Incident Summary #II-1347693-2022 (#26712) (FINAL)

SUPPORTING INFORMATION	Incident Date		March 20, 2022
	Location		Burnaby
	Regulated industry sector		Gas - Natural gas system
	Impact – Injury	Qty injuries	0
		Injury description	None
		Injury rating	None
	Impact – Damage	Damage description	Under-fired aluminum melting crucible, damaged. Burner and controls destroyed. Fire extinguishing foam damage to adjoining melting crucible and equipment. Minor structural damage and major smoke damage.
		Damage rating	Moderate
	Incident rating		Moderate
	Incident overview		A crucible used for melting aluminum was suspected of overheating, causing the aluminum in the crucible to ignite creating smoke, heat, and small fire damage. The facility's alarm system detected the fire, and the fire department was notified. The fire department attended and used an extinguishing foam product to put out the fire.
INVESTIGATION CONCLUSIONS	Site, system and components		The facility has two crucibles to melt aluminum to produce aluminum anodes. Each crucible is heated by a natural gas burner which heats the lower section of the crucible. Each burner is controlled by a temperature controller which uses a temperature sensing probe to sense the melted aluminum's temperature and increase or reduce the Btu input of the burner. The temperature controller's temperature sensing probe sits in the molten aluminum. The burner is left to operate continuously to ensure that the aluminum in the crucible remains in a liquid state.
	Failure scenario(s)		The burner heating the crucible is controlled by a supervisory temperature controller and temperature probe. It is believed that the temperature controller failed to control the burner temperature which overheated the aluminum causing it to ignite.
	Facts and evidence		The crucibles, burners, controls, and exhaust system had been in use for several decades and had not been updated. The facility was unoccupied when the fire occurred. The building security alarm detected the fire, and the fire department was notified. The fire department responded and used a fire extinguishing foam product to quench the aluminum and put out the fire. The burner and controls were damaged by the heat from the fire as well as from the extinguishing foam. A site made plywood cover to protect the burner from aluminum splash was burned and there was major smoke damage to the wood ceiling and wall. The old, overhead exhaust ducting was damaged from the heat and from being hit with the extinguishing foam. A FortisBC technician attended the site and shut off the gas supply at the meter location.

Causes and contributing factors	It is probable that the continual cycling of the temperature controller and the reliance on the single temperature probe contributed to the overheating of the aluminum and resultant fire.