Incident Summary #II-1314532-2022 (#25810) (FINAL)

SUPPORTING INFORMATION	Incident Date		January 15, 2022
	Location		Crescent Valley, BC
	Regulated industry sector		Electrical - Low voltage electrical system (30V to 750V)
	Impact – Injury	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Impact – Damage	Damage description	Single family dwelling sustained extensive fire, heat, smoke, and fire suppression damage – potentially a total loss
		Damage rating	Major
	Incident rating		Major
	Incident overview		Overhead electrical services metallic mast pipe was bent by snow sliding down the structure metal roofing. The mast pipe interior area was compromised where mast pipe was bent. The interior surface of the mast pipe was creased by the bend and the crease edge penetrated the copper service conductor insulation and contacted the copper conductor, creating a short circuit to electrically bonded-to-ground mast pipe resulting in a localized electrical arc blast which ignited adjacent combustible material.
INVESTIGATION CONCLUSIONS	Site, system and components		Aerial electrical service conductor is attached to a 63mm metallic service mast pipe projecting vertically above the structure roofline approximately 1m. The mast pipe is fixed to the structure with mast pipe supports secured into acceptable structure backing material. The mast pipe is sized to accept the cantilever load impressed by the aerial conductors. The metallic mast pipe and associated metallic service equipment is electrically bonded to ground by the electrical service equipment system bonding jumper. The electrical service conductors supplying the service equipment to the structure are energized at 240 volts between the ungrounded service conductors and 120 volts between the ungrounded service conductors and ground.
	Failure scenario(s)		The geographical area was impacted by a snowfall weather event that resulted in a snow accumulation of approximately 700mm within a 24-hour period followed by a lengthy weather warming trend and subsequent days of precipitation which resulted in excessive snow loading and snow weight on surfaces throughout the area. The roof system of the structure involved in the incident was sheathed with metallic roofing and pitched to permit moisture and snow to slide off the sheathing. The area of the roofline directly above the mast pipe projection was fitted with a ‘snow break’ to deflect snow sliding down the sheathing. The roofline from the mast pipe projection to the peak of the roof is approximately 4.5m. The weather warming trend and precipitation permitted a large area of snow to slide down the roof sheathing. The mast pipe ‘snow break’ was not able to deflect the large volume of snow resulting in the mast pipe bending to approximately 60 degrees from vertical.

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Facts and evidence	The interior of the mast pipe volume was compromised where the mast pipe was bent. The mast pipe interior surfaces penetrated the service conductor insulation, created short circuit between ungrounded service conductors and a short circuit to ground resulting in an electrical arcing event and molten metallic mast pipe material igniting the combustible wood roof system which escalated and resulted in a structure fire. The geographic area experienced multiple slow sliding events, service repairs and related incidents during the end of January, beginning of February 2022.
Causes and contributing factors	It is highly likely the extreme localized weather events, excessive accumulations of snow, weather warming events and local precipitation resulted in the incident when weighted snow slid down a roof sheathed with metallic roofing. The mast pipe 'snow break' was not able to deflect the amount of snow sliding down the rood sheathing and contributed to the incident.

Photo 1: West side of structure revealing roof structure fire damage and bend electrical service mast pipe

Photo 2: Mast pipe bend area. Hole created by electrical arcing event which would result in molten metal projecting from bend area and igniting adjacent combustible materials.

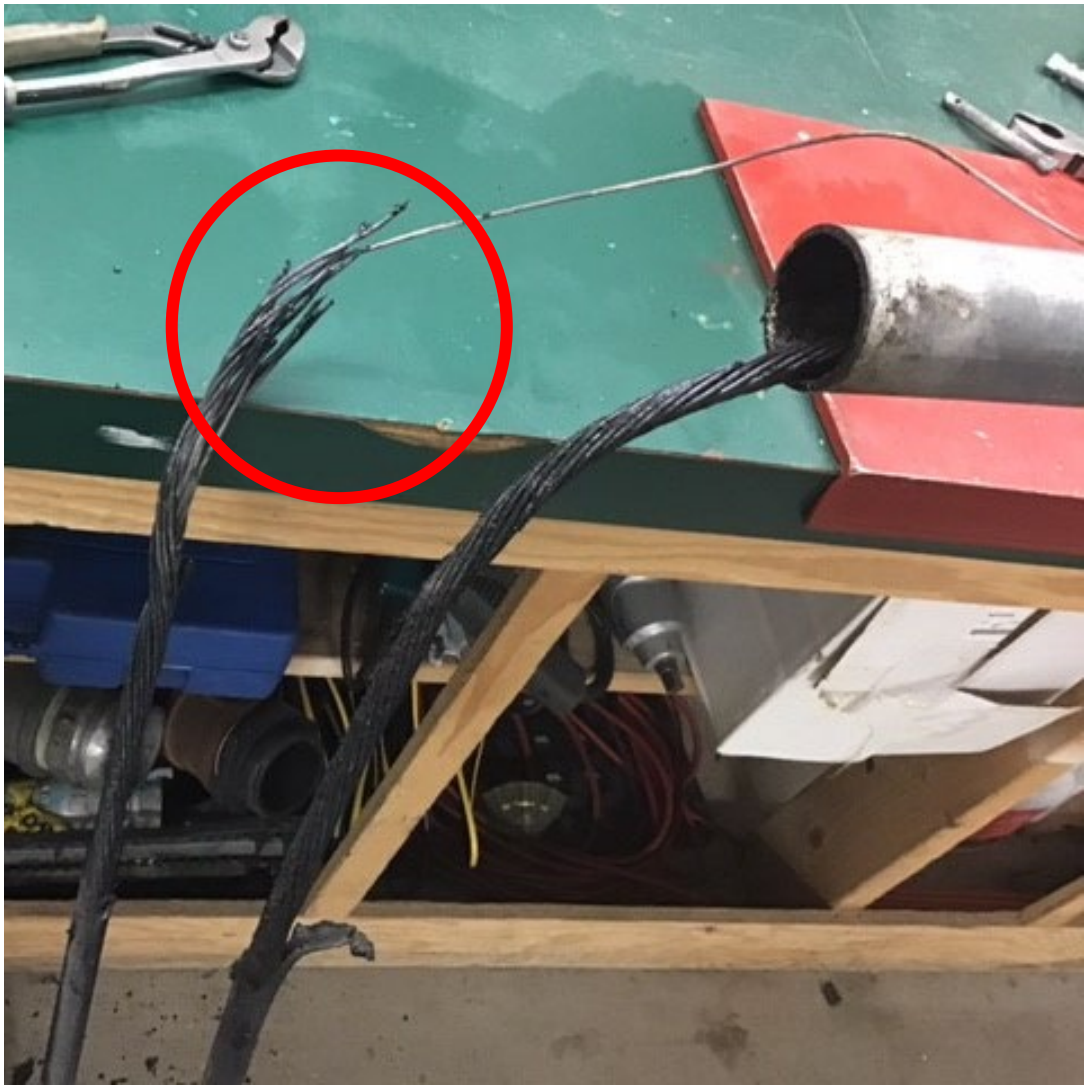

Photo 3: Ungrounded service conductor #1 electrical fault area when withdrawn from mast pipe

Photo 4: Ungrounded service conductor #2 area of electrical fault when withdrawn from mast pipe

Photo 5: Service conductor withdrawn from mast pipe