



THE MODERN UNIVERSITY ESTATE

ENGINEERING AND
ENVIRONMENTAL COMPLIANCE

ANNUAL CONFERENCE 2025

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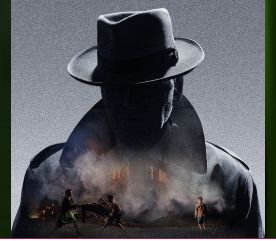
THORN

ZUMTOBEL

An Inspector Calls

Ray Scanlan
Authorising Engineer

An Inspector Calls

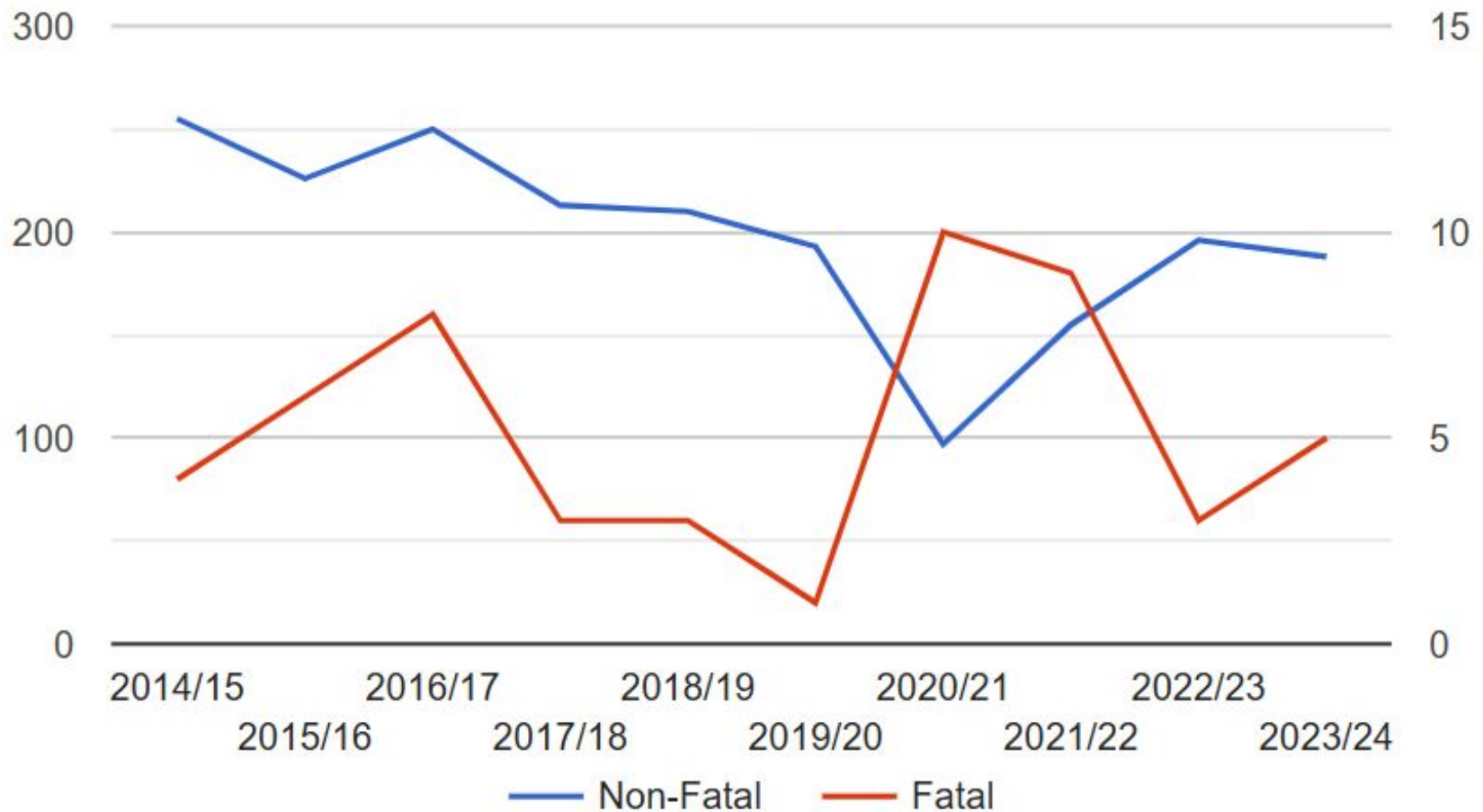


- Real-life Experiences – Anonymity Please
- Filming will be Anonymised 👍
- Questions? 🤔
- Dramatic Interlude! 🎭 🎩

An Inspector Calls



HSE Electrical Injury and Fatality Statistics



An Inspector Calls



HSE performance during 2023/24 at a glance

Enforcement action

Completed **248** criminal prosecutions with a **92%** conviction rate

Issued over **7,000** notices including approximately:

5,200 notices for improvement

1,800 notices prohibiting work activity placing people at risk of death or serious injury

Completed **84%** of fatal investigations within 12 months of receiving primacy, against our target of **80%**

Business Plan delivery

Over **14,700** inspections completed including:

Approx. **1000** HSE
Inspectors in the
UK



An Inspector Calls



Our AIM for the future?

- Estates Senior Staff are very well prepared if An Inspector was ever to call. 😬
- Look after your people and your equipment & installations and there's never any need to call. 🙅

An Inspector Calls



Objectives Today

1. Provide us all with a practical demonstration of:-
 - When would an Inspector call?..
 - And a real-life “Inspector’s Interview”.
2. Define the HSE Electrical Inspector’s 6 priority compliance requirements at your site?

An Inspector Calls

Show of hands please 🙏



- We have HV Electrical Safety Rules? ✓
- We have HV Authorised Persons? (APs, SAPs?) ✓
- We have LV Electrical Safety Rules? ✓
- We have LV “Authorised Persons” (APs) ? ✓ and/or
We have LV “Competent Persons” (CPs) ? ✓
- Our SAP / AP / CP training is fully up-to-date? ✓
- Our SAP / AP / CP competence is assessed & documented? ✓
- We audit our Electrical Training and Authorisation process regularly? ✓
- We could demonstrate TODAY a strong compliance performance to the HSE Electrical Inspector relating to Estates Electrical Staff training, assessment and authorisation? ✓



An Inspector Calls



Powers?

- Enter your premises
- Examine and investigate
- Stop work
- Take samples, measurements and photographs
- Dismantle and remove articles and substances
- Take possession of articles and substances
- Question you
- Review, take copies of and require the production of, books or documents.

Actions?

- No action
- Verbal advice
- Written advice
- Improvement notice
- Prohibition notice
- Formal caution
- Prosecution

When would An Inspector Call?

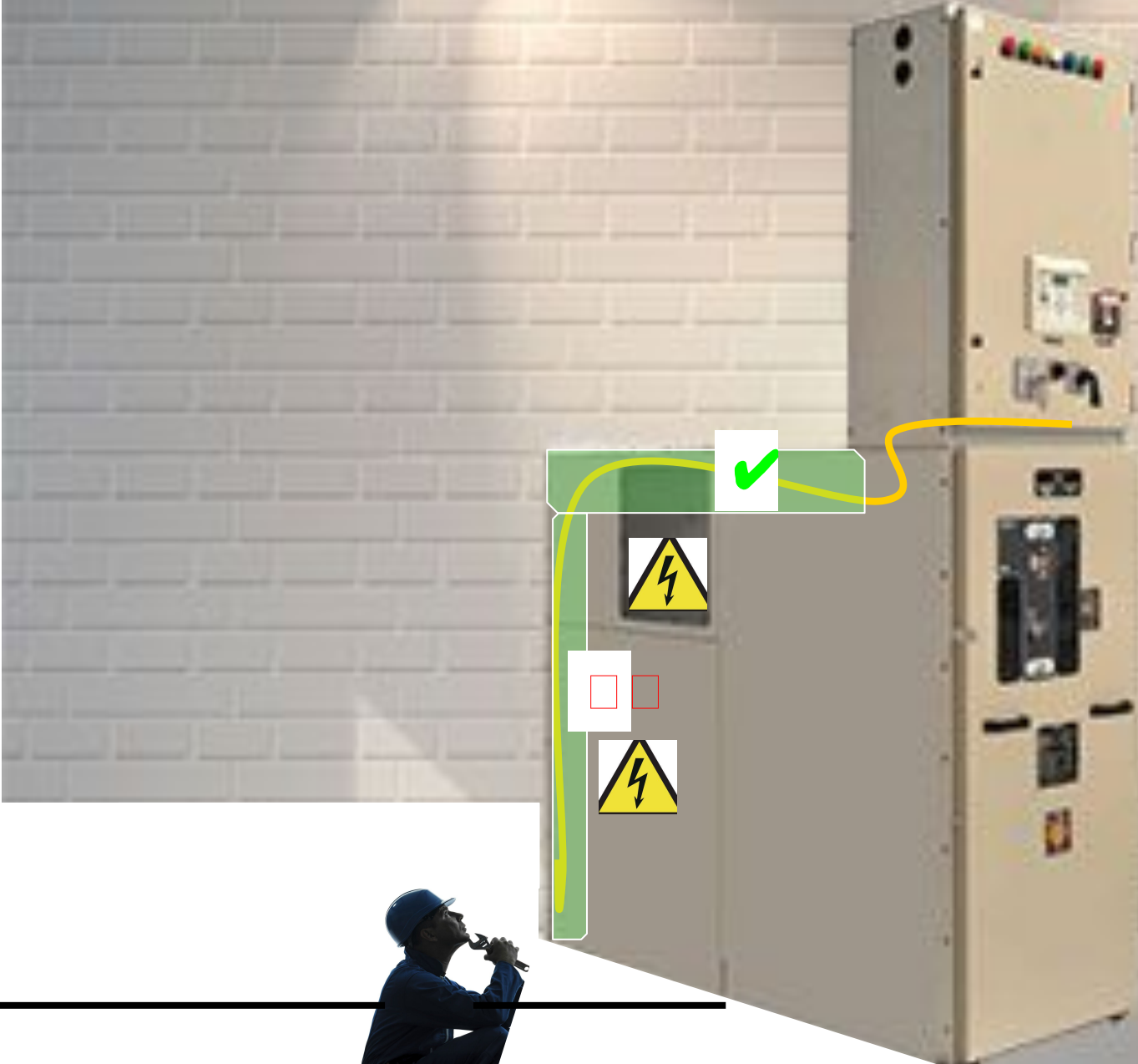


When would An Inspector Call?





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OSTILL

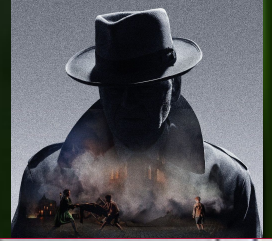


iStock
OSTILL









When would An Inspector Call?



When would An Inspector Call?



PERMIT TO WORK MUST BE DISPLAYED AT SITE OF WORK

ISSUED TO: [REDACTED]	COMPANY: [REDACTED]	TIME: 08 ⁰⁰	DATE: 10
WORK TO BE DONE: RUN CABLES FOR MONITORING TRIPS & DC VOL			
LOCATION: [REDACTED]	BUILDING: ALL	FLOOR: 11.1	
CHECKLIST/CONDITIONS (TICK BOX OR DELETE WHERE APPLICABLE):			
1.	SAFETY GUIDE FOR CONTRACTORS ISSUED.	YES/NO	
2.	HAZARDOUS WORK PERMIT REQUIRED.	YES/NO	
3.	ELECTRICAL HIGH VOLTAGE PERMIT REQUIRED.	YES/NO	
4.	ENCLOSED SPACE PERMIT TO WORK REQUIRED.	YES/NO	
5.	PERSONS AUTHORISING COMMENCEMENT OF WORK (e.g. Area Supervision)	YES/NO	
6.	FIRE/FUME ISOLATION CERTIFICATE REQUIRED	YES/NO	
Sign: _____ ☐		Sign: _____	
Sign: _____ ☐		Sign: _____	
7.	SPECIAL HAZARDS THAT MAY BE ENCOUNTERED (e.g. Chemicals, High Voltages, etc.) NONE		
8.	SPECIFY HAZARDOUS MATERIALS TO BE USED (e.g. Solvents, Adhesives, Cartridge Guns etc.) NONE		
9.	OTHER CONDITIONS: DO NOT TOUCH ANY BUTTONS		
10.	BARRIER OR WARNING NOTICES REQUIRED.	YES/NO	
TIME LIMIT: (MAXIMUM 7 DAYS)		DATE(S): 10 → 14 TH NOV	
FROM: 08 ⁰⁰		TO: 17 ³⁰	
AUTHORISATION (by designated [REDACTED] personnel only): I HAVE EXAMINED THE AREA AND DETERMINED THAT THE WORK MAY BE SAFELY UNDERTAKEN FOLLOW THE AGREED METHODS OF WORKING			

An Inspector Calls!



An Inspector Calls!



The consequences...



- HSE Inspector



- Negligence?



- Written Advice

“... bordering on prosecution...”

- EHS, Compliance, HR, Legal, Global Facilities Leadership, Board of Directors

FMU 08
HM Principal Inspector



When would An Inspector Call?



Health & Safety Executive
Field Operations Directorate Scotland

FMU 08

HM Principal Inspector [REDACTED]

Your Ref:

Our Ref: [REDACTED]

Date: [REDACTED]

f. a .o. [REDACTED]

Dear Sir

HEALTH AND SAFETY AT WORK ETC ACT 1974
HIGH VOLTAGE DANGEROUS OCCURRENCE ELECTRICAL SUB -
STATION [REDACTED]

I refer to the above incident and my investigation of the circumstances with my colleague Mr J Madden.

It is clear that the events leading up to the above situation must be carefully reviewed given the potential for fatal consequences.

I do not intend sending a report to the Procurator Fiscal but would highlight the following points which require action.

(1) Control of Work

It is important that future work of this nature is organised and supervised by personnel who

When would An Inspector Call?



FMU 08
HM Principal Inspector [REDACTED]

Your Ref: [REDACTED]

Our Ref: [REDACTED]

Date: [REDACTED]

1. Control of Work
2. Coordination of Contract Work
3. Training, Assessment & Authorisation Procedures for Electrical Staff

*“...future work must be supervised by personnel who have the **requisite knowledge of the construction and operational aspects of the particular equipment**, in addition to the relevant safety training...”*

When would An Inspector Call?



Health & Safety Executive
Field Operations Directorate Scotland



FMU 08

HM Principal Inspector



Your Ref:

Our Ref:



Date:



1. Control of Work
2. Coordination of Contract Work
3. Training, Assessment & Authorisation Procedures for Electrical Staff

“...future work must be supervised by personnel who have the requisite knowledge of the construction and operational aspects of the particular equipment, in addition to the relevant safety training...”

“... the process of training, competence assessment and authorising electrical staff, should be formally managed and audited regularly, with senior management oversight...”

The consequences...



- Life Changing: Employment Tribunals, Legal, Media / Press



- Improved Training – equipment specific

- Competence Assessment of ADs? On the job every week!

- Eternally Conditioned!



UNIVERSITY of LIFE	
Authorised Person: Practical Exercise: LV Power Factor Correction Panel	
Building and Equipment / circuit: Main Building Outside Main Switchroom Power Factor Correction Panel	
Comments & Observations of the Authorised Person	Practical Exercise: An external contractor's ECP has requested access to the PFC panel to replace >10-year-old capacitors. Prepare and complete the following:- 1. Prepare the appropriate electrical safety document. 2. Complete the required switching / isolation of the apparatus to be worked on. 3. Complete any additional measures required to release the equipment to be worked on. 4. Issue the safety document to the ECP.
Comments & Observations of the Authorising Engineer	



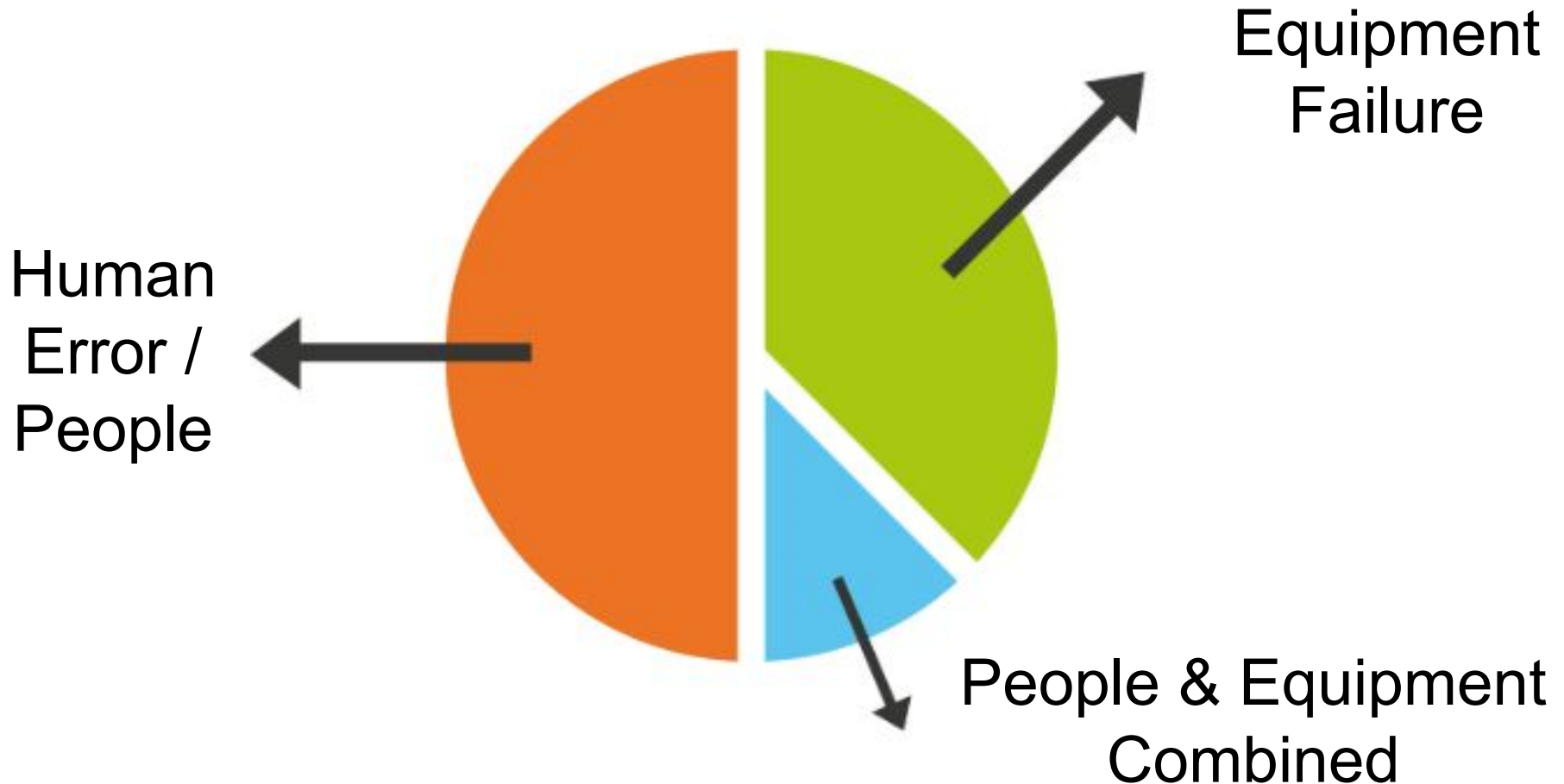
Health & Safety Executive
Field Operations Directorate Scotland

FMU 08
HM Principal Inspector

HSE Electrical Inspector Priority Compliance Requirements?

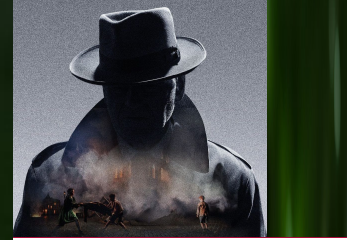


Failure Causes (...requiring an Inspector to Call?...)



HSE Electrical Inspector

6 Priority Compliance Requirements?



People?

1. Suitably Trained

2. Competent & Authorised

3. Safety Rules & Procedures



Your Ref: [REDACTED]
Our Ref: [REDACTED]
Date: [REDACTED]

"...future work must be supervised by personnel who have the requisite knowledge of the construction and operational aspects of the particular equipment, in addition to the relevant safety training..."



Building and Equipment / Circuit:

Main Data Centre
Main Switchroom
Main switchboard "A"

Comments & Observations of the Authorised Person

Authorised Person:

Practical Exercise: Data Centre Incomer ACB Tripping Assessment



Practical Exercise:

The Data Centre Main Switchboard "A" is without Mains and Generator Power.

1. Discuss your initial assessment priorities?
2. Once you have observed the evidence of what has happened, (AE will advise you what this evidence is...), discuss your next steps?
3. Prepare a switching plan to gain access to the equipment suspected of being root cause. (AE will advise / confirm the most likely root cause culprit equipment).



Comments & Observations of the Authorising Engineer



ESTATES and BUILDINGS

DOCUMENT NUMBER

COA_APLV 001

CERTIFICATE OF AUTHORISATION
AUTHORISED PERSON (LV)

DOCUMENT ISSUE

0

PAGE

1 OF 1

AUTHORISED PERSON
POSITION

AUTHORISATION CATEGORIES

1 – 21 inclusive

This certifies that the above named person has demonstrated the required level of knowledge and overall competence and is authorised to carry out work on electrical equipment as specified in the Categories of Duties below.

AUTHORISING ENGINEER'S SIGNATURE

POSITION

DATE OF ISSUE & RECEIPT

AUTHORISED PERSON'S SIGNATURE

EXPIRY DATE



1. Suitably Trained

The image shows a control panel for a laser system. The panel is dark grey with a green control unit on the left, two large black switches in the center, and a control box on the right. Above the panel are three labels: a University of Chicago logo, an 'INCOMING SUPPLY' label, and a 'DANGER 415nm ISOLATE EYEWEAR BEFORE GAINING ACCESS' label. To the left of the panel is a technical diagram of a laser system.



<i>Asset /Action</i>	<i>Photograph</i>
The flow chart below provides guidance on the actions to consider in the event of an unplanned TRIP event on this type of ACB & Protection Unit: <pre> graph TD A([ACB Trip Event]) --> B[Retrieve the Last Trip Data from Protection Unit] B --> C{Was the trip event caused by either "ST" or "INST"?} C -- No --> D{Was the trip event caused by "LT"?} D -- No --> E{Was the trip event caused by "GF"?} </pre>	ST = Short Time Delay INST = INSTantaneous LT = Long Time Delay GF = Ground Fault 7.8 Retrieving Last Trip Data Push the "Display" button to view the last trip data. The following is displayed: Push the "More" button to display the remaining trip data.



PROCEDURE FOR SWITCHING OVER TO EXTERNAL MANUAL BYPASS

Asset / Action

Photograph

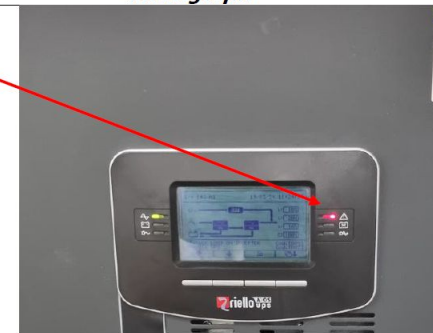
Attention: if the UPS is in battery operation, manual bypass insertion may cut off power to the critical load.

UPS1 Checked?

11

UPS2 Checked?

7



HSE Electrical Inspector

6 Priority Compliance Requirements?



People?

1. Suitably Trained

2. Competent & Authorised

3. Safety Rules & Procedures

legislation.gov.uk/ukxi/1989/635/regulation/16#:~:text=...

1989, Section 16. ?

Persons to be competent to prevent danger and injury

16. No person shall be engaged in any work activity where technical knowledge or experience is necessary to prevent danger or, where appropriate, injury, unless he possesses such knowledge or experience, or is under such degree of supervision as may be appropriate having regard to the nature of the work.

- **designated competent person (also known in some industries as 'authorised person' and 'senior authorised person')**: a competent person appointed by the employer, preferably in writing, to undertake certain specific responsibilities and duties, which may include the issue and/or receipt of safety documents such as permits-to-work. **The person must be competent by way of training, qualifications and/or experience and knowledge of the system to be worked on;**
- **disconnected**: equipment (or a part of an electrical system) that is not connected to any source of electrical energy;
- **equipment**: electrical equipment including anything used, intended to be used or installed for use, to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure or use electrical energy (as defined in the EAW Regulations);

Actions for managers and supervisors

18 Managers should establish a system of rules and procedures wherever electrical work is to be carried out, or ensure that contractors brought in to do electrical work have appropriate rules and procedures. These should be written down and everybody involved must be made aware of them as they will form the basis of task-specific risk assessments. The amount of detail depends on the

HSE Electrical Inspector

6 Priority Compliance Requirements?



Equipment?

1. DESIGN: Suitable (for intended use and conditions)
2. INSTALLATION: (as per the OEM / BS Requirements)
3. MAINTAINED (to avoid DANGER)

HSE Electrical Inspector

6 Priority Compliance Requirements?



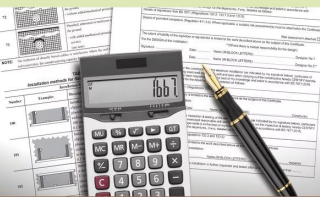
1. DESIGN: Suitable (for intended use and conditions)

IET
The Institution of
Engineering and Technology

Electrical Installation Design Guide

Calculations for Electricians and Designers

5th Edition



Updated to IET Wiring Regulations BS 7671:2018+A2:2022

Apply changes Cancel Print

Supply from: UB [i] Active

Plan prefix: SB2

Description: WEST TOWER NON-ESSENTIAL

Load:

kVA / phase	7.25	6.46	1.96
Diversity	1.00	1.00	1.00
cosp	1	1	1
3rd Harmonics(%)	0	0	0

! Voltage Drop within circuit L1: 14.76 V (6.42%) Neutral current(A): 21.52

! Voltage Drop within circuit L2: 11.9 V (5.17%) Total Load(kVA): 15.7

Voltage Drop within circuit L3: 0 V (0%)

Ib (A): 31.58 ≤ In (A): 32 min Iz (A): 32 ≤ It (A): 12 !

Z1(Ω): 0.3291 Z2(Ω): 0.33

Phase fault:

max Isc (kA): 0.4182 max Isc at starting point (kA): 0.8339

min Isc (kA): 0.1745 Ze (Ω): 0.65

Disconnection time of MCB (sec): 0.01 ≤ Conductors withstand duration (sec): 0.43

Earth Fault:

Ief (kA): 0.2162 Ia(A): 160 Ze (Ω): 0.35

Disconnection Time (sec):

MCB: 0.01 ≤ Maximum: 5 Zs(Ω): 1.0107 ≤ max Zs(Ω): 1.3656

Ph/N Conductor: BS 4D1 Cu Single-core 70°C PVC non-armoured

Type: Filter list: Cu All insulations 3Ph + N Wiring: 3Ph + N Make up of circuit conductors: Pvc70/S/Cu 4x1Cx1mm² + 1x1mm² E Options: Flexible

Installation: Category: In conduit 1.5 15.5A 2.5 21A 4 28A 6 36A 10 50A 16 68A 25 89A 35 110A 50 134A 70 171A 95 207A 120 239A 150 262A 185 296A 240 346A 300 394A 400 467A 500 533A 630 611A

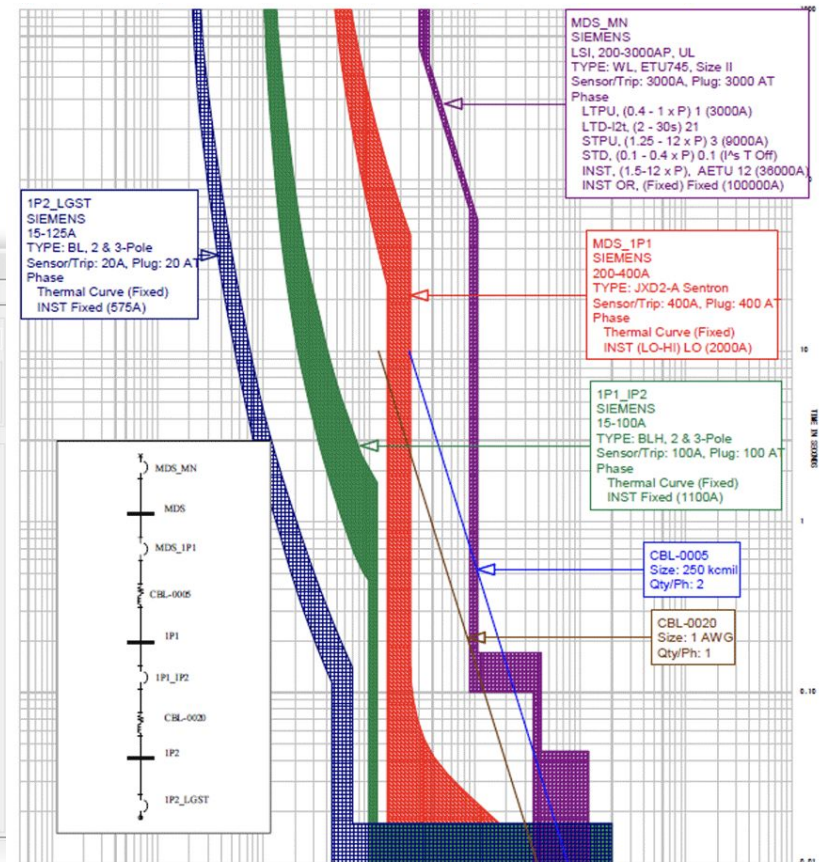
Description of the ins: Cables in conduit in an open or ventilated floor channel

Reference method: B

Conduit: Size: 16 Diameter (mm): 16 Find

Length (m): C.S.A (mm²) / Rating: 1 12A Find

Parallel conductors: Use

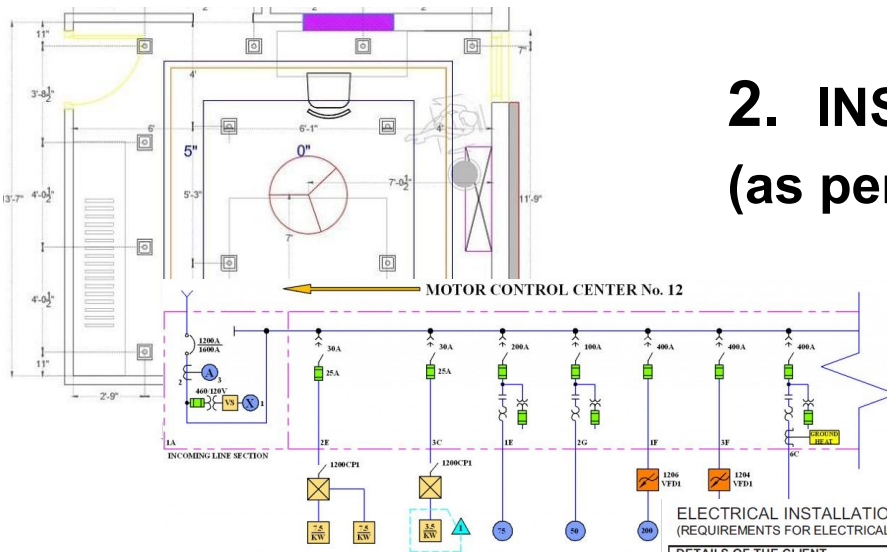


HSE Electrical Inspector

6 Priority Compliance Requirements?



2. INSTALLATION: (as per the OEM / BS Requirements)



DISTRIBUTION BOARD SCHEDULE

ELECTRICAL INSTALLATION CERTIFICATE (REQUIREMENTS FOR ELECTRICAL INSTALLATIONS BS 7671 (IET WIRING REGULATIONS))

DETAILS OF THE CLIENT	
Installation address	
Description and extent of the installation	
Extent of installation covered by this Certificate:	
(Use continuation sheet if necessary) see continuation sheet No:	
FOR DESIGN	
I/We being the person(s) responsible for the design of the electrical installation (as indicated by my/our signatures below), particulars of which are described above, having exercised reasonable skill and care when carrying out the design and additionally where this certificate applies to an addition or alteration, the safety of the existing installation is not impaired, hereby CERTIFY that the design work for which I/we have been responsible is to the best of my/our knowledge and belief in accordance with BS 7671:2018, amended to (date) except for the departures, if any, detailed as follows:	
Details of departures from BS 7671 (Regulations 120.3, 133.1.3 and 133.5):	
Details of permitted exceptions (Regulation 411.3.3). Where applicable, a suitable risk assessment(s) must be attached to this Certificate.	
The extent of liability of the signatory or signatories is limited to the work described above as the subject of this Certificate.	
For the DESIGN of the installation: ** (Where there is mutual responsibility for the design)	
Signature: Date: Name (IN BLOCK LETTERS): Designer No 1	
Signature: Date: Name (IN BLOCK LETTERS): Designer No 2**	
FOR CONSTRUCTION	
I being the person responsible for the construction of the electrical installation (as indicated by my signature below), particulars of	

MINOR ELECTRICAL INSTALLATION WORKS CERTIFICATE

(REQUIREMENTS FOR ELECTRICAL INSTALLATIONS BS 7671 (IET WIRING REGULATIONS))
To be used only for minor electrical work which does not include the provision of a new circuit

PART 1: Description of the minor works	
1. Details of the Client Date minor works completed	
2. Installation location/address	
3. Description of the minor works	
4. Details of departures, if any, from BS 7671:2018 for the circuit altered or extended (Regulation 120.3, 133.1.3 and 133.5): Where applicable, a suitable risk assessment(s) must be attached to the Certificate	
5. Comments on (including any defects observed in) the existing installation (Regulation 644.1.2) Risk assessment attached ☐	
PART 2: Presence and adequacy of installation earthing and bonding arrangements (Regulation 132.16)	
1. System earthing arrangement: TN S ☐ TN C S ☐ TT ☐	
2. Earth fault loop impedance at distribution board (Z_{s1}) supplying the final circuit Ω	
3. Presence of adequate main protective conductors: Earthing conductor: ☐ Main protective bonding conductor(s) to: Water ☐ Gas ☐ Oil ☐ Structural steel ☐ Other ☐	
PART 3: Circuit details	
DB Reference No.: DB Location and type:	
Circuit No.: Circuit description:	
Circuit overcurrent protective device: BS(EN) Type Rating A	
Conductor sizes: Live mm ² cpc mm ²	
PART 4: Test results for the circuit altered or extended (where relevant and practicable)	
Protective conductor continuity: $R_L + R_p$ Ω or R_p Ω	
Continuity of ring final circuit conductors: L/L Ω N/N Ω cpc/cpc Ω	
Insulation resistance: Live/Live M Ω Live/Earth M Ω	
Polarity satisfactory: ☐ Maximum measured earth fault loop impedance: Z_s Ω	
RCD operation: Rated residual operating current ($I_{\Delta n}$) mA	
Disconnection time ms	
Satisfactory test button operation ☐	
PART 5: Declaration	
I certify that the work covered by this certificate does not impair the safety of the existing installation and the work has been designed, constructed, inspected and tested in accordance with BS 7671:2018 (IET Wiring Regulations) amended to (date) and that to the best of my knowledge and belief, at the time of my inspection, complied with BS 7671 except as detailed in Part 1 above.	
Name: Signature:	
For and on behalf of: Position:	

HSE Electrical Inspector

6 Priority Compliance Requirements?



Equipment?

1. DESIGN: Suitable (for intended use and conditions)
2. INSTALLATION: (as per the OEM / BS Requirements)
3. MAINTAINED (to avoid DANGER)



HSE Electrical Inspector

6 Priority Compliance Requirements?



ELECTRICAL INSTALLATION CONDITION REPORT

SECTION A. DETAILS OF THE PERSON ORDERING THE REPORT

Name
Address

SECTION B. REASON FOR PRODUCING THIS REPORT

Date(s) on which inspection and testing was carried out

SECTION C. DETAILS OF THE INSTALLATION WHICH IS THE SUBJECT OF THIS REPORT

Occupier
Address

Description of premises

Domestic ☐ Commercial ☐ Industrial ☐ Other (include brief description) ☐

Estimated age of wiring system years

Evidence of additions / alterations Yes ☐ No ☐ Not apparent ☐ If yes, estimate age years

Installation records available? (Regulation 651.1) Yes ☐ No ☐ Date of last inspection (date)

SECTION D. EXTENT AND LIMITATIONS OF INSPECTION AND TESTING

Extent of the electrical installation covered by this report

Agreed limitations including the reasons (see Regulation 653.2)

Agreed with:

Operational limitations including the reasons (see page no.....)

The inspection and testing detailed in this report and accompanying schedules have been carried out in accordance with BS 7671:2018 (IET Wiring Regulations) as amended to

It should be noted that cables concealed within trunking and conduits, under floors, in roof spaces, and generally within the fabric of the building or underground, have not been inspected unless specifically agreed between the client and inspector prior to the inspection. An inspection should be made within an accessible roof space housing other electrical equipment.

SECTION E. SUMMARY OF THE CONDITION OF THE INSTALLATION

General condition of the installation (in terms of electrical safety)

Overall assessment of the installation in terms of its suitability for continued use
SATISFACTORY / UNSATISFACTORY* (Delete as appropriate)

*An unsatisfactory assessment indicates that dangerous (code C1) and/or potentially dangerous (code C2) conditions have been identified.

SECTION F. RECOMMENDATIONS

! WARNING

E.T.N. **SHOCK & ARC FLASH HAZARD**
Warning Equipment Manufacturer
 Location: MAIN SWGR
 Report #: TQS12345.1 Rev. 0 G Issued: JULY-2018

A	13' 6" B ARC FLASH BOUNDARY
	32 cal/cm ² CALCULATED INCIDENT ENERGY AT 36" WORKING DISTANCE C
D	3' 10" ARC FLASH BOUNDARY
	6 cal/cm ² CALCULATED INCIDENT ENERGY AT 36" WORKING DISTANCE E
F	480 V Shock Hazard Limited Approach Boundary: 3' - 6"
	Min. Glove Class: 00 Restricted Approach Boundary: 1' - 0"

3. MAINTAINED (to avoid DANGER)

HSE Electrical Inspector

6 Priority Compliance Requirements?



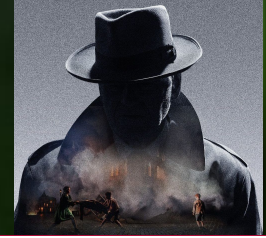
People?

1. Suitably Trained ✓
2. Competent & Authorised ✓
3. Safety Rules & Procedures ✓

Equipment?

1. Design ✓
2. Installation ✓
3. Maintained ✓

An Inspector Calls



Summary

1. Why might an Inspector call?
And what to expect! 😬



2. Comply with the 6 HSE priority compliance reqs....

And you're very well positioned if An Inspector Calls 👍

People?	Equipment?
1. Suitably Trained ✓	1. Design ✓
2. Competent & Authorised ✓	2. Installation ✓
3. Safety Rules & Procedures ✓	3. Maintained ✓

An Inspector Calls



Questions? 



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