



GUAM FIRE DEPARTMENT
AGANA, GUAM

North Command

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GENERAL ORDER:	Date of Issue: 3/6/87	Effective: 3/6/87	No. 87-02
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Index As:	FIRE ARSON INVESTIGATION - STANDARD OPERATING PROCEDURES		

SUBJECT: Fire Arson Investigation - S.O.P.

PURPOSE: To identify the investigative functions and to relate the need to arrange them in chronological order relative to their occurrence during the various stages of a fire alarm. This will help the investigator to be keenly aware of his jurisdictional responsibility and be able to effectively interface with others, who will be concerned with the same investigation.

THIS ORDER CONSISTS OF THE FOLLOWING NUMBERED SECTIONS:

- I. INTRODUCTION
- II. DETERMINING CAUSE AND ORIGIN
- III. DETECTION OF HYDROCARBONS
- IV. TOOLS AND EQUIPMENT
- V. EVIDENCE
- VI. FIRE SCENE PHOTOGRAPHY
- VII. FIRE INVESTIGATION RECORDKEEPING
- VIII. ROLE OF THE FIREFIGHTER
- IX. DEVELOPING INFORMATION FOR WITNESSES

I. INTRODUCTION

The immediate investigation of all fires is one of several activities that the Guam Fire Department have instituted to better serve the community.

A fireground investigation is a systematic search of the fire scene for information about the fire. It is to reconstruct the events that led to the fire, to seek out the origin and cause of the fire.

Basically, the investigation of a fire is the comprehensive answering of many questions, which should be asked in a systematic and chronological manner. These questions are asked by the investigator as Standard Operating Procedures (S.O.P.).

The responsibility of fire investigation does not end with those assigned to investigation duties, it is shared by every officer and firefighter on the fireground. The investigator could be anyone so designated by the Fire Chief. The district chief or company commander at the fireground shall perform the investigation as deemed appropriate. Actually, every firefighter on the fireground should consider himself a member of the investigation team.

Response - Are there suspicious observations, factors, circumstances or impediments to be noted?

Suppression - Are there questions regarding exposures, entry, occupants, unusual conditions, during suppression and salvage which cause suspicion?

Preliminary Investigation - After evaluation are the questions asked earlier still unresolved? Is arson suspected? Is further investigation necessary? What is the point of origin and the cause of the fire? Are your theories valid regarding whether the fire is accidental or incendiary?

Secondary Investigation - Is an arson team or task force necessary? Should criminalists be called to assist? Has there been a fire death(s) which necessitates determination of cause? Have photographs and evidence samples been properly handled and documented? Is there a corpus delicti and a motive? Is further investigation necessary? Have you consulted with the Attorney General's Office and is there a case for prosecution?

The questions, when answered in a systematic manner will allow a fire investigator or team, to form a basic S.O.P.. This General Order will attempt to identify some of the functions necessary when answering these questions and will attempt to, basically, expound on them.

II. DETERMINING ORIGIN AND CAUSE

The fire investigator must determine the point of origin, so that he can progressively determine the cause of the fire. In order for an investigator to determine the specific area or areas where the fire started, he must reconstruct the fire with the physical evidence present at the fire scene. The investigator shall study the burn patterns and measure the depth of char of the affected floors and ceilings and walls of the structure.

The investigator shall work from the area of least burn damage to the area of most severe damage, so that the origin or area of origin can be pinpointed. In doing the scene examination, the investigator shall be observant of the burn patterns and shall locate the lowest point or points of burn in the structure. The lowest point of burn shall be scrutinized by the investigator as it indicates an area of intense heat or prolonged burning. In observing the low burn points, the investigator shall clear the affected area, so that it can be inspected for abnormal burn patterns or flow pattern. If an irregular flow pattern is observed, then the area shall be checked for the presence of accelerants or flammable liquids, which could be determined to have been extraneous to the area. If the investigator has access to a hydrocarbon indicator, it shall be utilized to ascertain if readings can be obtained to substantiate the investigator's suspicion. The investigator shall take samples of the affected area even if the indicator does not show positive readings, so that the samples can be checked with the gas chromatograph or other more sophisticated laboratory tests that are available to the arson investigator.

In examining the low point or points of the fire, the investigator shall check for the logical source of energy which could have been the cause of the fire. It is crucial that the investigator be methodical in searching through the fire debris. The investigator must be observant for any evidence that would or could have caused the fire. If an investigation is not sifting the debris in a systematic manner, he could very easily overlook items of evidence such as matches or other incendiary devices, which could prove beneficial in determining the fire to be incendiary.

The investigator shall be observant as to the amount of floor damage as compared to the amount of ceiling damage. This could aid the investigator due to the realization that in normal fire damage, the floor is usually damaged one third the amount of ceiling damage. If abnormalities are observed with respect to the floor damage, then the investigation must determine as to what caused the excessive damage. In checking the floor damaged areas, the investigator shall inspect the areas adjacent to entry or exit doors as it is common for an arsonist to set the fire as he is exiting the structure. The doors of the structure, if present, shall be checked by the investigator for any signs of forcible entry. The doors shall be inspected for burn patterns or heavy charring of wood. If the charring on the door is heavy at the base of the door, it may be an indicator of an abnormal burn pattern.

With respect to the windows of the structure, they shall be inspected for any signs of forced entry. The glass of the windows and the position in which it is found can be a valuable lead to the arson investigator. The smoke deposits on the windows shall be examined as a heavy carbon deposit on the glass is a good indication of a slow smouldering fire. The cracking effects on the glass shall be noted as it could give an indication as to whether the fire was rapid or slow burning in nature.

The investigator shall in the course of his investigation rule out all accidental causes of fire. Specific attention shall be directed at the area of origin and the presence of any appliances or electrical equipment at or near point of origin. If electrical equipment is present, then the investigator shall inspect the equipment and electrical circuitry back to the electrical panel board of the structure, to ascertain if any electrical malfunctions can be found. In doing this, the investigator shall look for shorting of wires and proper functioning of over current protection devices. The investigator shall observe any indications of tampering with the protective devices or electrical circuitry. If the investigator is of the opinion that the fire is electrical in nature, but lacks the expertise to confirm his suspicion, then he shall contact an electrical technician to examine the electrical circuitry. If an appliance is suspected of being the cause of the fire, the item shall be taken as evidence and checked by an electrical technician to corroborate the investigator's opinion. If the appliance is too large to remove, then an on scene inspection shall be done by an electrical technician.

The arson investigator shall eliminate spontaneous combustion as source of the fire. This can be done by ascertaining from the owner/occupants as to whether any items conducive to spontaneous ignition were at or near the point of origin. Once this information is obtained, the investigator shall reinspect the scene for any traces of the material which would have caused the fire.

The arson investigator must rule out any type of electrical storms, which could have caused the fire and as normal procedures, the weather conditions at the time of the fire should be noted.

The elimination of all natural or accidental causes of fire shall be accomplished by the investigator before he can class the fire as incendiary in nature.

III. DETECTION OF HYDROCARBONS

Once it is recognized by extensive char patterns that a hotter than expected fire for ordinary "Room and contents" has been fought, coupled with the lack of an accidental source of ignition, the Officer-in-Charge of the fireground shall call for an investigator. Since this action has been set in motion, the OINC shall next secure the premises, not allowing any unauthorized people within the structure and to limit his/her own personnel from any unnecessary travel through the area. When the investigator arrives, besides the normal cursory walk around observing exterior damage, patterns, access, footprints, lay of the land, etc., they may have waiting, willing witnesses that need to have statements filled out before they are lost forever.

by putting the witnesses to work right away (if any), you have involved them in your case and allowed them to leave the scene as soon as possible.

Asking the Officer-in-Charge who were the first firefighters to indicate stubbornness of fire extinguishment or flashback problems would be the next action. Odors prevalent during overhaul could be an indicator of hydrocarbon accelerant.

Samples of hydrocarbon accelerant must be found, collected, packaged, sealed in proper non-contaminating containers and analyzed by an accredited lab recognized acceptable by the court of that jurisdiction. Statements made by arson investigators on the stand can not be: "We found positive traces of gasoline in that living room." The statement should be: "We took samples of a liquid that had the odor of what appeared to be gasoline." The lab report will state if it is positively gasoline or not through a gas-liquid chromatograph. This device takes a heated gaseous sample from the sealed "head space" of a liquid sample container collected at the scene. It may be contained in a piece of wooden flooring out from worn low spots beneath doorways from behind baseboards, carpet or carpet foam padding. A control sample of the same room flooring (on another side of the room for example) is necessary for comparison.

A field device called a combustible gas detector (sniffer) has been on the market about five (5) years to aid the investigator in the search for hydrocarbons, however, it is not to replace the formal lab analysis necessary for court preparation. This hand-held instrument allows the user to monitor samples of air near the floor or through debris without having to hug the floor or use one's own nose. Another method of getting "field" results before relinquishing the fire scene is to run suspected samples through a portable gas-liquid chromatograph, which is a smaller version of the lab equipment but mounted in the rear of a fire department step van. Here a thorough evaluation can be made at the scene without waiting for weeks to find out formal lab results. (Fact, instead of "By-Gosh - By-Guess) This type of equipment, unfortunately, is many times out of reach of smaller departments due to cost, however, if jointly shared by several jurisdictions, it could be a worthy venture.

IV. TOOLS AND EQUIPMENT

The primary responsibility of every fire investigator is to determine the true cause of the fire. However, without an open mind, positive attitude and correct tools, the investigator will not be able to properly determine the cause.

The following is a list of basic items needed to be able to conduct a proper fire investigation. Each investigator may want to add or change this list.

1. Notebooks
2. Pens and pencils
3. Felt tip markers
4. Colored pencils

5. Sketch pad or graph paper
6. Envelopes
7. Report forms
8. Straight edge ruler
9. 10 Ft. and 50 ft. tape
10. Measuring wheel
11. Flashlights or pen lights
12. Tape recorder
13. Plastic bags with assorted sizes
14. Paper bags with assorted sizes
15. Evidence tape or gammed labels
16. Fire scene area securing tape
17. Large garbage bags and boxes
18. Evidence collection cans with assorted sizes
19. Evidence tags
20. Mason jars
21. Pill bottles
22. Photographic equipment: (a) 35 mm camera; (b) flash; (c) extra batteries; (d) extra film; and, (e) wide angle and 80 - 200 telephoto lenses
23. Tool box (drawing type works best)
24. Roll of electrical tape
25. Spool of 25 lb. test fishing line or heavy string
26. Small trap
27. Device for measuring depth of char
28. Several sets of rubber gloves or surgical gloves
29. Coveralls
30. Comfortable working boots or rubber boots
31. Goggles
32. Rags
33. Waterless hand soap
34. Hard hats
35. Tool pouch with assorted general tools: (a) assorted flat and phillips screwdrivers; (b) regular pliers; (c) small and large type channel-type pliers; (d) hand saw; (e) electricians pliers; (f) diagonal pliers; (g) needle nose pliers; (h) two (2) pairs of hemostats (medical type); (i) two (2) small pipe wrenches; (j) carpet knife with extra blades; (k) hacksaw; (l) long bladed knife; (m) small pry bar with nail puller; (n) 8 oz. claw hammer; (o) putty knife; (p) carbide-tipped scriber; and (q) set of allen wrenches
36. Tablespoon
37. Small folding shovel
38. Coal shovel
39. Wisk broom
40. Small rake
41. 2" Paint brushes
42. Gas meter locks
43. Sand sifting screens
44. Magnifying glass
45. "No Trespassing" and "Arson" signs
46. Fuse puller
47. Outlet polarity tester
48. Voltmeter

49. Explosimeter
50. Stapler
51. Syringes
52. 20 Lb. water fire extinguisher
53. One hour air pack (Scuba) unit
54. Sniffer (Hydrocarbon Detector)
55. Portable two-way (walkie-talkie) radio

The above is only intended as a general checklist and not a specific guide. Experience and common sense will dictate the manner in which the tools and equipment will be used. Remember...the tools will take care of you if you will take care of the tools!

V. EVIDENCE

In all cases of suspicious or incendiary fires, a search for physical evidence shall be conducted. This evidence is of the utmost importance in the prosecution of arson cases. Because of this importance, certain safeguards must be taken.

The proper methods used in removing evidence from its location at a crime scene and the storage and transportation to a forensic laboratory are paramount. Upon locating evidence at an incendiary fire, the first step that shall be taken is to properly photograph and measure its position in relation to the crime scene. By doing this initially, it reduces the potential for defense attorneys to raise objections with regards to altering or tampering with the scene.

The next important step in the proper collection of physical evidence from a crime scene is the marking and storage of the samples. This is accomplished by using a new air tight container into which the collected evidence is placed. It is of the utmost importance to remember that the evidence container must be unused so that a question of contaminated evidence cannot be used as a defense.

Equally important with regard to evidence seizures and transportation to the testing facility is a term referred to as "Chain of Custody". Simply stated this term means, evidence that is removed by an investigator from a fire scene remains in his custody pending its transportation to the laboratory. The ideal way to eliminate any potential break in, this custody is for the investigator to transport the evidence himself directly to the laboratory. "Evidence is the foundation on which a case is built. In order to be presented in court, the evidence must be admissible, competent, relevant and material."

VI. FIRE SCENE PHOTOGRAPHY

The photographer shall be called to the scene any time there is a working fire. It will be the duty of the photographer to remain on the fireground until the entire scene investigation is completed.

The photographer has certain photographs he shall take during the extinguishment phase of the fire and during the investigative phase after the fire has been extinguished. Photographs that shall be taken during the working phase of a fire include:

- (1) Overall views from all sides
- (2) Fire progression
- (3) Spectators
- (4) Position of apparatus and equipment

After the extinguishment phase, the investigative phase starts and it is extremely important that the photographer obtains photographs to substantiate the origin and cause of the fire. Photographs to be taken during the investigative phase include:

- (1) Photographs of the exterior from all sides. Also, do not overlook damage to exposures.
- (2) Start interior shots from the least amount of fire damage and progress to the greatest amount of fire damage.
- (3) Progress through the scene one step at a time until getting to close-up shots of cause contributing factors.
- (4) Photographs of evidentiary value should be moved to the photo lab if at all possible, otherwise make photographs at the scene.
- (5) After finishing with the investigation, make one more walk around and through the scene to make sure all photographs needed have been taken.

VII. FIRE INVESTIGATION RECORDKEEPING

Report writing is considered by many to be one of the most unenjoyable and time consuming aspects of fire investigation. However, if reports are done accurately and concisely, it can be one of the most useful resources a fire investigator has. There are basically four (4) types of reports a fire investigator uses, they are field notes, preliminary, investigation and prosecution reports. Field notes are notes usually made by the investigator while at the scene of the fire. These notes help him to recall names, incidents and circumstances, which pertain to the fire scene. These notes should state information such as the month, date, year, time of day and incident number. The investigator shall also make note of names, addresses and birth dates of all persons interviewed. He shall note the owners name and insurance company, the weather at the time of the incident and which companies responded. Field notes should contain sketches of the damaged property and what photographs were taken. They shall include the evidence taken, injuries, place of origin, fire cause and method of extinguishment. All these notes will aid the investigator when preparing his case for court. These notes are the only notes the investigator can use in court.

The second type of report is the preliminary report. These are usually filled out by firefighters, fire officers and police officers. Preliminary reports are brief. They can be preprinted forms with blank spaces to be filled in or checked. There shall also be a space for a summary of the incident. The purpose of these reports are to aid the investigator in gathering facts.

The investigation report is "The official record of the activity and findings of the investigator and is written in a narrative form. Included in this report shall be a description of the building, conditions observed by responding firefighters, firefighting operations, details on the cause and how it was determined."

The fourth and final report is the prosecution report. This report shall contain all the documents, statements, photos and evidence to present the case in court.

Fire investigators can be successful if sufficient time and efforts are expended in writing neat, accurate and complete reports.

VIII. ROLE OF THE FIREFIGHTER

A. When the fire is reported. (dispatch oriented)

1. Attempt to get name of caller and call back number.
2. Notation of time of call.

B. Observation enroute (incorporate with size up).

1. Weather conditions (i.e., wind direction, if apparent, generalization of temperature 10°, 20°, 30°, etc.)
2. Persons or vehicle in the immediate area, leaving the area or moving toward fire scene.
3. Visual condition of fire scene. (scan - observe) For collaboration purpose.

C. Arrival at fire scene.

1. Type of smoke - note color, odor and density. Normal for that building or unusual.
2. Color, configuration of actual flame, visible on arrival. Mental note, normal or not.
3. Extent of structure involved at arrival, also, rapidity or not normal spread of fire.

D. Fireground operations.

1. Location of initial or subsequent attack on fire - behavior of flame.
2. Concentration of most fire and location. Again check for rapid or unusual spread.
3. Unusual condition of structure - doors standing open or not locked, windows broken out or open wide.
4. Note odor or fire reaction when extinguishing agent is applied.

E. After containment of fire. Final extinguishment and mop up operations shall be handled with care to avoid destruction of evidence.

1. Check for point of origin, disturb nothing which may contain fingerprints, accelerant, etc..
2. Take note on interior devices, sprinklers, alarms, utility piping and valves for tampering.
3. Hold all observations and comments solely for the investigator. Do not discuss with other firefighters, witnesses, media or any other person(s), except immediate supervisor or investigator.

IX. DEVELOPING INFORMATION FOR WITNESSES

It is a well established fact that the criminal investigation, including arson investigation, cannot be accomplished without the oral communication between the investigator and the witness.

The witness is defined as an individual, who has knowledge of facts of occurrence sufficient to testify in respect thereto.

One must remember that a witness is interviewed as opposed to an interrogation of a suspect. Contact your prosecuting attorney and familiarize yourself with the law and procedures governing the interviewing of witnesses and interrogation of suspects. A witness may become a suspect or a person originally regarded as a suspect may turn out to be a witness.

Try to seek out an experienced and successful police or fire investigator and solicit his advice on the subject of witness interview. Be prepared with knowledge of all available facts before the interview. Avoid "coaching" the witness to produce the answers, but the questioner shall bring out and record the actual statement of the witness without coaching.

Make every reasonable effort to maintain order and privacy during the interview. You are there to seek out information. Maintain control of the interview session in a polite and friendly manner. At the early stages of the conversation, talk to the witness about something that he/she is interested in talking about. Try to create an atmosphere of friendship and try to merge with his environment and surroundings. This will create a more

favorable atmosphere aligned to obtaining information than the traditional type, who may receive cooperation only in theory.

The interview shall be conducted with an open mind and continued throughout the interview. Although, the investigator may have a knowledge of what happened and how it happened, he should not reflect this to the witness. The investigator will be able to recognize coverups, honest mistakes or ignorance of the witness well before the end of the interview.

Refrain from grabbing pen and paper during the early stages of an interview. This has a tendency to tighten the witness. Instead, be as sure as one can be that all the information received is about all one would get from this witness. Be sure that it is factual in regard to witness' knowledge of the fire. Then this is the time to suggest recording or the taking of a statement.

Be thorough. Do not be satisfied with half an answer. Sometimes it is good to leave the doubtful and move on to something else. After moving into other area with the witness, return to the half answer or doubtful and the witness may supply the complete answer uncertain of his/her earlier response.

Be patient and tactful. Try to avoid wherever possible, antagonizing or embarrassing the witness. Avoid providing him/her with the impression that you are guessing, bluffing or that you do not know what you are talking about.

In general, the interviewer must win the trust of the witness through sympathetic non-judgmental and professional conduction of the interview.


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