House Explosion

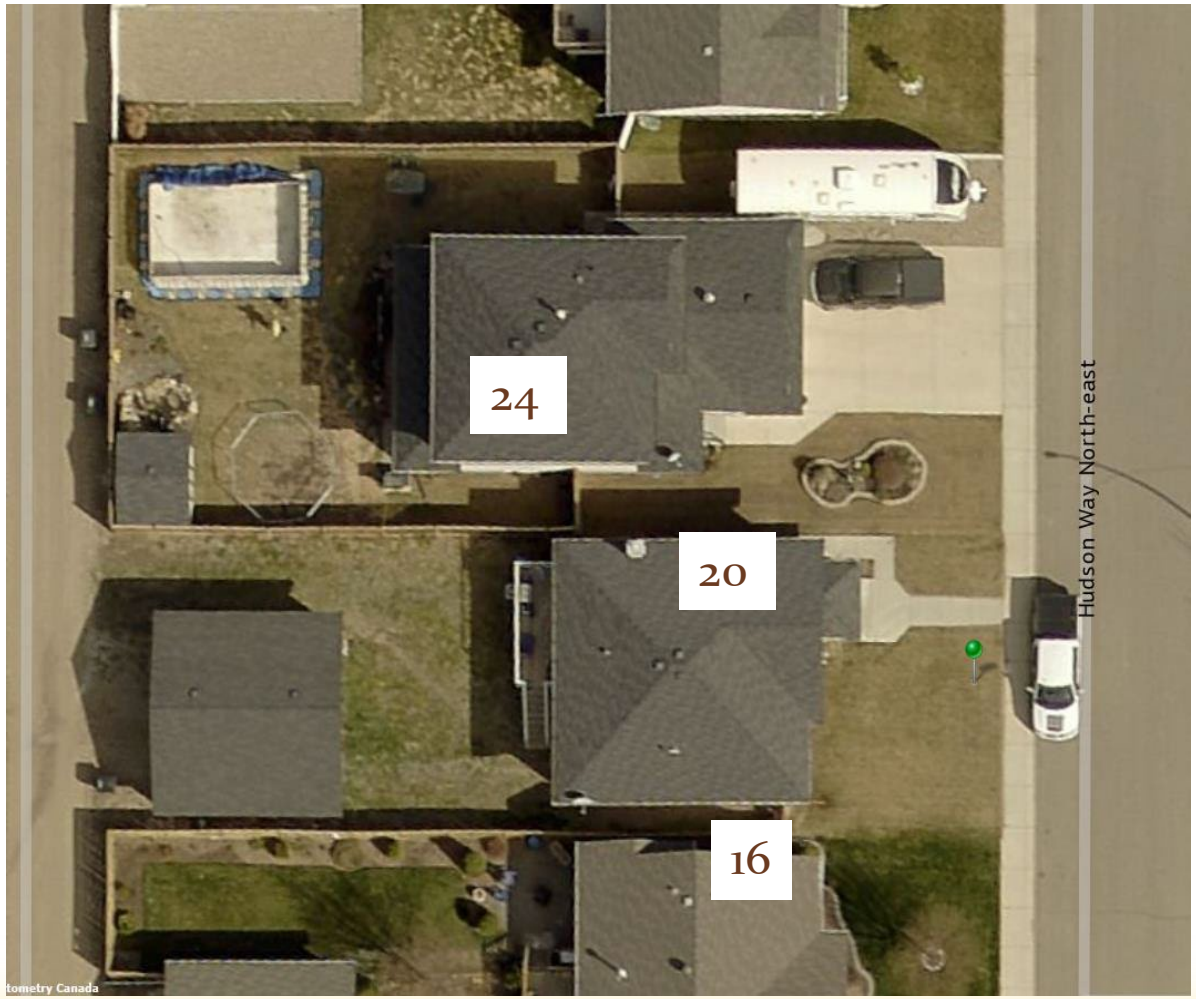
CASE STUDY

FIRE MARSHAL / CHIEF INVESTIGATOR SCOTT HANELT

House Explosion Medicine Hat, Alberta

- Medicine Hat Fire Service responded for a report of an explosion and fire to 20 Hudson Way NE.
- Upon arrival fire crews found a fully involved fire threatening the two structures on either side.
- Firefighters were unable to make entry in 20 Hudson way due full involvement and structural instability.
- Primary searches were conducted the two structures, one either side with no occupant's home at time of event.
- Police report one person who lives in house #20 is unaccounted for.

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- Upon arrival and through a 360, it was noted that the structure had been exposed to an over pressure wave caused by an explosive event.
- Evidence gathered through the 360 of the structure in question was that of a pushing effect that was consistent with a deflagration explosion.
- Structure in question is a is a 1120 square foot Bi-level home with 2x6 wood framed construction with vinyl siding finishing.
- Structures roof is 3/8 OSB sheets covered by asphalt shingles.

What is a Deflagration

- Deflagrations are slower reactions to pressure rise
- Are Subsonic, velocity (energy front) of the reaction is less than the speed of sound
- Produces more of a pushing effect rather than that of a shattering effect seen with Detonations
- Generally, are fueled by diffused gases or dust suspended in air under normal pressure


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- A building SCO was requested to attend due to structural integrity of the structures. Access was denied to all three structures by the Building SCO.
- After some discussion (heated on my part) access to the two adjacent buildings was granted and access to the structure in question would be granted upon rendering it safe.
- Art's excavating brought a large backhoe in to render the structure safe so investigation could continue. Portions of the remaining roof, walls, metal I-beam and large debris were removed from the structure and out from the basement.


DEERE
ART'S EXCAVATING
210G
LC
ART'S
EXCAVATING
Brandt


ART'S
EXCAVATING
DEERE
vivint
CAUTION DO NOT ENTER




DEERE



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- Investigation was started into origin and cause.
- As you can imagine there was a lot of fire debris, building material and water to content with.
- All four investigators were used for this investigation for many reasons:
  - one for the heavy work load
  - two because I wanted trained investigators going through the debris
  - Mentoring of my young investigators
  - And remember we are still looking for origin and cause



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- During or investigation, the remains of a human body was discovered in the debris at 19:50 hours.
- At that time, I released everyone including fire fighters from the scene.
- I kept all my investigators on scene.
- I-dent on scene radio in that a body was discovered, and the Staff Sargent on duty was there shortly after.
- Only myself and another investigator worked around the body, as I wanted to protect the scene as much as possible.
- We cleaned around the body, including removing falling debris that covered the body.

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- Fire debris was cleaned away from the body and surrounding
- Tarps were set up to try a shield our work now from bystanders, media, and whoever else might be watching.
- Photographs were again taken by I-dent and us
- Police Medical Examiner's office to report
- Funeral home came to transport body
- Fire investigators removed body from basement to funeral home vehicle

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- Investigation into the origin and cause continued
- Examination on gas lines on furnace and water heaters
- A short time later evidence of tampering to the furnace and hot water tanks was noted











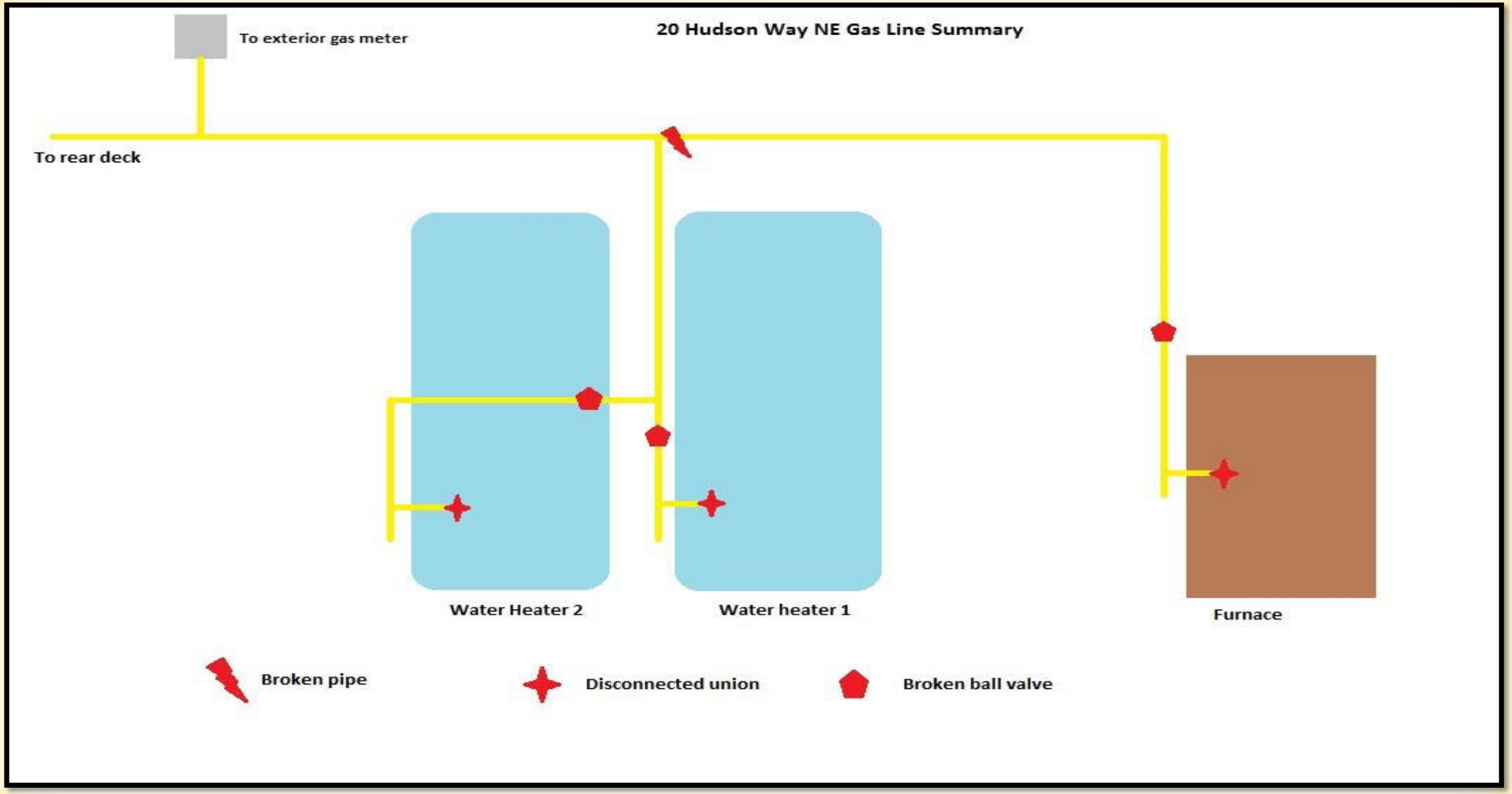


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- I requested gas department re-attend fire scene (they were here earlier to shut down gas to the three structures)
- The gas department removed the gas meter from house #20, evaluated the usage data and printed a report which showed the hourly quantity of gas that flowed through the meter.
- The fire was first reported at 9:56am, between 9:00-10:00 am, 500 CCF (common cubic feet) of gas flowed through the meter.
- From 10:00am until the gas was turned off sometime before 11:00, another 400 CCF flowed through the meter.
- In the previous 7-day period only 300 CCF was used by this dwelling.

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- Investigation continued the following morning
- Debris was completely removed from around the furnace and water heaters to thoroughly examine and photograph in more detail
- Closer examination of natural gas lines near the furnace confirmed that the union was disconnected on the natural gas line that fed the furnace, the natural gas lines had also been disconnected on 2 water heaters located adjacent to the furnace. The pipe fittings were not damaged on these unions which suggest that they were uncoupled prior to the explosion and subsequent fire.


20 Hudson Way NE Gas Line Summary
To exterior gas meter
To rear deck
Water Heater 2
Water heater 1
Furnace
Broken pipe
Disconnected union
Broken ball valve


Furnace





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- The access panel for the furnace burner area was lying flat on the floor in front of the furnace; the lower access panel covering the fan area was still in place.
- There was a pair of plumbing pliers located in the debris on top of the furnace.
- There were 2 small red fuel cans located in the debris near the furnace area, the tops had been completely burned but the bottoms remained intact against the concrete floor.





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- The fire victim was a qualified gas fitter and worked in that field
- He would have been aware of the hazards presented by natural gas and would have taken precautions to ensure the gas was turned off before performing any repairs to these appliances
- He would have also been familiar with the mercaptin odorant that is added to natural gas, and hence would have known that there was a natural gas leak in the house.

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- Conclusion
  - An explosion and subsequent fire occurred as evidence presented in the case study substantiate those findings
  - Evidence shown proves that there was a deflagrative explosion due to fuel gas migration
  - Occupant who by trade is licensed gas fitter and works for a licensed company in the business of performing ventilation and plumbing
  - Occupant is known to Police and has history with drugs and affiliations with organized crime
  - the debris blown (pushed) away from the home and the witness accounts of hearing a loud boom confirm that there was a an explosive event.

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- Police believe at the time; they had reasons to suspect that this explosion and subsequent fire was a cover up to another crime
- I did not agree with them as I felt that the evidence did not support that
- I was asked to attend the Medical Examiners office in Calgary with Police
- During the medical examiners' examination, the ME brought me in and asked what I thought

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- I explained to the ME that I thought this was nothing more than a successful suicide attempt
- I explain that I don't believe he got the desired effects from the explosion, and he died from thermal effects
- ME report came back, and the ME agrees with my findings, citing that the evidence from the autopsy showed that the occupant was indeed alive during the fire and showed no signs a traumatic injury


Questions