

Operating Guideline # 1807

Essential and Advanced Level Fire Investigations

September 19, 2019



PURPOSE:

The purpose of this Operating Guideline (OG) is to ensure a consistent approach to conducting fire origin and cause investigations and to describe the basic approach and documentation considerations for Essential Level Fire Investigation.

ISSUE/RATIONALE:

All fire departments have an obligation to attempt to determine the cause any fire that they attend. Simple fire cause determination efforts can be easily accomplished by most incident commanders, while more complex efforts often require the response of personnel more thoroughly trained or experienced in investigative techniques.

Section 14 of the *Fire Protection and Prevention Act* (FPPA) also authorizes fire departments to conduct examinations (investigations) where a fire has occurred, and the Fire Chief has authorized all duly appointed officers (Deputy Chief(s), Platoon Chief(s), Captains, Lieutenants and any uniformed member of the Fire Prevention Division) to conduct these examinations pursuant to section 6.6 of the FPPA.

The National Fire Protection Association (NFPA) standard 921 (Guide for Fire and Explosion Investigations) is a widely recognized document which sets out fire investigation procedures. This document suggests that a systematic methodology be utilized to conduct a fire investigation. This approach includes the following steps:

1. Recognize the need. (The origin is unknown)
2. Define the problem. (Define the origin)
3. Collect Data. (Basic site data)
4. Analyze the data. (Inductive reasoning)
5. Develop a hypothesis (Does the origin explain the data)
6. Test the hypothesis (Deductive reasoning)

Individuals assigned to conduct “Essential Level Fire Investigations should follow this process including the use of deductive reasoning process in his or her attempt to determine the cause of fires attended.

GUIDELINE:

General

1. It is the policy and practice of the Gravenhurst Fire Department to attempt to determine the origin and cause of all fires that occur in the municipality.
2. For the purposes of determining the origin and cause of fires, fire investigations shall be categorised as a) “Operational Level Fire Investigations”, b) “Essential Level Fire Investigations” or c) “Enhanced Level Fire Investigations”.
3. An “Operational Fire Investigation” is one that is conducted in accordance with OG 810 by the Incident Commander, while Essential or Enhanced Level fire investigations are conducted by staff (or outside agencies) with specialised training (i.e. – the Fire Prevention Officer, OFMEM Fire Investigators).

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4. An “Essential Level Fire Investigation” is conducted by GFD staff members with the necessary knowledge, skills and abilities to conduct more complex investigations. Staff conducting fire investigations should always operate under the authority of the Incident Commander and the appropriate command structure when working at an “active fire scene”.

5. An “Enhanced Level Fire Investigation” shall only be conducted by the Office of the Fire Marshal and Emergency Management (OFMEM). The OFMEM conducts fire cause determination efforts in certain circumstances and must be notified in the following instances:

- a) All fatal fires or critical injury incidents
- b) Explosions
- c) Suspected incendiary fires
- d) Large loss fires - \$500,000 and over
- e) Fires of unusual origin or circumstance - unusual fire/smoke spread, or involves circumstances that may result in widespread public concern, e.g., environmental hazard
- f) Multi-unit residential occupancies - where fire spread is beyond unit of origin
- g) ANY fire at a facility housing vulnerable occupants

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6. When assigned to conduct an “Essential Level Fire Investigation”, staff members should follow the principles as outlined in NFPA 921 (latest edition) where this is practical.

7. Staff members assigned to conduct an “Essential Level Fire Investigation” should have the necessary knowledge, skills and abilities to conduct fire investigations. In all cases, staff members shall undertake a site specific risk assessment in order to determine the level of Personal Protective Equipment (PPE) that may be required and assess site conditions. In addition, staff members assigned shall assess the risks associated with the site including the following:

- a) the necessity of working at heights or in proximity to elevator shafts or similar fall hazards,
- b) The presence of confined spaces (dust collectors, hoppers, bins etc.)
- c) the presence of electrical hazards (see also sentence 12),
- d) the presence of hazardous substances or materials,
- e) the presence of materials or objects under great pressure,
- f) The potential for violence.

8. Staff entering a fire scene to conduct a fire cause determination investigation must be aware that fire scenes present a number of residual dangers that may be obvious and not so obvious (i.e. – fire weakened structures, holes in floors, accumulations of standing water, debris etc.). One of the less obvious dangers relates to the “quality” of the air at an incident site. Whenever possible, investigation activities in contaminated atmospheres should be delayed until such time as all phases of the fire have been fully extinguished and the air quality can be ascertained via air monitoring equipment. If protective measures are not possible, no entry shall be made to any scene until it is safe to do so.

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9. Air quality monitoring within the scope of operational capability possessed by the department shall be conducted prior to entry into a fire scene to identify and evaluate atmospheres IDLH by personnel utilizing Self Contained Breathing Apparatus (SCBA). Air monitoring should also be done periodically at regular intervals during the course of an investigation, and particularly when large amounts of debris are disturbed by investigators to ascertain that the atmosphere has not become contaminated or compromised.

10. When entry into contaminated atmospheres by staff is deemed absolutely necessary, SCBA and appropriate other PPE shall be worn. The use of SCBA, the PAPR or other type of respiratory protection **MUST** be considered in ALL circumstances. NOTE: The PAPR is **not** an acceptable alternative to SCBA where an IDLH atmosphere exists (i.e. - oxygen deficient). SEE OG 223 - USE OF RESPIRATORY PROTECTION DURING FIRE INVESTIGATIONS.

11. Staff shall consider the physical condition (including size and location) of the scene to be examined and where darkness creates an unmanageable safety risk to personnel who might be assigned to an investigation, the Incident Commander shall arrange for the scene to be held until daylight creates more optimal working conditions.

12. Staff conducting a fire investigation shall assess the scene and structure for integrity and any identified hazards are to be eliminated. If it is not possible to eliminate hazards, access shall be restricted. If access to structurally unstable areas is deemed necessary for the purposes of the investigation, appropriate precautionary measures shall be applied prior to entry. The status of all utilities must be determined prior to any investigation being undertaken. The presence of alternative power supplies such as emergency generators and/or photovoltaic arrays must also be determined and addressed.

13. Protective coveralls such as spun-bonded olefin (or equivalent) shall be donned when absorption of hazardous materials through the skin is an identified risk. Consideration shall be given to eye protection as toxins can be absorbed through the eye.

14. Firefighting turn-out (bunker) gear shall be donned when impact, cut, abrasion or environmental conditions are a potential risk of injury.

15. Adequate and effective ventilation should be in place throughout the investigation. Altering the structure or opening closures should be considered when it would not compromise the integrity of the fire scene.

16. Fire investigations in hazardous conditions shall be conducted with a minimum of two personnel and each shall have a communication device readily available at all times. In addition, adequate lighting should always be provided and investigators should consult MSDS sheets for hazardous products known to be stored on site whenever possible.

17. The collection of physical debris or other elements/items from a fire scene should be avoided in most cases – document the presence of such items photographically if possible/practical. Where it becomes necessary to remove items from a fire scene, the investigating staff member must consider the issue of spoliation and take steps to protect the integrity, security and continuity of the item(s) being seized. Any item seized must be returned to its rightful owner or his/her agent at the conclusion of the investigation.

18. If during any fire investigation being conducted by GFD staff members, any evidence is found that may be associated to something of a criminal nature (i.e.; intentional application

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of an ignition source to a flammable or volatile liquid, etc.), the investigation shall be stopped immediately without further disrupting the scene and the OPP and OFMEM are to be contacted immediately and the Fire Chief shall be advised).

19. All "Essential Level Fire Investigations" shall be documented in a report that contains the following information:

- a) Incident Data – Incident number, date, location, extent of injuries/damage etc.
- b) Incident Summary – a summary of the incident
- c) Relevant Times – include a copy of the full (long) CriSys report
- d) Involved Persons – list all persons (owner/occupant, witnesses, neighbours interviewed, police/OFMEM investigators, insurance representatives etc.)
- e) Items Seized (if any, and disposition)
- f) Summary of Investigative Steps Taken – chronicle the major investigative steps taken
- g) Fire Cause Hypothesis – list all potential fire causes
- h) Conclusion – summarize results of the investigation, state cause if determined
- i) Other - (Include any relevant photographs/images and any media release(s))

Enhanced Level Fire Investigations

20. An Enhanced Level Fire Investigation shall only be conducted by a member of the OFMEM. Note: This does not prohibit GFD staff from assisting a member of the OFMEM who is conducting an investigation pursuant to the authority of the FPPA (see sentence 5) or a Criminal Code Search Warrant (where so authorized).

RESPONSIBILITY:

It is the responsibility of all staff to comply with the provisions of this Operating Guideline.

DEFINITIONS:

"Active fire scene" means a fire scene where fire suppression activities (including overhaul) are still being conducted.

"IDLH" means Immediately Dangerous to Life or Health.

"PAPR" means a departmental issued Powered Air Purifying Respirator.

REFERENCES:

- Fire Protection and Prevention Act, S.O. 1997, as may be amended
- Section 21 Committee Guidance Note GN-4-09, Respiratory Protection
- Section 21 Committee Guidance Note GN-4-13, Personal Protection During Fire Investigation Operations
- Section 21 Committee Guidance Note GN 5-2, Minimum Safety Considerations for Working Alone
- MLFD OG 203, Use of Breathing Apparatus
- MLFD OG 223, Respiratory Protection During Fire Investigations
- MLFD OG 223, Respiratory Protection During Fire Investigations
- MLFD OG 810, Operational Level Fire Investigations
- NFPA 921, Guide for Fire and Explosion Investigations, 2014 Edition
- IFSTA, Fire Investigator, Second Edition