

Title:	PPE Requirements for Work i	PE Requirements for Work in Proximity to Electrical Equipment SOP									
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Area No:		Review Date:	July 2025								

### Standard Operating Procedure

#### 1 Introduction and Purpose

The following in conjunction with the Arc Flash risk matrix, JHA and Electrical switching checklists /SOP's describes PPE required during routine or maintenance operations on electrical equipment across all Todd Energy facilities.

The procedure is designed to be used while carrying out Permit to Work preparation activities, particularly in <u>Electrical Safety Rules Manual</u>.

WARNING. Must ensure equipment does try to start either automatically or manually when switching activities are being performed. Effective communications with the Control room should mitigate this risk.

#### 2 Scope

The procedure is to be used across all Todd Energy facilities where routine operations or maintenance work is performed in close proximity to the following equipment:

- High voltage (greater than 1000VAC) electrical equipment including HV (typically 11kV-110KV) substations, switch- rooms, switchgear, Motor Control Centres, Variable Speed Drives and Distribution Boards where applicable.
- Power transformers (>90kVA) including HV and LV cable termination compartments and ancillary equipment compartments.
- Low voltage switchgear including substations, switch-rooms, and switchgear.
- Motor control centres including isolation/de-isolation of incoming/outgoing circuits.
- Distribution boards only where the primary safeguard cover is to be removed for internal access to the board (i.e., where live busbars or terminals are exposed)
- Testing of any of the above equipment to determine its energised state (live or dead)
- DC Systems.



This procedure does not cover:

- Any equipment listed above that has been removed from service for maintenance and/or proven to be electrically isolated.
- Operation of Miniature Circuit Breakers in any Distribution board where the primary safeguarding cover remains in place (i.e., there is no access to live busbars or terminals)
- Maintenance or switching of any portable or permanently connected tool, domestic or commercial appliance.
- Portable equipment.

#### 3 References, Definitions and Abbreviations

Doc. No. TE 6200TECD72101787 Electrical Safety Rules Manual

PTW Checklist 44 High Voltage (11KV) Electrical Switching

PTW Checklist 32 Live Electrical Work

#### 4 Safety and Competency

#### 4.1 Personnel Requirements

All persons working within Electrical areas on site shall have a basic understanding of arc flash awareness, where and when there is a likelihood of exposure.

All persons required to use PPE above Hazard Category level 1 (Cat 1) from Arc Flash risk matrix shall be competent in the use of the PPE and have knowledge on how to carry out integrity checks of the PPE required prior to its use.

Based on work responsibility and area, people shall pass one of the KEA Arc Flash training modules as described in "Electrical Safety Rules Manual, Section 13.0". Competency will be recorded in CMS.

# 4.2 Permit Issuers shall be fully aware of arc flash hazards and ensure that the required controls are in place using appropriate documentation to mitigate the risk. Safety Requirements

The supervisor responsible for the work carried out using this procedure shall:

- 1. Determine that all personnel carrying out the work are competent to do so.
- 2. Ensure that the requirements contained in this procedure are communicated and understood.

The person responsible for carrying out work using this procedure shall:

- 1. Study the requirements in this procedure and ensure they are competent to carry out the activities they are to perform.
- 2. Ensure that all work is carried out in a safe manner.



#### 5 Procedure

#### 5.1 General

The procedure comprises of three sets of tables all of which are referenced as examples in Appendix A. Each Facility has two tables capturing the PPE requirements for the electrical equipment as per the description below, the third table, listing the required PPE equipment, applies to all facilities. Note that the information in Appendix A is included for example and training purposes only, up to date information can be found in Sauce controlled Doc's or the physical copies of the arc flash matrices located inside the switchgear rooms as well as in the permit issuer's office.

**Asset Table 1** – This table lists the activities associated with the various switchboards and switchgear i.e., MSB's and MCCs. The table comprises of an activity list describing, specific tasks and conditions in the left-hand columns, and site/area/equipment items as the table column headers. The body of the table shows the Arc Flash Hazard Category of PPE required to complete the described task on the specific equipment item.

**Asset Table 2** – This table lists the activities associated with 11kV/400V power transformers, on site emergency generators and DOL motors. The table comprises of an activity list describing, specific tasks and conditions in the left-hand columns, and site/area/equipment items as the table column headers. The body of the table shows the Arc Flash Hazard Category of PPE required to complete the described task on the specific equipment item.

**Note:** For electrical distribution boards, lighting panels, and panel boards not listed in the abovementioned Tables, including equipment associated with DC systems, refer to tasks/equipment type tables in Appendix B

**Table 3** lists the PPE equipment required for each Arc Flash Hazard Category identified in Table 1& 2 and applies across all Facilities.

#### 5.2 **PPE Inspection Requirements**

A thorough visual inspection of the arc flash PPE shall be performed prior to each use to determine obvious defects and anomalies. All visual checks prior to use will be recorded on the arc flash PPE register, located inside the arc flash PPE lockers.

As a minimum the visual inspection will be performed at least once per year on all arc flash PPE.

Note: HV switching gloves are sent away for external testing every 6 months Inspection date should be within last 6-month period

Should any defects be detected during normal inspection or, the equipment is exposed to arc flash the electrical TA shall be informed and arrange replacement of damaged equipment.



#### 5.3 Identify PPE Requirement

To identify Arc Flash PPE requirements for electrical maintenance tasks, refer to the arc flash matrices which are located at the electrical equipment location and may be found in the Permit Control Facility for the asset:

- Identify the site relevant Arc Flash Task/Hazard Category matrix.
- Using the "Site/Area/Equipment" columns in the respective site Arc Flash Task/Hazard Category Matrix locate the column related to the electrical equipment to be worked on.
- Using the left-hand columns in Table 1, select the activity to be performed in the "Task Description" column, followed by the relevant equipment condition in the "Condition(s)" column.
- Where the row selected in step 2 and the column selected in step 1 intersect, the Arc Flash Hazard Category of the task is shown.
- Using the Arc Flash Hazard Category number from Table 1/2, use Table 3 to identify what PPE is to be worn while performing the task.
- Where an electrical distribution board is not listed on the matrices held at the asset Permit Control Facility, refer to the table in Appendix B for guidance.

#### 6 Extract from KPS

1

#### Table 1 – Arc Flash Hazard Category Matrix

#### **Task and Condition Column**

#### Site / Area / Equipment

			КАР	UNI PROD	UC.	тю	N STA	TION 8	REMO	TE WE	LLSIT
	TASK DESCRIPTION	CONDITION(S)					KA-18	\$ 7		KA-2	KA-3
TASK #			1/2	MCC-101 / 102 (Incomer)	101	1/	W1-1	CGG OV Panel	DB- 1- W17	DB-1- W2	DB-1- W3
	SWITCHGEAF	RACTIVITIES									
	Inspection of substation / switchroom		1 <sup>Note</sup> H	1 <sup>Note H</sup>	1 <sup>N</sup> H	ote	1 <sup>Note</sup> H				
2	Inspection of equipment (switchgear, transformer, motor)		1 <sup>Note</sup> H	1 <sup>Note H</sup>	1 <sup>N0</sup> H	ote	1 <sup>Note</sup> H				
_		Local	1	N/A	1		2	N/A	1	1	1
	Operation of bus tie & outgoing CB's or switches	Remote	N/A	N/A	N//		N/A	N/A	N/A	N/A	N/A

#### Table 2 – Hazard Category PPE Matrix Arc Flash Hazard Category

Protective Equipment	Hazard Category number							
	0/1	2	3	4+				
FR Coverall (4Cal/cm <sup>2</sup> )	V	V	V	N				
12Cal/cm <sup>2</sup> flash suit		~						
30Cal/cm <sup>2</sup> flash suit			V					
40Cal/cm² flash suit				N				
Safety Glasses	~							
Wrap-around type arc-rated face shield*		~						
Flash suit hood*			V	V				
Hard Hat								
Arc Flash Gloves Category 2	-							
Arc Flash Gloves Category 4			1	V				
Hearing protection		~	~	V				
Safety boots/shoes	V	~	~	~				
* including integral safety glasses								
√ = minimum required								
Notes:								
The combination of face-shield, safety glasses, lea	ather gloves an	d non-me	elting und	erwear				
Clothing meeting ASTM F 1959, 2002; Standar								
Rating of Face Protective Products; is tested to de			level at w	hich th				
material provides adequ	ate protection.							



#### **Example No. 1** (Using the table extract above)

Electrical isolation is required on the KPS Reboiler Pump, P-5012A. The pump is to be switched off at the MCC cell, and an isolation tag fitted. Pump motor is supplied from the MCC-101/102.

Using the left-hand column of the example KPS Table 1 (Appendix A) the task will be "Operation of bus time & outgoing CBs or switches" (circled in red) As the operator is required to switch the motor at the MCC cell, the condition will be "Local".

Using the column headers in the KPS Table 1, we find the column related to "KPS, MCC-101/102" (circled in red)

At the row and column intersect we find "1" (Cat 1) as the stated Arc Flash Hazard Category for the task (circled in red).

Using Table 3 (Hazard Category/PPE Matrix) we see the following PPE is required to perform the task:

Fire Retardant Overalls

Safety Glasses

Hard Hat

Safety Boots/shoes.

Note that this PPE will be required when performing the isolation, (operating the switch), and again when turning the switch back on.

#### Appendix 1: Example Arc Flash Matrices

Refer to HSE dept. website or copies located in MCC for up-to-date information.

KPS - Kapuni Production Station & Remote Well Sites

Table 3 – Task / Hazard Category Matrix – Switchgear Activities

	KPS AR	C FLASH - TAS	K / H	AZAR	D CA	ΓEGO	RY M	ATRIX	X								Pag	je 22
NST	RUCTIONS																Rev	/ 1
	lect activity to be performed in the " column																	
	cate electrical equipment the activity be performed on	Number of Hazard category 4	1	3	0	0	0	0 0	) (	0	0	0	0	0		0	0	
Inte Juip Jumb	ersect point between task & electrical ment shows arc flash Hazard Cat. ber	Number of Hazard category 3	2	0	0	0	0	0 0	) (	) 0	0	0	0	-C	) (°	0	0	
ter	e the Hazard Category number to nine minimum arc flash PPE required e task	Number of Hazard category 2	0	0	0	3	3	0 0	) (	) 0	0	F		0	0	0	0	
					KAF	PUNI PRO	DUCTION		N & REMO		LSITES							
	TASK DESCRIPTION	CONDITION(S)		KPS			KA-1 & 7		KA-2		4&14	KA-5 & 1	0	KA-6 & 1 <sup>-</sup>	і кл	A-8 & 12 8	& 15 KA	-13
			MCC-1 / 2	MCC-101 / 102 (Incomer)	/ 102	MSB- W1-1	CGG OV Panel	DB-1-	<b>RE 1-</b>			MSB- DB- 510 W5 <sup>7</sup>				C- MS 3-1 W8		-W13
	SWITCHGEAR	ACTIVITIES																
	Inspection of substation / switchroom		1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 Note H	A pte H	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note</sup>				
	Inspection of equipment (switchgear, transformer, motor)		1 <sup>Note H</sup>	1Note H	1 Note H	1 Net H	1 Note H	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note H</sup>	1 <sup>Note</sup>				
	Inspection of outgoing	Compartment door is closed	N/A	NA .	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	isolation switches & feeder cubicles internally	If compartment door cannot be closed or if work is done in fixed unit	3	N/A	1	2	2	1	1	1	1	1	1	2	1	4	1	1
	Inspection of incoming CBs	Compartment loor is	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	and cubicles internally	t compartment door cannot be closed or if work is done on fixed unit	4	4	N/A	2	2	1	1	1	1	1	1	2	1	4	1	1
Inspection measuring busbar	Inspection measuring busbar current transformers	Complete busbar isolated	1 <sup>Note G</sup>	N/A	1 <sup>Note G</sup>	1 <sup>Note G</sup>	N/A	N/A	N/A	N/A	N/A	1 <sup>Note G</sup>	N/A	1 <sup>Note G</sup>	N/A	1 <sup>Note G</sup>	N/A	N/A
		Multiple section board		N/A	<b>1Note G</b>		N/A	N/A	N/A			N/A						N/A



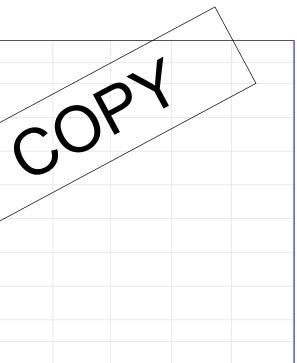
6	Access LV Switchgear control compartment (LV		N/A	1	1	N/A	2	N/A	NA	N/A	N/A							
	Relay Compartment)																	
7	Modify protection relay settings		N/A	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Local	1	1	N/A	2	N/A	1	1	1	1	1	1	1		1	1	1
3	Operation of incoming CB	Remote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Local	1	N/A	1	2	N/A	1	1	1	1	1	1		1	1	1	1
9	Operation of bus tie & outgoing CB's or switches	Remote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NIA	N/A	N/A	N/A	N/A	N/A	N/A
		With doors closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A
10	Rack in/out Incomer CB	With doors open	N/A	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MA	N/A	N/A	N/A	N/A	N/A	N/A
		With doors closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	n/A	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	Rack in/out CB's, or removal of motor starter & outgoing feeder cubicles	With doors open	3	N/A	1	N/A	N/A	N/A		N/A	N/A	N/A	N/A	2	N/A	4	N/A	N/A
12	Test and measure cable connection tightness for outgoing feeders.		1 <sup>Note G</sup>	N/A	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 Note	A pro 4	1 Note G	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>						
13	Test incomer / bus-tie spouts are dead	Horizontal / Vertical spout configuration	1 <sup>Note A</sup>	1 <sup>Note F</sup>	N/A		Note A	1 <sup>Note A</sup>	1 <sup>Note B</sup>	1 <sup>Note A</sup>	1 <sup>Note E</sup>	1 <sup>Note A</sup>	1 <sup>Note A</sup>					
14	Test circuit spouts are dead	Horizontal/Vertical spout configuration	1 <sup>Note D</sup>	N/A	1 Note A	Note A	1 Note A	1 <sup>Note A</sup>	1 <sup>Note A</sup>	1 <sup>Note A</sup>								
		Via earth switch that is interlocked,	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	Earth circuit / incomer spouts	By hand using portable earthing equipment	N té G	Note G	N/A	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>
		Via moving B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	Earth outgoing feeder circuit spouts	By band using portable authing equipment	1 <sup>Note G</sup>	N/A	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>
17	Check synchronism between circuits by applying synch-check on live sports	PL.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Test in ulation of cable via	Connecting lead to the spouts	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>
	circuit stouts	Test itself	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>	1 <sup>Note G</sup>
19	Removal and replacement of fuses in Switch panel		N/A	N/A	N/A	1 <sup>Note C</sup> & I	N/A	N/A	N/A	N/A	N/A	1 <sup>Note I</sup>	N/A	N/A	N/A	1 <sup>Note C</sup> & E	N/A	N/A



#### Notes:

Note A - Extended-Reach Test Probe shall be used as standard procedure during testing procedures.	
Note B - Extended-Reach Test Probe must be used. The probe has to be long enough to increase the working distance to at least 720mm. The length is rounded to the next size probe available.	
Note C - Extended-Reach Test Probe must be used. The probe has to be long enough to increase the working distance to at least 1070mm. The length is rounded to the next size probe available.	
Note D - Extended-Reach Test Probe must be used. The probe has to be long enough to increase the working distance to at least 1400mm. The length is rounded to the next size probe available.	
Note E - Extended-Reach Test Probe must be used. The probe has to be long enough to increase the working distance to at least 1480mm. The length is rounded to the next size probe available.	と
Note F - Extended-Reach Test Probe must be used. The probe has to be long enough to increase the working distance to at least 1520mm. The length is rounded to the next size probe available.	
Note G - This assessment sheet assumes that busbar / equipment / circuit spouts previously proven to be electrically isolated, and cable discharged, therefore zero potential.	
Note H - Personnel to take note of signage and stay clear of marked area (Arc Flash Boundary) as far as possible during inspection.	
Note I - Extended-reach fuse extractors to be used as required.	
N/A = Task is not assessed since it is not applicable to the equipment being worked on.	
EXAMPLE	





#### Appendix 2: KPS - Kapuni Production Station & Remote Well Sites

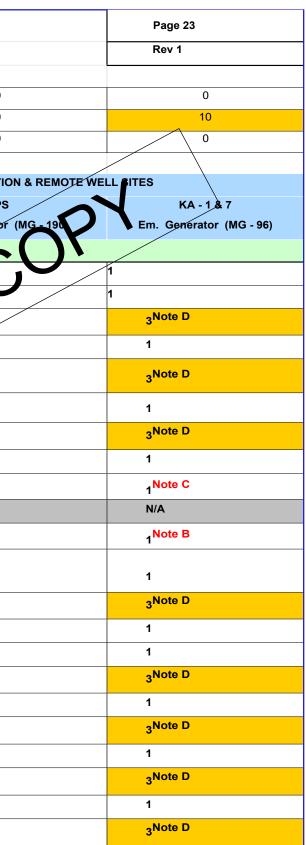
Table 4 – Task / Hazard Category Matrix – Transformer / Motor / Generator Activities

	KPS ARC FLASH - TA	SK / HAZARD CATEGOR	RY MATRIX	
INSTRUC	TIONS			
1. Select	activity to be performed in the "Task" column			
2. Locate	electrical equipment the activity is to be performed on	Number of Hazard category 4	0	0
3. Interse	ct point between task & electrical equipment shows arc flash Hazard Category Number	Number of Hazard category 3	0	0
4.Use the	Hazard Category number to determine minimum arc flash PPE required for the task	Number of Hazard category 2	0	0
TA 01/ #			KAPUN	I PRODUCTION STATIC
TASK #	TASK DESCRIPTION	CONDITION(S)	KPS Em. Generator (MG - 150)	KPS Em. Generator
	TRANSFORMERS / MOTOR / GENERATORS ACTIVITIES			
1	Inspection of Equipment Compound		1	1
2	Inspection of Equipment		1	
3	Internal inspection, measurement & testing of main cable terminations	Equipment Online	1 <sup>Note D</sup>	Not D
		Equipment Offline	1	1
4	Modify auxiliary control / protection devices e.g., temperature switches, pressure switches, thermistors, control panel, startup batteries	Equipment Online	Note D	1 <sup>Note D</sup>
		Equipment Offline	1KV	1
5	Test & measure cable connection tightness	Equipment Online	1 Note D	1 <sup>Note D</sup>
		Equipment Offline	-1	1
6	Test phase rotation (via terminals)	Equipment Online	1 <sup>Note A</sup>	1 <sup>Note A</sup> N/A
7	Test terminations are dead	Equipment Offline		
1	/	Equipment Online	1 <sup>Note A</sup>	1 <sup>Note A</sup>
8	Earth main electrical terminations. By hand using portable earthing equipment	Equipment Offline	1	1
	Access LV auxiliary connection compartment (Generator interface junction bix)	Equipment Online	-	•
9	Access LV auxiliary connection compartment (Generator Interface Junction bix)		1 <sup>Note D</sup>	1 <sup>Note D</sup>
		Equipment Offline	1	1
10	Insulation Resistance Testing	Equipment Offline	1	1
11	Minor restoration of equipment housing	Equipment Online	1 <sup>Note D</sup>	1 <sup>Note D</sup>
		Equipment Offline	1	1
12	Major restoration of equipment (reusing bearings, etc)	Equipment Online	1 <sup>Note D</sup>	1 <sup>Note D</sup>
		Equipment Offline	1	1
13	Oil sample ollection	Equipment Online	1 <sup>Note D</sup>	1 <sup>Note D</sup>
		Equipment Offline	1	1
		Equipment Online	1 <sup>Note D</sup>	1 <sup>Note D</sup>

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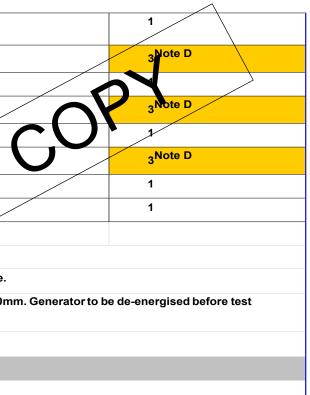




#### PPE Requirements for Work in Proximity to Electrical Equipment SOP

Equipment Offline Equipment Online Equipment Offline Equipment Online Equipment Offline Equipment Online		1 1 <sup>Note D</sup> 1							
Equipment Offline Equipment Online Equipment Offline Equipment Online		•		1					
Equipment Online Equipment Offline Equipment Online		1		1 <sup>Note D</sup>					
Equipment Offline Equipment Online		-		1					
Equipment Online		1 <sup>Note D</sup>		1 <sup>Note D</sup>					
		1		1					
		1 <sup>Note D</sup>		1 Note P					
Equipment Offline		1							
Equipment Online		1							
			<b>ハ</b> レ						
rocedures.									
ase the working distan	nce to at least 940	mm. The length is stunde	ed to the next size pr	robe available					
Note C - Extended-Reach Test Equipment must be used. The test equipment shall be connected whilst the generator is offline. The test will be conducted with a working distance of greater than 940min equipment is removed.									
Note D - This equipment is running only occasionally hence it is safer and more preferable to perform this task when the equipment is offline.									
	$\langle \cdot \rangle$								







#### Appendix 3: Example Hazard Category/PPE Matrix

Refer to HSE dept. website or copies located in MCC for up-to-date information.

Protective Equipment	Hazard C	Category (	Cat) numbe	er 🔨
	0/1	2	3	4+
FR Coverall (4Cal/cm <sup>2</sup> )	$\checkmark$	$\checkmark$	Y P	N
12Cal/cm <sup>2</sup> arc flash suit		V	<u>(</u> , <u></u> , <u></u> )	
40Cal/cm <sup>2</sup> arc flash suit		602	V	$\checkmark$
Safety Glasses	RU			
Wrap-around type arc-rated face shield		$\checkmark$		
Flash suit hood			$\checkmark$	$\checkmark$
ING				
Hard Hat	$\checkmark$	$\checkmark$		
-NL'				
Category 2 Arc Flash Gloves (or leather gloves)		$\checkmark$		
Category 4 Arc Flash Gloves (or leather gloves)			$\checkmark$	$\checkmark$
Standard Tody Anergy gloves	$\checkmark$			
CEXN.				
Heating protection		$\checkmark$	$\checkmark$	$\checkmark$
Safety boots/shoes	$\checkmark$	$\checkmark$	$\checkmark$	

#### Table 5 - ARC FLASH MANAGEMENT SYSTEM – Hazard Category/PPE Matrix

 $\sqrt{1}$  = minimum required Notes:

The combination of face-shield, safety glasses, leather gloves and non-melting underwear (T-shirt and shorts) plus either FR coverall or shirt and trousers (pants) gives protection up to and including hazard category 2 i.e., 8Cal/cm<sup>2</sup> – per NFPA 70E table 130.7(C)(10).

Clothing meeting ASTM F 1959, 2002; Standard Test Method for Determining the Arc Rating of Face Protective Products; is tested to determine the arc energy level at which the material provides adequate protection.



#### Appendix 4 – Distribution Boards, Lighting Panels and Panel Boards

For electrical boards not listed in any of the matrices at the asset Permit Control Facility, refer to the following tables.

Task	Hazard/ Risk Category
Circuit breaker (CB) or fused switch operation with covers on	1
CB or fused switch operation with covers off	1
Work on energized parts, including voltage testing	1
Remove/install CBs or fused switches	1
Removal of bolted covers (to expose bare, energized parts)	1
Opening hinged covers (to expose bare, energized parts)	1

		1
Table 6 – Distribution Boards,	lighting panels, and panel	boards rated 240Vac and below '

## Table 7 – Distribution Boards, lighting panels, and panel boards rated >240Vac and up to 600Vac (with mouldedcase or insulated case circuit breakers)1

Task	Hazard/ Risk Category
CB or fused switch operation with covers on	1
CB or fused switch operation with covers off	1
Work on energized parts, including voltage testing	1

### Table 8 – Battery Chargers, Battery Banks and Distribution Boards associated with DC distribution systems rated >12VDC and up to 240VDC.

Task	Hazard/ Risk Category
CB or fused switch operation with covers on	1
CB or fused switch operation with covers off	1
Work on energized parts, including voltage testing	1

<sup>1</sup> Table referenced from NFPA 70E, 2004 Edition, Table 130.7(C)(9)(a) – Hazard/Risk Category Classifications



#### **Revision and Approval Details**

<u>Revisio</u> <u>n</u>	Published Date	Reason for Issue	<u>Author</u>	Reviewer	Reviewed Date	Approver	Approved Date	Document Initiated
1	17/06/202 1 1:51:11 PM	Approve d for Use		Alex Wishart;Darryl Wai;Dion West	26/05/202 1 12:00:00 AM	Alex Wishar t	17/06/202 1 11:31:55 AM	26/05/202 1 8:41:03 AM
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