

Incident Summary #II-1647394-2023 (#42298) (FINAL)

SUPPORTING INFORMATION	Incident Date	December 9, 2023	
	Location	Mission	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 1000V)	
	Impact	Qty injuries	0
		Injury description	N/A
	Damage	Injury rating	None
		Damage description	Fire damage to the exterior wall and the attic space in an existing single-family dwelling. Fire damage to the consumer service conductors and conduit for the service between the meter enclosure and the connection to the electrical supply authority.
		Damage rating	Moderate
	Incident rating	Moderate	
Incident overview	The conduit containing the service conductors may have been tampered with causing damage to the service conductors. When the insulation on the service conductors failed, arcing occurred, which melted the service conduit. Molten metal dripped from the service conduit into the attic and igniting the wood.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The 100 amp, 120/240-volt consumer service line conductors installed in electrical metal tubing (EMT) carry current (amps) from the supply authority to the meter enclosure. The supply authority meter reads the amount of wattage (amps X voltage) consumed by the single-family dwelling for billing purposes.</p> <p>The service conductors are upstream of the main service box overcurrent device, and therefore, are not protected by it. Any damage or overload and contact with grounded service conduit or other objects can cause the conductors to overheat and start insulation or adjacent combustibles on fire.</p>	
	Failure scenario(s)	The electrical metal tubing (EMT) housing the consumer service conductors from the meter enclosure to the connection point of the supply authority appears to have been previously tampered and possibly separated for the purpose of bypassing the electrical supply authority's metering. The conductors may have been previously tampered with, which likely caused a failure, over time, in the insulation. The failed insulation on the service conductors melted allowing contact between the bare copper conductors and the EMT resulting in a short circuit between the other service conductors. With no overcurrent protection, the EMT melted causing molten metal to fall onto the wood framing in the attic space, igniting the wood.	

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Facts and evidence	<p>Homeowner Statement:</p> <ul style="list-style-type: none">• Daughter noticed lights flickering before the fire. <p>Fire Fighter Statement:</p> <ul style="list-style-type: none">• Wires melted in the attic (Image 5).• Conduit came apart in his hands (Image 7).• There was evidence of arcing on the service conductors at the point where the conduit separated. <p>Electrician Statement:</p> <ul style="list-style-type: none">• The circuitry had been altered.• There was no damage in the panel. <p>Safety Officer observations:</p> <ul style="list-style-type: none">• The service conduit shows signs of been tampered with.• Appears the service conduit coupling was removed where the short circuit originated.• No evidence of a coupling to join the service conduit together in the attic (Image 6).• Service conductors melted together at the point of suspected tampering (Image 8).• Evidence of molten drips (Image 4).• There is no other ignition source in the portion of the attic where the fire started.
Causes and contributing factors	<p>The consumer service conductor's insulation was possibly tampered with. Over time, the insulation may have failed, causing a short circuit between the conductors and the metallic service raceway. The failure of the insulation combined with lack of overcurrent protection on the consumer service conductors may have caused the electrical metal tubing EMT to melt and possibly drip molten metal into the attic space below the EMT. The fire was located directly below where the EMT shows signs if dripping.</p>



Image 1 - Fire in the attic and on exterior of the single-family dwelling.



Image 2 - Fire started by molten drips. This is thought to be the area of origin.



Image 3 - Bare conductors in the service conduit. The service conductor arced through the metallic service conduit in the attic.



Image 4 - Bare conductors in the service conduit. The service conductor arced through the metallic service conduit in the attic. [Circle] Molten drip.



Image 5 - The service conductors with their insulation burned off and arcing at the ends of the conductors.



Image 6 – No evidence of a service conduit coupling.



Image 7 - No evidence of a coupling, possible tampering.



Image 8 - Insulation failed, bare consumer service conductors.