	14	10
Of concern (minor injury)	6	28	23	18	13	9	6
No incident	7	22	17	12	8	5	3
Near miss	8	16	11	7	4	2	1

FACTOR	**INDEX**
Consequences	
1. Catastrophic (many fatalities)	**1**
2. Disaster (a few fatalities).	**2**
3. Very serious (one fatality).	**3**
4. Serious (serious injury).	**4**
5. Important (temporary disability).	**5**
6. Of concern (minor injury).	**6**
7. No incident	**7**
8. Near miss	**8**
Probability	
1. Is the most likely and expected result if event occurs.	**1**
2. Quite possible (50/50).	**2**
3. Unusual but possible.	**3**
4. Only remotely possible (has happened somewhere).	**4**
5. Conceivable but very unlikely (hasn't happened yet).	**5**
6. Practically impossible (one in a million).	**6**

6. Conclusion

Primary hazards associated with the direct use of these products within the designed specifications and controls will be minimized if the correct installation and transport procedures are applied.

This provisional risk assessment is restricted to the application of these products for underground permanent stope support only.

APPENDIX 1

ELBROC XT-115 Prop

PROCESS	ACTIVITY	HAZARD	CONS	PROB	RISK	PREVENTATIVE MEASURES
Installation	Making the work and support area safe	Falls of ground resulting in injuries to persons	3	2	40	Employ mine standard / procedure for barring down the hanging wall and creating a stable footwall
	Determine mine support standard. Installing the prop in accordance to the mine standard	Not installed to the mine standards will decrease in areal coverage - increased area of possible instability (FOG)	4	3	30	Demarcation of installation pattern Install to mine standard
	Prop support to be positioned at right angles to the dip of the strata	Prop not installed at right angles - uneven load distribution on temporary prop support and increased risk of being dislodged by mining operations or rock movement	5	3	24	Training on installation of support
	Correct length of the unit for the applicable stope width	Units with incorrect length would lead to ineffective support resistance and possible dislodging resulting in hanging wall collapses and injuries to persons	3	3	36	Order units with correct length for the relevant working place
	Installing of prop support	Injury to workers due to toppling of the prop before pre-stressing has taken occurred. .	6	2	23	Wear protective clothing and ensure that hands are not sited between the prop and hanging- or footwall Training needs to be conducted to ensure the correct number of people

ELBROC XT-115 Prop

PROCESS	ACTIVITY	HAZARD	CONS	PROB	RISK	PREVENTATIVE MEASURES
Loading - Surface	Stacking of props in store	Toppling of bundles thereby creating obstructions and injuries to passers by.	5	4	19	Do not stack more than two bundles on top of one another Ensure correct placement in store to prevent obstructions
	Off loading from transport vehicle	Bundles falling off and injuring persons	5	4	19	Make use of forklift and /or crane operations Ensure correct procedural training for operators.
	Stacking in material car	If not stacked properly, the units may dislodge and disrupt rolling stock.	7	3	12	Pack units flat in material cars
Transport In Stope	To be secured on both ends to the mono winch rope	Prevent damage of props by dragging	6	2	23	Apply mine standard for mono rope procedures for securing objects
	Physical transport	Bodily injuries due to weight of the unit.	6	3	18	Ensure that two persons carry the unit simultaneously Make use of two carrying straps where provided on the unit.

TRAINING FOR PROP INSTALLATION

During testing and implementation of the XT 115 Prop our Underground Instructors and Underground Technicians will be available for advice as well as technical backup.
After the approval of the product by the mine, the Training center will be supplied with the relevant information for incorporation into the lesson plans. The mine trainers will also be trained by ELBROC.

Recommended installation procedure

It is assumed for this procedure that:

1. The User's safety procedures and standards are fully complied with. The prop is intended to complement such standards and in no way supersedes or replaces any safety standard.

2. The complete prop with pre-stressing and headboard is available at the point of installation.

3. Stope-width measuring devices are available.

4. Adequate air and water supplies and hydraulic pump are available.

5. The pump output has been set at the desired pressure needed to achieve the required pre-load and the hose is fitted with filler nipple;

6. The correct clothing and PPE is worn.

PREPARING PRESSURIZING EQUIPMENT FOR PROP INSTALLATION

Step 1 Ensure air and water hoses and hydraulic pump is available at the installation site. Flush out air and water hoses and attachments to remove any dirt.

Step 2 Fit air and water inlet hoses to hydraulic pump.

Step 3 Fill and test the system until water is seen to flow from the connecting nipple. Check for any leaks from hoses and couplings and an adequate flow from the connecting nipple.

INSTALLATION OF THE PROP

Step 1 Ensure that the prop installation site is prepared and made safe according to the mine standard.

Step 2 Measure the length of prop required.

Step 3 Place prop firmly in the position where measured and place headboard on top.

Step 4 Lift ram to extended position and put lifting tool into position, press downwards to maximum load by hand.

Step 5 Connect hose to jackpot and move 3 to 5m away then pre-stress pot .

Step 6 Remove hose after installation .