Unit 4: Equipment Description

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Objective

Describe the Typical Electric Utility Ancillary Equipment, their Primary Function, and their Potential Faulting and Failures.
Unit 4: Equipment Description

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Universal Fuse
Non-Exempt

Pull Ring
Expulsion end of fuse
Unit 4: Equipment Description

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Universal Fuse
Non-Exempt

Arm Mounted Cutout with Universal Fuse

Slide 6

Open Link Fuse
Non-Exempt

Arm Mounted Cutout with Open Link Fuse

Slide 7

Open Link Fuse
Non-Exempt

Bushing Mounted Cutout with Open Link Fuses
Unit 4: Equipment Description

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Enclosed Cutouts with Universal Fuse

Non-Exempt

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Solid Blade Disconnect

Non-Exempt

Solid Blade Disconnect - Closed

Solid Blade Disconnect - Open

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Solid Blade Disconnect

Non-Exempt

4 kV Bayonet
Unit 4: Equipment Description

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**Combination**
Non-Exempt and Exempt Hardware

- Solid Blade Disconnect in Open Position – Non-Exempt
- Arm Mounted Cutout with Non-Expulsion Fuse - Exempt

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**In-Line Disconnect**
Non-Exempt
Unit 4: Equipment Description

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In-Line Disconnect
Non-Exempt

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Lightning Arrestors
Non-Exempt

Arm Mounted Lightning Arrestors with Cable Riser and Universal Fuses

Lightning Arrestors with Recloser

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Lightning Arrestors
Non-Exempt
Unit 4: Equipment Description

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Non-Porcelain Lightning Arrestors
Non-Exempt

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Lightning Arrestors
Non-Exempt
Gapped Lightning Arrestor

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Lightning Arrestors
Non-Exempt
Unit 4: Equipment Description

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Hot Tap Clamps
Non-Exempt

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Split Bolt Connectors
Non-Exempt
Unit 4: Equipment Description

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*Miscellaneous Connectors*

*Non-Exempt*

Fargo Connectors

LM Connector

---

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*Grasshopper Air Switch*

*Non-Exempt*

Closed

Open
Unit 4: Equipment Description

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Transmission Air Switch
Non-Exempt

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Transmission Air Switch
Non-Exempt
Unit 4: Equipment Description

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Non-Expulsion Fuses
Exempt

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Non-Expulsion Fuses
Exempt

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Liquid Filled Fuses
Exempt
Unit 4: Equipment Description

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Liquid Filled Fuses
Exempt

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SMU-20 Fuses
Exempt

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SMU-20 Fuses
Exempt

Lightning Arrestors
Non-Exempt
Unit 4: Equipment Description

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S&C Fault Tamer Fuses

Exempt

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600 Amp KPF Air Switch

Exempt

Triangular Construction – Open and Closed Positions

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600 Amp KPF Air Switch

Exempt

Crossarm Construction – Closed Position
Unit 4: Equipment Description

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Underarm Sidebreak Switch

Exempt

Open Position

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Underarm Sidebreak Switch

Exempt

Closed Position

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S&C Underarm Side-break Switch

Exempt

Closed Position
Unit 4: Equipment Description

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S&C Omni-Ruptor Switch

- Exempt
- Open Position
- Closed Position

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S&C Scada-Mate Switch

- Exempt
- Open Position - Green
- Closed Position - Red

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Recloser

- Exempt
- Solid Blade Disconnects
- In-Line Disconnects
Unit 4: Equipment Description

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Sectionalizer
Exempt

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Voltage Regulators
Exempt

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Capacitor Bank
Exempt
Unit 4: Equipment Description

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Transformers
Exempt

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Parallel Groove Connectors
Exempt

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Hot Tap Clamps
Exempt
Unit 4: Equipment Description

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Piercing Hot Tap Clamp
Exempt

Piercing Clamp on Tree Wire

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Wedge Connectors
Exempt

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Compression & Bolted Flat Plate Connectors
Exempt
Unit 4: Equipment Description

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Splices
Exempt

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Animal Protection Devices

Insulated Conductor Covering
Birds – Squirrels – Cats

Raptor Perch – Birds
Unit 4: Equipment Description

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Animal Protection Devices

- Anti-Perch Guard
- Anti-Perch Owl

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Animal Protection Devices

- Squirrels Guards

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Circuit Protection Devices

- Vibration Dampers
- Vibration Dampers
- Line Opener
- Long Span Conductor Spreader
Unit 4: Equipment Description

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Insulators

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Knowledge Check

Which of the following pieces of electrical ancillary equipment is classified as “Non-Exempt”:
A. Piercing Hot Tap Clamp
B. Universal Fuse
C. SMU-20 Fuse
D. Transformer

Which of the following pieces of electrical ancillary equipment is classified as “Non-Exempt”:
A. Piercing Hot Tap Clamp
B. Universal Fuse
C. SMU-20 Fuse
D. Transformer
Unit 4: Equipment Description

Knowledge Check

Which item of electrical ancillary equipment is always classified as “Non-Exempt:
A. Hot Tap Clamps
B. Split Bolt Connectors
C. Solid Blade Disconnects
D. Grasshopper Air Switches

Knowledge Check

“Exempt” hardware can be an ignition source for Wildfires:
True
False

TRANSITION to Unit 5: Scene Security.