Eskom	Task Manual	Technology

Title: **DISMANTLING OF OVERHEAD LINES**

Unique Identifier:	**240-77090523**
Alternative Reference Number:	**34-2120**
Area of Applicability:	**Engineering**
Documentation Type:	**Task Manual**
Revision:	**1**
Total Pages:	**19**
Next Review Date:	**August 2019**
Disclosure Classification:	**Controlled Disclosure**

Compiled by

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Consultant / Officer

Date: 28/05/2014

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Date: 5/6/2014

Supported by SCOT/SC

Sebastian Pasquallie

SCOT SC Chairperson

Date: 14-Aug-2014

PCM Reference/Name: **Execute Work**

SCOT Study Committee Number/Name: **Maintenance**

Content

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1. Introduction

The Task Manual has replaced the Work instructions within the Distribution Division. This has been done to assist the end users of these documents and the following is important to note:

- The contents of a Task Manual are always linked to the requirements of one or more Job Plans. In many instances only selected paragraphs / sections of the Task Manual will apply to a specific Job Plan.
- Task Manuals also form the main content of the training module for the task and therefore only people who have attended the training and assessed as competent should be assigned the task as described in the Task Manual.

This Task Manual was compiled from the **analysis** that was done on **critical tasks** that are being performed when maintaining or replacing the network equipment. The associated **risks and hazards** are identified so that they could be **addressed or remedied**.

2. Supporting clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to provide persons performing “Dismantling Of Overhead Lines Up To 132kV” with a step by step description of how to do the task, including the most critical hazards and technical specifications associated with the task.

2.1.2 Applicability

This Task manual is applicable to persons Dismantling Overhead Lines with different structures / poles in Eskom Holdings (Pty) Limited, it's divisions or Eskom wholly owned subsidiaries.

2.2 Normative/informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

2.2.1.1 International Document(s)

Document number	Document title	Preparer/author	Revision or date of issue
ISO 9001	Quality Management Systems.	-	Latest

2.2.1.2 South African National Document(s)

Document number	Document title	Preparer/author	Revision or date of issue
OHS Act No. 85	Occupational health and safety act and regulations	-	Latest
NRS 082	Recommended maintenance policy for electricity networks	Eskom	Latest

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2.2.1.3 Eskom National Document(s)

Document number	Document title	Preparer/author	Revision or date of issue
EPC_32-93	Vehicle and driver safety management	Eskom	Latest
EPC_32-846	Operating regulations for high voltage systems	Eskom	Latest
EPC_32 829	Wildlife interaction guideline (draft)	Eskom	Latest
EPC_32-418	Rev 0, Working AT Heights;	Eskom	Latest

2.2.1.4 Eskom divisional document(s)

Document number	Document title	Preparer/author	Revision or date of issue
DGL_34-256	Scheduling of driving activities	Eskom	Latest
DISASAAN0	Standard for the labelling of high voltage equipment	Eskom	Latest
DMN_34-2208	Access to work sites	Eskom	Latest
DPC_34-380	Identifying, analysing, documenting and observing tasks according to criticality	Eskom	Latest
DST_34-1462	Standard For The Selection, Care, Use, Inspection And Maintenance Of Conductive And Non-Conductive Ladders;	Eskom	Latest
DST_34-1150	Lifting machine operators training;	Eskom	Latest
DST_34-1131	Distribution Standard On Fall Arrest Systems;	Eskom	Latest
DISPVABI7	The Procedure for Manual Handling of Rural Line Poles;	Eskom	Latest
DST_34-1954;	Supervision of people in electrically hazardous locations:	Eskom	Latest
DMN_34-1402;	Fall Arrest System;	Eskom	Latest
-	Manufacturers manual		

2.2.1.5 Informative references

Document number	Document title	Preparer/author	Revision or date of issue
32-9	Definition of Eskom documents	Eskom	Latest
32-644	Eskom documentation management standard	Eskom	Latest
474-65	Operating manual of the Steering Committee of Wires Technologies (SCOWT)	Eskom	Latest
DST_34-1710	Provision and use of personal protective equipment	Eskom	Latest

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Document number	Document title	Preparer/author	Revision or date of issue
DPL_32-727	Safety, health, environment, and quality (SHEQ) policy	Eskom	Latest
DPC_34-227	Pre-task planning and feedback process	Eskom	Latest
DPL_34-1005	Environmental management policy	Eskom	Latest
DST_34-658	The use, care, maintenance and testing of high voltage operating sticks	Eskom	Latest
DPC_34-444	The Procedure for Use and Maintenance of Portable Earthing Gear;	Eskom	Latest
DPC_34-445	Standard For The Use Of Equipotential Earth Footplates;	Eskom	Latest
DPC_34-925	Procedure for refusal to work on the grounds of health, safety and environmental concerns;	Eskom	Latest
DGL_34-190	Access to Farms (includes Strategy on dealing with game farms);	Eskom	Latest

2.3 Definitions

2.3.1 General

All definitions listed in recognised industry glossaries such as NRS 000, ORHVS and IEV are applicable.

Definition	Explanation
Dangerous/ hazardous task	A specific element of work, which has produced and/or which possesses the potential to produce major loss or harm to people, assets, processes/production and/or the environment when performed properly.
Directive	A document which sets out a management objective, the appropriate policy if deemed necessary, as well as the functional accountability for activities to achieve that objective and the interface between functions affected by, or responsible for the execution of, such activities.
Risk assessment	This process involves the combined functions of hazards identification, risk analysis, risk evaluation, determining the risk control strategy/strategies and the identification of the risk control measures that will be implemented during the task execution.
Task analysis	The systematic examination of all dangerous/hazardous tasks (work) in order to identify and quantify all the potential and existing inherent hazards to which employees are exposed while the tasks are being executed.
NOTE: Only persons who have satisfied the designated person on terms of the Occupational Health and Safety Act (Act 85 of 1993) (General Machinery Regulation 2(1)) and Construction Regulation that their knowledge is adequate to perform specific duties on specified plant and that their knowledge of these regulations is sufficient may be authorised.	

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

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2.4 Abbreviations

Abbreviation	Explanation
ORHVS	Operating Regulation For High Voltage Systems
HV	High Voltage
OHSAct	Occupational Health and Safety Act
PTO	Principal Technical Official
STO	Senior Technical Official
TO	Technical Official
CO	**Construction Official**
SCO	**Senior Construction Official**
TCO	**Technical Construction Official**
PCO	**Principal Construction Official**
PPE	Personal protective equipment
ABC	Air Bundle Conductor
VMC	Vehicle Mounted Crane

2.5 Roles and responsibilities

The designated person or his delegate shall ensure that this procedure is implemented and adhered to. The authorised / responsible person is responsible for the safe execution of all work and activities as set out in this procedure.

2.6 Process for monitoring

Document number	Document title
-	Process Control Manual (PCM) for **Execute Work**
DPC_34-04	Procedure For Management Of Technical Documents For SCOT.

2.7 Related/supporting documents

a) Training module.

b) Manufacturer’s Manuals

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3. Task Execution

3.1 Pre-job Planning

NOTE: NOTE 1: Ensure that the resources / staff allocated this task have a good knowledge of the area, environment and the equipment they are to use.

NOTE: NOTE 2: In planning / making arrangements for this Job ensure that a proper stakeholders meeting is held to share the plan and how it is going to be executed.

a) Identify line that is to be dismantled.

b) Conduct the assessment at the site to determine the scope of work and the resources that would be required (people, equipment, PPE, etc.) as per DST_34-227.

c) Plan the work to be carried out and the resources ie material, people required for the safe execution of the task.

d) Ensure that informal settlement / dwellers / land owners and local authorities are notified about the project and the dates.

e) Identify all other crossings ie. other services / local authorities, structures in close proximity etc.

f) Ensure that a stake holders meeting is held and project plan is discussed.

g) Ensure that workers / resources to carry out the task are trained, tested and found to be competent to do the work.

3.2 On Site Risk Assessment

NOTE 1: Identify and analyse risks and hazards associated with the task, eliminate, minimise, develop measures against – i.e. compile procedures or provide PPE to safeguard maintenance staff.

a) Conduct on site risk assessment prior to commencement of work and continuous during the task execution as per DPC_34-227.

NOTE 2: Do not approach lines where low hanging conductors are present.

NOTE 3: Ensure that public is controlled at and around work site.

3.3 Site Preparation

NOTE 1: Before commencement of the task ensure that workers understand the task and what work / task is allocated to who and the line is isolated in terms of ORHVS.

NOTE 2: During inspection / site preparation ensure that control measures for access to work site are put in place.

NOTE 3: Where line clearances are within or can possibly encroach the safe working clearances then the close proximity requirements as stated in ORHVS are applicable.

a) Ensure that the apparatus is isolated, earthed and disconnected from the system in accordance to ORHVS.

b) Ensure that the relevant stake holders are present on the day of dismantlement ie. Police, Railways, Traffic dept, game farms etc.

c) Ensure that access routes and their control measures, permits / permission, barricades are in place.

d) Determine the condition of the line and environment impact before dismantling the line.

e) Ensure that the correct level of supervision as stated in DST_34-1954 is applied when executing the task and the responsible / authorized person are authorized in terms of ORHVS.

f) Ensure that ORHVS close proximity clause is applied where necessary.

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3.4 Dismantling / Removing Conductors

NOTE 1: Uncontrolled slacking of the conductor will result in structures / poles breaking, conductor whipping which poses a danger to workers.

NOTE 2: The inspection of the line must be done to determine any defects on all parts and devising measures to remove or dismantle them.

NOTE 3: Hardware being lowered shall be lowered through a hand-line.

a) Stabilize the structures as per the mitigating measures developed for identified risks.

b) Position the tool and equipment.

NOTE 4: Unbinding conductors on intermediate structures cannot be done where the line to be dismantled cross other lines.

NOTE 5: Take necessary precautions when dismantling the line that crosses other services.

NOTE 6: Equipment and all hardware lowered have to be properly secured onto the hand line.

c) Dismantle and remove line apparatus / equipment ie transformers, breakers e.t.c from the line prior to dismantling the line.

d) Remove the binding on suspension structures.

e) At strain structure attach pulling devices to all conductors to be removed as well as control rope and conductor grip.

NOTE 7: No conductor may be cut whilst under tension.

f) Take up tension with appropriate pulling devices and disconnect conductor from strain structure.

NOTE 8: Ensure that the weight of the conductor has been taken into consideration when lowering it manually.

g) Release pulling device while maintaining physical tension on rope.

h) Disconnect pulling device from conductor and lower conductor to ground while maintaining tension on rope.

i) Roll the stay conductor into manageable coils and remove it from the work site.

3.5 Removal of structures

NOTE 1: High risk structures shall be properly supported before dismantling them and remove all additional material ie. Transformers, insulators etc from structures / poles before this task can commence.

NOTE 2: In the event of using a vehicle mounted crane ensure adherence to operating a VMC Task Analysis & Task Manual documents.

NOTE 3: After removing lattice and big steel structures the plinths shall also be demolished.

NOTE 4: No stumps and or stay rods resulting from structure being cut shall be left in the ground and all excavation shall be backfilled immediately.

NOTE 5: Safe tree-felling method can be adopted to remove wood poles.

NOTE 6: Strict supervision shall be maintained during the task execution.

3.5.1 Scenario 1: Using Crane

a) Support and / or control the structure as follows:

- Apply a chain or nylon sling on the structure / pole, ensure that the sling is positioned at approximately one third of the structure / pole length from the top or two thirds from the ground level
- For lattice structure the lifting sling could be attached to the cross arm or beam
- Apply at least two guide ropes at the bottom of the structure / pole, this must be guided in opposite directions
- Raise the crane to take tension on the sling.

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b) In case of lattice and steel mono-pole structures follow the next steps:

NOTE 7: The big lattice structures shall be dismantled in sections from the top.

- Remove pole base securing bolts or cut the bolts off with cutting torch if required.
- Lift and remove the structure from plinths.
- Lay the structure on the ground, dismantle and remove the structure parts.
- Demolish the plinths into manageable pieces, remove the debris and backfill the excavations and rehabilitate the soil.

c) In case of wooden, concrete and steel poles which are compacted follow the next step:

- For wooden poles, cut the poles a meter high from ground level, lift, lay to ground, cut to manageable pieces if required and remove.
- Excavate the soil around stumps, remove the stumps and backfill the excavation.
- For concrete poles excavate around the structure until it is loose and remove it from the hole.
- For steel poles excavate around the structure until it is loose and remove it from the hole.
- Backfill the excavations and rehabilitate the soil.

d) In case of steel poles which are bolted follow the next step:

- Remove the pole securing bolts and remove it from the base.
- Excavate the concrete base / foundation and remove it from the hole.
- Backfill the excavations and rehabilitate the soil.

3.5.2 Scenario 2: Tree felling

NOTE 1: Ropes used to pull the pole must be longer than the poles being felt to ensure that people pulling the pole down are at safe distance or out of the danger zone ,

a) Attach a rope to the top end of the pole, pull the rope to guide the pole towards the desired fall direction.

b) Cut (V Cut) the pole at the predetermined position and clear the area as the pole starts to break.

3.6 Removal of stays

a) Dismantle and remove the stays.

b) Excavate the stay rod and backfill the excavation.

NOTE 1: No stay rod shall be left in the ground after removing stays and all excavation shall be backfilled immediately.

c) Roll the stay wire into manageable coils and remove it from the work site.

3.7 Task Wrap Up

a) Ensure that the work site / environment is left free of debris or contaminants.

NOTE 1: Ensure that all material removed are well secured when they are being transported from site.

NOTE 2: Ensure that the dismantled line material is properly secured while being transported from the site.

b) Remove all personnel, equipment and redundant material from site.

c) Complete and submit required documentation.

NOTE 3: Clean work area at the completion of the job – because leaving off-cuts and material may result in injuries to the public/livestock and damage to the image of Eskom.

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4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Prince Moyo	Power Delivery Engineering GM
Colin Smith	Design Base Maintenance Manager
Sebastian Pasquallie	SCOT SC Chairperson
David Ntombela / Frans Lötter	Consultant / Officer Technical Support

5. Revisions

This revision cancels and replaces revision no 0 of task manual number DMN_34-2120.

Date	Rev.	Compiler	Remarks
Aug 2014	1	F Lötter & DM Ntombela	Reviewed, Registered and published the document as 240-77090523
May 2010	0	F Lötter & DM Ntombela	Document approved as DMN_34-2120

6. Development team

The following people were involved in reviewing this document:

Name	Designation	Department/OU
D M Ntombela	Consultant	PDE DBO
S P de Bruin	Senior Supervisor	NW OU
F van Jaarsveld	Officer Technical Support	KZN OU
D F B Lötter	Officer Technical Support	WC OU
J E van Wyngaard	Officer Technical Support	EC OU
J J B Uys (Chairperson)	Senior Supervisor	FS OU
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S Delport	SHE Officer	MP OU
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7. Acknowledgements

N/A.

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Annex A – Impact assessment

1 Guidelines

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

2 Critical points

2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, optimized costs.

Comment: Statutory requirements and or document revisions

2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

Comment: No impact on statutory or legal compliance and mainly document revisions

2.3 Impact on stock holding and depletion of existing stock prior to switch over.

Comment: N/A - No new equipment or item need to be acquired for implementation of this document.

2.4 When will new stock be available?

Comment: N/A –see 2.3 above.

2.5 Has the interchange ability of the product or item been verified - i.e. when it fails is a straight swap possible with a competitor's product?

Comment: N/A – It is a maintenance document and also see 2.3 above.

2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

Comment: Consult / Refer to SCSASABA8 for revised earth application when implementing the document.

2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

Comment: None.

3 Implementation timeframe

3.1 Time period for implementation of requirements.

Comment: N/A – No technical changes were made to this document.

3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

Comment: None.

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4 Buyers Guide and Power Office

4.1 Does the Buyers Guide or Buyers List need updating?

Comment: NO.

4.2 Buyer's Guides or items have been created?

Comment: NONE.

4.3 List all assembly drawing changes that have been revised in conjunction with this document.

Comment: NONE – The configuration hasn't changed.

4.4 If the implementation of this document requires assessment by CAP, provide details under 5

Comment: N/A – The revision requires no new equipment.

4.5 Which Power Office packages have been created, modified or removed?

Comment: NONE:

5 CAP / LAP Pre-Qualification Process related impacts

a.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

Comment: NO

5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

Comment: N/A – The document doesn't specify but stipulated the maintenance procedures on the existing equipment.

5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

Comment: N/A – The specification document is the document supplied to the suppliers not this one.

5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: Yes – This is the revision of document that is presently being implemented and requires no change to the supplier's qualification period.

5.5 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

Comment: N/A – see 5.4 above.

5.6 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: N/A – see 5.4 above.

5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: N/A – No new material is required.

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5.8 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

Comment: N/A – No new material is required.

6 Training or communication

6.1 State the level of training or communication required to implement this document. (E.g. none, communiqués, awareness training, practical / on job, module, etc.)

Comment: Practical / On job and training module.

6.2 State designations of personnel that will require training.

Comment: TSO, PTO & STO.

6.3 Is the training material available? Identify person responsible for the development of training material.

Comment: Yes – DT- Training is revising earthing related training manual which will address the changes in this document.

6.4 If applicable, provide details of training that will take place. (E.G. sponsor, costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

Comment: Safety and Maintenance training.

6.5 Was Training & Development Section consulted w.r.t training requirements?

Comment: Yes.

7 Special tools, equipment, software

7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

Comment: NONE.

7.2 Are there stock numbers available for the new equipment?

Comment: N/A – No new equipment is required.

7.3 What will be the costs of these special tools, equipment, software?

Comment: N/A – No new equipment is required.

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8 Finances

8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment:

No costs other than the training will be incurred by the regions and this will depend on the arrangements made for training ie Training is held regionally or nationally.

Impact assessment completed by:

Name: David M. Ntombela_____

Designation: Senior Technician_____

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Annex B– Observation Form

Eskom Distribution	**FORM TITLE**	**OBSERVATION FORM**		
	FORM NUMBER	240-77090523	REV DATE	August 2019
	DOCUMENT TITLE	DISMANTLING OF OVERHEAD LINES		

1. OBSERVER'S PARTICULARS

Task observer's name: _____ Task observed: DISMANTLING OF OVERHEAD LINES

Section / department: _____ Location: _____

Occupation: _____ Is there a procedure / task manual for this task? YES ☐ NO ☐

Date: _____ Task Manual ref. _ 240-77090523 _ _____

Time with task: _____ Work order no.: _____

2. REASON FOR OBSERVATION

Planned: ☐ Follow-up: ☐

Name of employee being observed:

3. TASK OBSERVATION

Did employee adhere to the procedure/practice requirements?

	Yes	No	N/A		Yes	No	N/A
1. Preplanning carried out correctly				4. Use of correct PPE			
2. Emergency contacts numbers Obtained				5. Ensure that the panel / equipment to be commissioned is isolated and earthed in accordance with EPC_32-846			

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Annex B
(continued)

3. Tools equipment:				6. Carry out the task as per task manual 240-77090523				
a) Used correctly								
b) In good and safe condition								
c) Test instrument calibrated								
4. Toolbox Talk:								
a) Task manuals used								
b) Complete Worker's register								
c) Risk Assessment been done								
d) Valid work permits available								
Could observed practices / conditions lead to:								
1. Injury:				2. Illness (fumes, gas, etc.)				
a) Risk of getting caught by				3. Costs (delays)				
b) Risk of striking against/get struck by				4. Poor quality (non-conformance)				
c) Risk of fall from same level								
d) Risk of fall from different level								
e) Risk of slip, trips and falls								
f) Risk of electrocution								

4. NON COMPLIANCE PRACTICE OBSERVATION

	Yes	No	N/A		Yes	No	N/A
1. Working at unsafe speed				7.Failure to warn			
2. Using unsafe equipment				8. Taking chances			
3. Using equipment unsafely				9. Failure to identify hazards			
4. Unsafe loading, placing & lifting				10.Failure to secure lock-out			

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Annex B
(continued)

	5. Taking unsafe position				11. Safety signs ignored				
	6. Safety rules ignored								
	NOTE: ALL OBSERVED CLASS HAZARDS SHALL REQUIRE IMMEDIATE INTERVENTION								
5.	**OBSERVED DEVIATIONS / NON-CONFORMANCES**								
6.	**RISK BEHAVIOURS**								

7.	**PROPOSED CONTROLS**						
	Compile a procedure for this task		Issue a standing instruction				
	Revise present procedure		Change work methods				
	Retraining of employees		Professional referral				
	Engineering revision		Coaching				

8.	**ANALYSIS**							
	IAC – inadequate capability		ABU – abuse or misuse / equip / drugs or alcohol		MAIN – inadequate maintenance			
	KNO – lack of knowledge		NAT – natural factors		EQU – inadequate equipment			
	SKI – lack of skill		LEA – inadequate leadership		STA – inadequate work / train Standards			
	STR – stress		ENG – inadequate engineering		WEA – wear & tear			
	MOT – improper motivation		PUR – inadequate purchasing		CON – inadequate control			

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Annex B
(continued)

9.	**DISCUSSION BETWEEN SUPERVISOR/OBSERVER AND EMPLOYEE**	
	1. EMPLOYEE EXPLANATION FOR RISK BEHAVIOUR:	
	2. AGREEMENT TO CHANGE AT RISK BEHAVIOUR:	
10.	**FOLLOW-UP ACTIONS**	**WHEN / WHO**

Person being Observed signature: _____ Date: _____

Signature (Task Observer): _____ Date: _____

Signature Chairperson Safety Committee: _____ Date: _____
(if deviations were found)

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