Norwich Fire Department

# STANDARD OPERATING PROCEDURES

**Adopted: December 18, 1995**
**Current Version: January 1, 2007 as Revised on April 24, 2007**

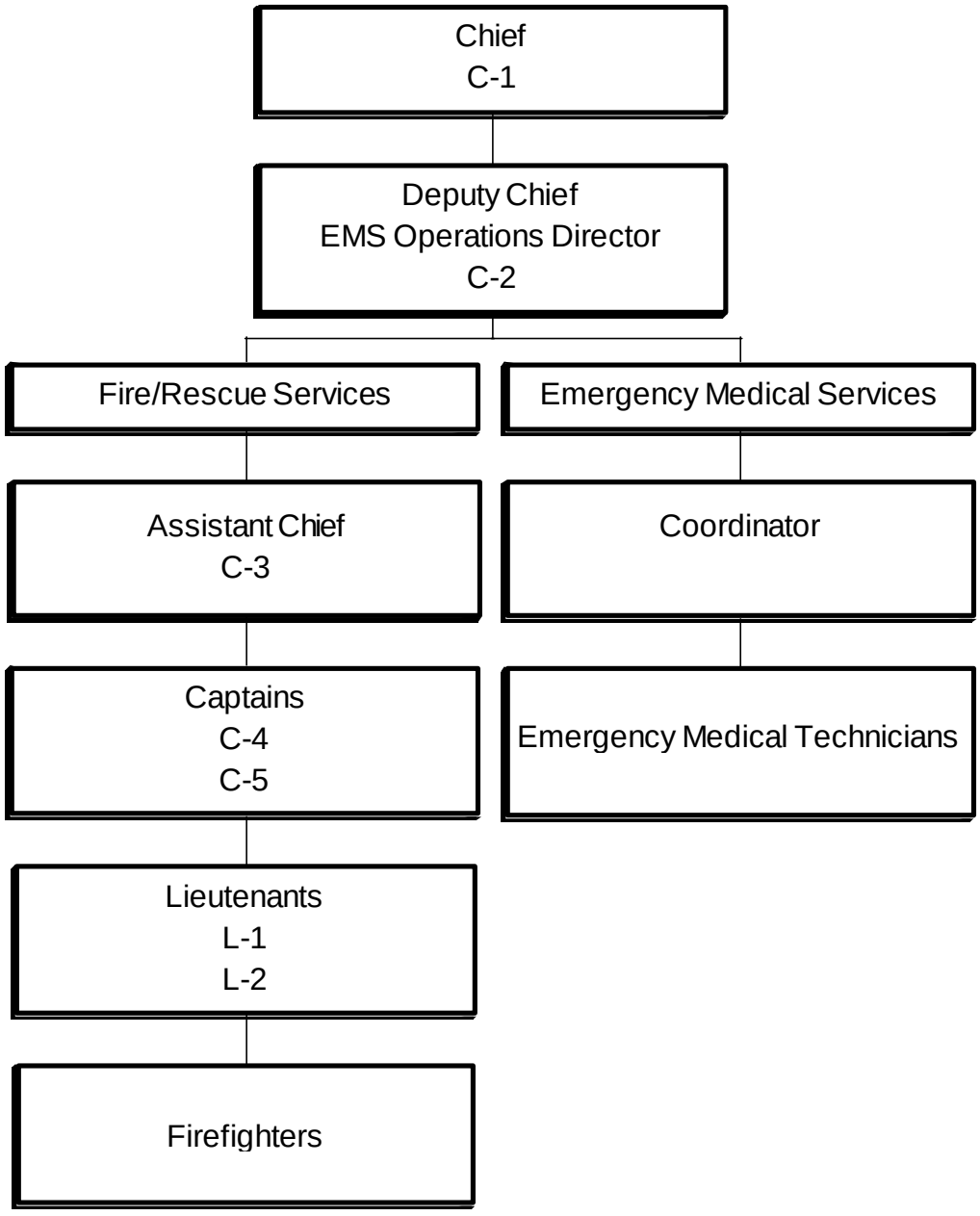
Table of Contents

# 1. Introduction

1.1.1 These Standard Operating Procedures (SOPs) are intended for the guidance of the members of the Norwich Fire Department and are provided to improve firefighting and emergency medical services personnel safety and increase operational efficiency. The SOPs include the supplementary material in the appendix as if fully incorporated in this document. They are not intended to cover every duty or situation but are intended to provide a general framework for fire department operations. In addition to the responsibilities and procedures described, personnel will perform other procedures and duties as may be required of them by their superior officer. Ignorance of these SOPs will not be an excuse for non-compliance. It is the responsibility of all members to thoroughly familiarize themselves with the Standard Operating Procedures and operate in accordance with the SOPs.

## 2. Organizational Structure

The fire department is composed of two divisions the Fire/Rescue Division and the EMS Division. The following is the organization chart.



# 3. General Rules

## 3.1 All Members

3.1.1 A pager will be issued to all responding personnel.

3.1.2 Any loss or damage to fire department facilities, apparatus, equipment or protective gear shall be immediately reported to the Deputy Chief or Chief.

3.1.3 Any motor vehicle accident involving fire department apparatus shall be immediately reported to the Deputy Chief or Chief and the proper forms filled out and provided to the Deputy Chief or Chief.

3.1.4 When reporting to the scene, you shall report directly to the Incident Commander, Command Post, or when staging has been established, to the staging officer.

3.1.5 Before leaving the scene or the station, you shall get permission from the Incident Commander or highest-ranking officer.

3.1.6 No modifications shall be made to issued equipment or gear. Department provided hazardous materials and EMS emblems may be affixed to the helmet.

3.1.7 Alcoholic beverages shall not be present, transported or consumed on fire department property or vehicles.

3.1.8 Members must exercise caution in the consumption of alcohol prior to a response or training. Individuals must be able to determine their fitness for duty based on the amount of alcohol consumed over specific time periods.

3.1.9 The following federal guidelines are from The Omnibus Transportation Employee Testing Act of 1991, which prohibits alcohol and controlled substance misuse, which could affect employee performance in a safety-related function. This includes:

3.1.9.1 The use of alcohol on the job.

3.1.9.2 The use of alcohol during the four hours before performance of a safety-sensitive function.

3.1.9.3 Performing a safety-sensitive function while having a Blood Alcohol Concentration (BAC) of 0.02% or higher.

3.1.9.4 Exhibiting behavior and/or the appearance of alcohol misuse while performing a safety-sensitive function.

3.1.9.5 The use of alcohol following an accident.

3.1.9.6 Reporting for duty or remaining on duty in performance of a safety-sensitive function while using any controlled substance unless a physician has advised him or her that the substance will not adversely affect the ability to safely operate a commercial motor vehicle.

3.1.10 Any member that uses any prescription medication, over-the-counter drug, alcohol, or other substance that at all impairs performance shall not respond to emergencies. Violation of this policy shall result in immediate suspension from the Department pending an investigation.

3.1.11 The Fire Department does not tolerate the possession, use and/or sale of illegal drugs. Violation of this policy shall result in immediate suspension from the Department pending an investigation.

3.1.12 The senior member of the first responding fire company is responsible for seeing that the Incident Report is completed

3.1.13 The senior member of a team providing patient care is responsible for seeing that the

Patient Care Report for that patient is completed. The PCR shall be turned in by the end of the next business day. If an AED is used a AED Report shall be filled out and attached to the PCR.

3.1.14 Helmets or EMS hard hats and Class 3 traffic vests shall be worn whenever operating on or adjacent to a road or highway.

3.1.15 ANSI Z87.1-2003+ safety glasses shall be worn whenever there is risk of an eye injury.

3.1.16 Any member that receives a ticket for a moving traffic violation or is involved in a motor vehicle accident that would be reportable under Vermont law, even if in another state, shall report the incident to the Chief or Deputy Chief within 48 hours of the incident.

3.1.17 Any member that receives a ticket for a moving traffic violation or is involved in a motor vehicle accident while responding to a call shall immediately report the incident to the Chief or Deputy Chief and a copy of the ticket or accident report shall be provided to the Chief or Deputy Chief as soon as available.

3.1.18 Any work related injury shall immediately be reported to the Chief or Deputy Chief. A First Report of Injury report shall be completed within 72 hours of the injury.

3.1.19 Members shall attend required training on NIMS, ICS, bloodborne pathogens, hazardous materials, AHA BLS Healthcare Provider and have appropriate fit tests.

3.1.20 All members will wear PPE as required by the Bloodborne Pathogen Exposure Control Plan or other portions of these SOPs.

3.1.21 Members shall comply with the Bloodborne Pathogen Exposure Control Plan, Personnel Policies, Financial Policies, Job Descriptions and other applicable town policies, which are made a part of these SOPs by reference.

3.1.22 PPE shall be kept clean. The washer/extractor at the fire station has cycles for turnout gear, normal and EMS. Members shall wash their turnout gear immediately following any interior firefighting or similar firefighting function where the turnout gear was exposed to smoke. This is to remove possible contaminants including cyanide.

3.1.23 Members shall wear seat belts when responding to an incident or the station in their own vehicle (POV).

3.1.24 Incident reports and patient care reports contain information that may be private and confidential and/or protected by law from release. The particulars or details of any EMS incident shall only be discussed within the EMS Division for quality assurance and quality improvement purposes or with other EMS providers involved in the incident such as transport or emergency room personnel. No incident report will be released without a written request for the report and approval of the chief. No patient care report will be released without a written request including a properly authorized HIPAA release form and approval of the chief.

### 3.2 Fire/Rescue Division

3.2.1 All firefighting personnel shall wear full protective equipment (PPE) when on the fireground. Full protective equipment includes helmet with faceshield, coat, pants and gloves for all firefighting personnel, and in addition hood and Self Contained Breathing Apparatus (SCBA) for interior operations and operations in hostile (IDLH) atmospheres. The Incident Commander may allow the removal of protective equipment when conditions dictate and safety is not compromised.

3.2.2 All firefighters, with the exception of chief officers, shall keep their PPE at the station.

3.2.3 All firefighters, with the exception of chief officers, shall respond to the fire station and

respond to an incident on fire department apparatus. This also applies to EMT /Firefighters when both Fire/Rescue and EMS are dispatched to an incident.

3.2.4 All firefighting personnel shall wear safety belts or a safety line while working off the aerial ladder.

3.2.5 Firefighting personnel shall be the only persons to work off the aerial ladder. This may be waived when the Incident Commander finds it necessary to do so.

3.2.6 When backing a vehicle, another person shall monitor the rear of the vehicle to ensure there is a safe and clear way.

3.2.7 Seat belts shall be worn while driving and riding in fire apparatus.

3.2.8 Faceshields and safety glasses or goggles will be worn whenever the situation dictates, such as grinding, cutting, etc.

3.2.9 Emergency brakes and wheel chocks will be used whenever the vehicle is being used outside the station. It is the responsibility of the vehicle driver to place the wheel chocks.

3.2.10 All firefighting personnel shall attend fire/rescue training and drills normally held on the second and third Monday of each month.

3.2.11 All members will wear full PPE when responding to an incident in fire department apparatus. In addition interior qualified members shall don SCBA when responding to any incident that may involve fire or an IDLH atmosphere. This includes, but is not limited to, structure fires, odors of smoke, gas odors, fire alarms, CO alarms and similar incidents.

3.2.12 All members shall be issued the following protective gear that meets the requirements of NFPA 1971: *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*:

- Fire Helmet
- Fire Coat
- Fire Pants
- Boots
- Gloves
- Accountability Tags
- Hood (Interior qualified firefighting personnel)
- SCBA facepiece – If available (Interior qualified firefighting personnel)

3.2.12.1 Members may purchase their own helmet and boots if they meet the requirements of NFPA 1971 including a faceshield with prior approval of the Safety Officer. Helmet shields shall conform to fire department standards.

**3.3 EMS Division**

3.3.1 The EMS division is licensed at the EMT-I level but provides equipment to members at the EMT-B level. EMT-Is may provide patient care consistent with their certifications if the equipment is available from the transporting service. Hanover Fire Department provides EMS services and transport to Norwich under contract and is licensed at the EMT-P level. Hartford Fire Department provides EMS services and transport for Podunk Road and Tigertown Road from the Hartford/Norwich town line to Sue Spaulding Lane.

3.3.2 The minimum level of certification for a member of the EMS division of the fire department is NREMT-B and Vermont EMT-B.

3.3.3 All patient care shall be provided in a manner that is consistent with the latest version of the Vermont Department of Health Emergency Medical Services Protocols.

3.3.4 All EMS personnel shall attend EMS training drills normally held on the first Monday of each month.

3.3.5 All members will be issued PPE that complies with NFPA 1999: *Standard on Protective Clothing for Emergency Medical Operations.* Non NFPA 1999 compliant PPE shall not be used.

3.3.6 Active members will be issued basic EMT equipment bags, if available. Some members may be issued EMT equipment bags that include oxygen and some members may be issued an AED. There may be some special cases where EMT-Is are issued additional equipment consistent with their certifications. An example of this would be an EpiPen. It is the responsibility of the member to maintain the department issued equipment in good working order, replace items when out of date and keep the bag fully stocked. Replacement supplies can be used from the stock at the fire station after noting on the inventory sheets that supplies have been taken. Members with oxygen cylinders shall replace the cylinder when less than one half full. Members with an AED shall check the AED weekly and fill out the department weekly checklist.

3.3.7 Members with an AED may be issued a portable radio, if available.

3.3.8 Basic EMT equipment including oxygen and AEDs are carried in the police cruisers and Engine 1. Engine 1 also has 2 E size oxygen cylinders, two backboards and a Pulse CO Oximeter.

3.3.9 Members who arrived at a scene in their own Privately Owned Vehicle (POV) shall leave adequate room for other responding apparatus. In general this means that POV's will not be parked in a driveway that is shorter than 500 feet long and least 50 feet from the end of a driveway on the roadway. The first arriving member at an incident with a Green Bag and/or AED may park closer to the incident if there is room at the scene for the ambulance to turn around. At an incident involving a motor vehicle members POV's should be parked on the same side of the roadway and beyond the accident to allow adequate room for fire equipment, ambulances and chief officers.

3.3.10 When providing single patient care the senior EMT by certification or experience shall be the team leader for that patient. When operating at an incident with multiple patients or operations with other functions team leaders will be assigned by Command.

3.3.11 The following is an excerpt from the transport agreement with Hanover Fire Department.

> It is agreed by both parties that NORWICH is in charge of the patient until HANOVER arrives. Change of patient care can take place after HANOVER arrives. Should patient care be started at an advanced level, NORWICH will transfer the care of the patient to HANOVER having the same level of certified personnel or above. Should the HANOVER not have the certified personnel, NORWICH will remain in the charge of the patient until the patient is accepted by the receiving facility.
>
> When patient care is transferred, NORWICH will provide HANOVER with a written record of the patient, to include but not limited to: patient condition, mechanism of injury, patient's chief complaint, vital signs, treatment administered. NORWICH will retain a copy of this patent care

3.3.12 Members will be issued accountability tags

## 4. Red Light Permits

4.1.1 This section provides department policy on the use and issuance of a red light permit to members and for the use of red lights and sirens in personal vehicles as provided for in 23 VSA § 1015.

4.1.2 The member shall request permission to obtain a red light permit from the Chief on a form provided by DMV.

4.1.3 The member shall have been a member of the Norwich Fire Department for no less than one (1) year and completed their probationary period.

4.1.4 The member shall have taken and passed a state or nationally certified emergency vehicle operations class approved by the Chief. Approved courses include the National Safety Council *Coaching the Emergency Vehicle Operator* and VFIS *Emergency Vehicle Operator* or an NFPA 1451 *Standard for a Fire Service Vehicle Operations Training Program* complaint diver/operator course.

4.1.5 The member must follow all rules, policies and procedures of the Norwich Fire Department and all motor vehicle laws. Failure to follow this policy will be cause for revocation of the red light permit and disciplinary action.

4.1.6 The permitted red light and/or siren shall only be used when responding to emergency calls of the Norwich Fire Department.

# 5. Emergency Vehicle Operating Procedures

5.1.1 Vermont statutes provide a limited exemption for emergency vehicles to some traffic laws with the following statement:

> 23 VSA § 1015 (c) The foregoing provisions shall not relieve the driver of an authorized emergency vehicle from the duty to drive with due regard for the safety of all persons, nor shall such provisions protect the driver from the consequences of his reckless disregard for the safety of others.

5.1.2 Emergency vehicle drivers are subject to all traffic laws unless a specific exemption is provided.

5.1.3 Exemptions for emergency vehicle drivers apply only when the emergency vehicle is responding to a emergency.

5.1.4 Emergency vehicle drivers can be found criminally or civilly liable if involved in an accident, even if they are operating under the provisions of an exemption.

5.1.5 When responding to emergency calls, fire department vehicles may exceed the posted speed limit when it is safe to do so but may not exceed the posted speed limit by more than 10 mph and shall be regulated at all times by existing road and traffic conditions.

5.1.6 Lights and siren shall not be used when providing auto-aid or mutual-aid station coverage. Apparatus shall respond with the flow of traffic. If responding to the scene use lights and sirens as appropriate.

5.1.7 If Command reports to Dispatch “Under Control” assigned equipment shall continue to the scene with the flow of traffic unless returned by Command. For a medical only response EMS Division members not on scene may continue to the scene with the flow of traffic.

5.1.8 If the police department, alarm company or similar reliable source reports through Dispatch that there are no hazards or injuries apparatus shall continue with the flow of traffic until returned by the Incident Commander.

5.1.9 Under wet or foggy or any other hazardous weather or road conditions, fire department vehicles should react pessimistically to the conditions encountered, and in no case exceed the posted speed limit.

5.1.10 Unless all lanes can be accounted for by the driver during an emergency response, fire department vehicles shall come to a complete stop at all red light intersections and negative right-of-way situations such as stop and yield signs.

5.1.11 Fire department apparatus or a member responding in a POV shall come to a full stop when approaching a school bus which is flashing red lights and may proceed only when the flashing red lights are extinguished.

5.1.12 During an emergency response, fire department vehicles should avoid passing other emergency fire vehicles. If unavoidable, the passing arrangement should be conducted through radio communications.

5.1.13 The company officer or front seat passenger shall assist the driver by confirming the incident location, route to the incident and operating radios and conducting other activities such as map reading. The driver shall focus attention on safe operation of the vehicle.

5.1.14 Drivers must consider the dangers their moving vehicle poses to fireground personnel and spectators who may be preoccupied with the emergency, and inadvertently step in front of or behind a moving vehicle.

5.1.15 The provisions of this section apply to members POVs when operating with a permitted red light and/or siren.

5.1.16 Members operating without a permitted red light and/or siren shall obey all traffic laws.

# 6. Fire Department Member Certifications

6.1.1 The basic qualifications for members of the fire department are described in the fire department job descriptions.

6.1.2 Firefighting personnel shall only drive fire apparatus or perform fireground duties that they are currently qualified for.

6.1.3 The following sections define the requirements for obtaining and maintaining firefighting personnel qualifications:

**6.2 National Incident Management System (NIMS)**

6.2.1 The following are the required levels of NIMS training for fire department members

6.2.1.1 All Members

6.2.1.1.1 IS-700: NIMS, An Introduction

6.2.1.1.2 ICS-100: Introduction to ICS

6.2.1.2 Lieutenants and EMS Coordinator

6.2.1.2.1 IS-700: NIMS, An Introduction

6.2.1.2.2 ICS-100 and ICS-200: Basic ICS

6.2.1.3 Captains

6.2.1.3.1 IS-700: NIMS, An Introduction

6.2.1.3.2 IS-800 NRP

6.2.1.3.3 ICS-100, ICS-200 and ICS-300: Intermediate ICS

6.2.1.4 Chiefs

6.2.1.4.1 IS-700: NIMS, An Introduction

6.2.1.4.2 IS-800 NRP

6.2.1.4.3 ICS-100, ICS-200, ICS-300 and ICS-400: Advanced ICS

**6.3 Fire Apparatus Driver/Operator**

6.3.1 Holder of valid Drivers License with no suspensions in last three years.

6.3.2 Satisfactory completion of National Safety Council CEVO or equivalent.

6.3.3 Satisfactory completion of driver/operator training for the identified fire apparatus as shown by the Emergency Vehicle Operator Certification.

6.3.4 Approval by the Chief or Deputy Chief upon recommendation of the Driver Training Officer or Training Officer.

**6.4 Firefighter I, Firefighter II, Fire Officer I and Fire Officer II**

6.4.1 Certification by the Vermont Fire Service Training Council or equivalent as determined by the Council.

6.4.2 Completion of annual continuing education.

**6.5 Hazardous Material Awareness**

6.5.1 Satisfactory completion of approved Hazardous Material Awareness course.

6.5.2 Completion of annual refresher course.

**6.6 Hazardous Material Operations**

6.6.1 Satisfactory completion of approved Hazardous Material Operations course.

6.6.2 Completion of annual refresher course.

**6.7 Hazardous Materials Decontamination**

6.7.1 Satisfactory completion of approved Hazardous Material Operations course.

6.7.2 Satisfactory completion of approved Hazardous Material Decontamination course.

6.7.3 Completion of annual refresher course.

**6.8 Hazardous Material Operations with Propane and/or Gasoline**

6.8.1 Satisfactory completion of approved Hazardous Material Operations course.

6.8.2 Additional training in the hazards of propane.

6.8.3 Adidtional training in the hazards of gasoline.

6.8.4 Completion of annual refresher course.

**6.9 SCBA - Interior Firefighting**

6.9.1 Minimum of Firefighter I and Hazardous Materials Operations for any member not interior qualified on November 1, 2006 and approval by the Chief or Deputy Chief.

6.9.2 Completion of annual qualification and quarterly SCBA refresher courses.

**6.10 Bloodborne Pathogens**

6.10.1 Satisfactory completion of approved annual Bloodborne Pathogens course.

6.10.2 Current Hepatitis B shots or signed OSHA refusal.

**6.11 Emergency Medical Technician**

6.11.1 Current EMT-B or higher certification by the National Registry of Emergency Medical Technicians and Vermont Department of Health.

# 7. Incident Command System

## 7.1 Purpose

7.1.1 This procedure is established to:

7.1.2 Implement the Incident Command System consistent with the National Incident Management System at all incidents.

7.1.2.1 Provide for the safety of personnel operating at emergency incidents through improved management of emergencies.

7.1.2.2 Improve the use of resources and tactical effectiveness.

7.1.2.3 Meet the OSHA regulations requiring the use of an Incident Command System (ICS) for hazardous materials incidents.

7.1.2.4 Meet NFPA Standard 1500: *Fire Department Occupational Safety and Health Program* requirements for the use of an Incident Command System for operations at all emergency incidents.

## 7.2 Communications

7.2.1 All communications shall be clear text.

7.2.2 Radio communications shall be to the receiver from sender using the following model:

7.2.2.1 Request to initiate communications and determine that the intended receiver is listening.

7.2.2.2 Transmit the message or order concisely in clear text.

7.2.2.3 Receive feedback from the receiver to ensure that the message was received and understood.

7.2.2.4 Confirm that the message or order was understood; if not, correct and clarify the message.

7.2.3 The following are the authorized radio signatures:

| **Unit Signature** | **Description** |
|---|---|
| Norwich Engine 1 | 2005 HME |
| Norwich Engine 2 | 2000 Freightliner |
| Norwich Engine 3 | 1989 Ford |
| Norwich Ladder 1 | 1979 Maxim |
| Norwich Tanker 1 | 2002 Freightliner |
| Norwich Forestry 1 | 2001 Ford |
| Norwich C-1 | Chief |
| Norwich C-2 | Deputy Chief |
| Norwich C-3 | Assistant Chief |
| Norwich C-4 | Captain |
| Norwich C-5 | Captain |

| Unit Signature | Description |
|---|---|
| Norwich L-1 | Lieutenant |
| Norwich L-2 | Lieutenant |

7.2.4 Members with a radio who do not have an assigned radio signature shall use the following terminology:

7.2.4.1 Norwich Firefighter "*Your Name*"

7.2.4.2 Norwich FAST "*Your Name*"

7.2.5 The following is an example of the radio communications for responding fire apparatus.

| Unit | Message |
|---|---|
| Norwich Engine 1: | Hartford Dispatch — Norwich Engine 1 |
| Hartford Dispatch: | Norwich Engine 1 — Hartford Dispatch |
| Norwich Engine 1: | Responding to a reported structure fire at 100 Public Way with 5 over 4.* |

*All Norwich fire apparatus when signing on the air report the total number of firefighters on board and the number of interior qualified firefighters. In the above example there are 5 firefighters on board and 4 are interior qualified.

7.2.6 The following is an example of radio communications for a responding FAST member. Only the first responding member with a radio and C1 and C2 sign on the air and only the first arriving member at the scene and C1 and C2 sign off at the scene.

| Unit | Message |
|---|---|
| Norwich FAST Doe: | Hartford Dispatch — Norwich FAST Doe |
| Hartford Dispatch: | Norwich FAST Doe — Hartford Dispatch |
| Norwich FAST Doe | Responding to a reported medical emergency at 100 Public Way. |

7.2.7 When providing mutual-aid to a department that is not dispatched by Hartford notify Hartford that the unit is responding and that you will be changing radio frequencies to the requesting department and then notify the appropriate dispatch that the unit is responding.

7.2.8 Mobile and Portable Radios

7.2.8.1 Engine 1, Engine 2 and Ladder 1 have mobile radios that operate in the VHF and UHF bands. Engine 3, Tanker 1 and Forestry 1 have radios that operate in the VHF band. Public works operates in the VHF band. Norwich and Vermont State Police operate in the UHF band.

7.2.8.2 While responding to an incident or at an incident all mobile and portable radios, with the exception of command staff mobiles and portables, shall be kept on the frequency assigned to the member's or units function and shall not be in scan mode.

7.2.8.3 The following tables show the channel assignments on mobile and portable radios. TACs 1-8 are normally assigned by Hanover Dispatch. TAC 9 is for Norwich and Hartford and may be used by Norwich after notifying Hartford Dispatch. TAC 10 and 11 are normally

assigned by Lebanon Dispatch.

7.2.8.4 Mobile Radios

7.2.8.4.1 VHF

| Channel | Use | Channel | Use |
|---|---|---|---|
| 1 | Hartford Dispatch | 18 | Claremont Dispatch |
| 2 | TAC 9 (Norwich FG) | 19 | Hanover Repeater |
| 3 | Hanover Dispatch | 20 | TAC 4 |
| 4 | TAC 1 | 21 | TAC 5 |
| 5 | TAC 2 | 22 | TAC 6 |
| 6 | TAC 3 | 23 | TAC 7 |
| 7 | Lebanon Dispatch | 24 | TAC 8 |
| 8 | TAC 10 | 25 | TAC 11 |
| 9 | Sharon Fire | 26 | Vermont Forest and Parks |
| 10 | VCALL | 27 | HEAR 1 |
| 11 | VTAC1 | 28 | HEAR 2 |
| 12 | VTAC2 | 29 | Weather |
| 13 | VTAC3 | 30 | NH VCALL[1] |
| 14 | VTAC4 | 31 | NH VTAC1 |
| 15 | Norwich DPW | 32 | NH VTAC2 |
| 16 | Woodstock Dispatch | 33 | NH VTAC3 |
| 17 | Windsor Dispatch | 34 | NH VTAC4 |

7.2.8.4.2 UHF

| Channel | Use | Channel | Use |
|---|---|---|---|
| 1 | Hartford Dispatch | 15 | Springfield PD |
| 2 | VSP Statewide 2 | 16 | Ludlow PD |
| 3 | Bethel VSP | 17 | St. Albans VSP |
| 4 | Rockingham VSP | 18 | Derby VSP |
| 5 | Bradford VSP | 19 | Shaftsbury VSP |
| 6 | St. Johnsbury VSP | 20 | Middlebury VSP |
| 7 | Rutland VSP | 21 | Brattleboro VSP |
| 8 | Williston VSP | 22 | UCALL |
| 9 | Middlesex VSP | 23 | UTAC1 |
| 10 | Windsor County Sheriff | 24 | UTAC2 |
| 11 | Orange County Sheriff | 25 | UTAC3 |
| 12 | Rutland County Sheriff | 26 | UTAC4 |
| 13 | Woodstock PD | | |
| 14 | Windsor PD | | |

[1] New Hampshire uses a different CTCSS (Private Line) than Vermont and the Upper Valley Regional Emergency Services Association.

### 7.2.8.5 Portable Radios

#### 7.2.8.5.1 HT 750 – 16 Channel

| Channel | Use | Channel | Use |
|---|---|---|---|
| 1 | Hartford Dispatch | 9 | Sharon Fire |
| 2 | TAC 9 | 10 | VCALL |
| 3 | Hanover Dispatch | 11 | VTAC 1 |
| 4 | TAC 1 | 12 | VTAC 2 |
| 5 | TAC 2 | 13 | VTAC 3 |
| 6 | TAC 3 | 14 | VTAC 4 |
| 7 | Lebanon Dispatch | 15 | Norwich DPW |
| 8 | TAC 10 | 16 | Weather |

#### 7.2.8.5.2 HT 1250 - 128 Channel[2]

| Zone 1 | | Zone 2 | |
|---|---|---|---|
| **Channel** | **Use** | **Channel** | **Use** |
| 1 | Hartford Dispatch | 1 | Hartford Dispatch |
| 2 | TAC 9 | 2 | Woodstock Dispatch |
| 3 | Hanover Dispatch | 3 | Windsor Dispatch |
| 4 | TAC 1 | 4 | Claremont Dispatch |
| 5 | TAC 2 | 5 | Hanover Repeater |
| 6 | TAC 3 | 6 | TAC 4 |
| 7 | Lebanon Dispatch | 7 | TAC 5 |
| 8 | TAC 10 | 8 | TAC 6 |
| 9 | Sharon Fire | 9 | TAC 7 |
| 10 | VCALL | 10 | TAC 8 |
| 11 | VTAC 1 | 11 | TAC 11 |
| 12 | VTAC 2 | 12 | Vermont Forest and Parks |
| 13 | VTAC 3 | 13 | HEAR 1 |
| 14 | VTAC4 | 14 | HEAR 2 |
| 15 | Norwich DPW | 15 | FIRE FAST Page |
| 16 | Weather | 16 | DHART LZ |
| | | | |
| **Zone 3** | | | |
| 1 | Hartford Dispatch | | |
| 2 | NH VCALL[3] | | |
| 3 | NH VTAC 1 | | |
| 4 | NH VTAC 2 | | |
| 5 | NH VTAC 3 | | |
| 6 | NH VTAC 4 | | |

[2] Engines 1 and 2 have a mobile repeater for communicating with Hartford Dispatch from a portable. Command staff HT 1250 portables has mobile repeater control in Zone 1 Channel 2 and weather is in Zone 2 Channel 16 and DHART LZ is in Zone 3 Channel 7.

[3] New Hampshire uses a different CTCSS (Private Line) than Vermont and the Upper Valley Regional Emergency Services Association.

### 7.3 Assumption of Command

7.3.1 Command shall be established at all incidents.

7.3.2 The first arriving firefighting personnel or ranking member of the first arriving fire equipment shall assume command. Command shall be formally established by transmitting a brief initial report containing the following information to the Dispatch Center:

7.3.2.1 Identity of the unit transmitting the report.

7.3.2.2 Actual location of the incident.

7.3.2.3 Brief description of the incident and report of conditions.

7.3.2.4 Designation of the individual assuming command

7.3.2.5 Incident name.

7.3.2.6 Location of Command.

Example:

| Unit | Message |
|---|---|
| Norwich Engine 1: | Hartford Dispatch — Norwich Engine 1 |
| Hartford Dispatch: | Norwich Engine 1 — Hartford Dispatch |
| Norwich Engine 2: | Norwich Engine 1 is at 100 Public Way, fire showing from Floor 1 Side A of a two-story frame dwelling, 30 x 40; Firefighter Good is Public Way Command at Engine 1. |
| Hartford Dispatch: | Norwich Engine 1 is at 100 Public Way, fire showing from Floor 1 Side A of a two-story frame dwelling, 30 x 40; Firefighter Good is Public Way Command at Engine 1. |
| Command: | Affirmative. |

### 7.4 Selection of Command Mode

7.4.1 It is preferable for Command to be from a fixed position, particularly when an incident is complex or rapidly escalating.

7.4.1.1 Exception: Command activity may be conducted simultaneously with tactical operations of the first arriving company. The first arriving officer shall take command and shall announce it.

### 7.5 Responsibilities of the Incident Commander

7.5.1 The Incident Commander (IC) at any fire incident shall be responsible for the following:

7.5.1.1 Assessment of Incident Priorities. Incident priorities provide a framework for command decision-making. Tactical activity may address more than one incident priority simultaneously.

7.5.1.1.1 Life Safety (first priority)

7.5.1.1.2 Incident Stabilization (second priority)

7.5.1.1.3 Property and Environmental Conservation (third priority)

7.5.1.2 Perform Size-Up. The IC must perform an initial assessment of the situation, incident potential and resource status. This assessment must address the following three questions:

7.5.1.2.1 What have I got? (situation)

7.5.1.2.2 Where is it going? (potential)

7.5.1.2.3 What do I need to control it? (resources)

7.5.1.3 Size-up is not static and must be continued throughout the duration of the incident.

7.5.1.4 Select the Strategic Mode. A critical decision having an impact on the safety of personnel and the effectiveness of tactical operations is the selection of strategic mode. Operations may be conducted in either an Offensive or Defensive mode. This decision is based on the answers to the following two questions:

7.5.1.4.1 Is it safe to conduct offensive/defensive operations?

7.5.1.4.2 Is resource capability (present and projected) adequate for offensive operations to control the incident?

7.5.1.4.3 An offensive operation's primary objective is fire extinguishment. A defensive operation's prime objective is fire containment. The mode may change during an incident.

7.5.1.5 Define Strategic Goals. Strategic goals define the overall plan that will be used to control the incident. Strategic goals are broad in nature and are achieved by the completion of tactical objectives. Strategic goals are generally focused in the following areas:

7.5.1.5.1 Protection or removal of exposed persons.

7.5.1.5.2 Confinement and extinguishment of the fire or control of the hazard.

7.5.1.5.3 Minimize loss to involved or exposed property and the environment.

7.5.1.6 Establish Tactical Objectives. Tactical objectives are the specific operations that must be accomplished to achieve strategic goals. Tactical objectives must be both specific and measurable. Tactical objectives should define:

7.5.1.6.1 Assignment of resources.

7.5.1.6.2 Nature of the activity.

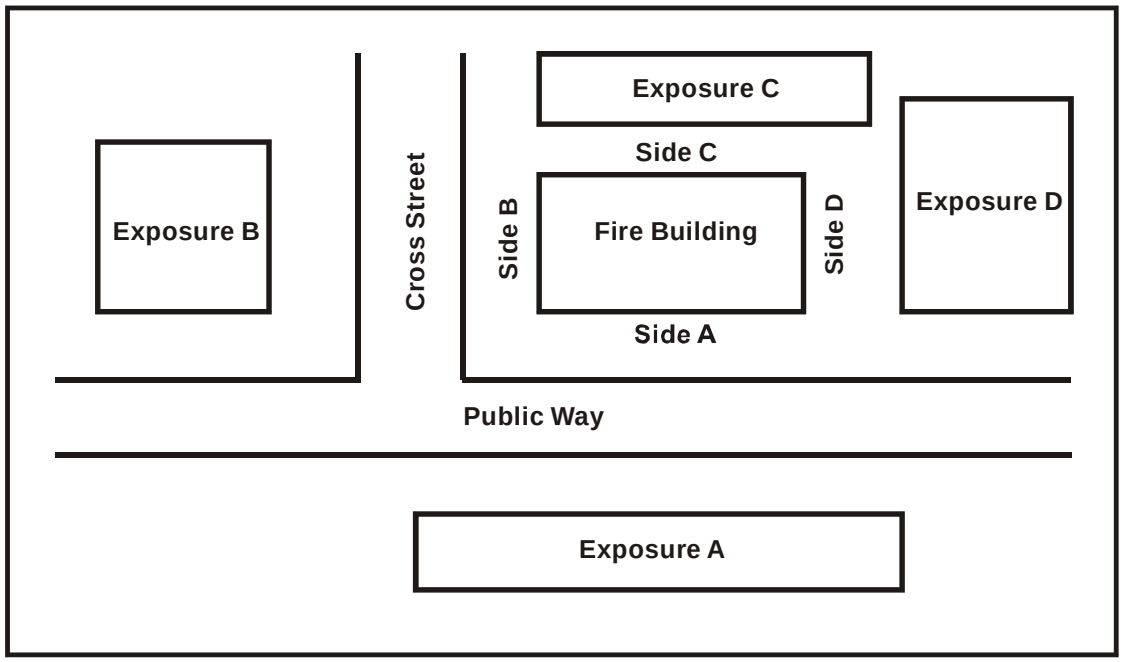
7.5.1.6.3 Location in which the activity must be performed.

7.5.1.6.4 If the action must be performed in sequence or coordinated with any other actions.

7.5.1.7 Implement the Action Plan. Implementation of the incident action plan requires that the IC establish an appropriate organizational structure to manage the required resources and communicate the tactical objectives. The incident action plan may be communicated by Standard Operating Procedures, assigning tactical objectives or by assigning task activity.

## 7.6 Standard Geographic Designation System

7.6.1 Each exterior side of a structure shall be given a number designation. The side of the structure facing the street (address side) shall be designated Side A (Alpha). The remaining sides shall be designated B (Bravo), C (Charlie) and D (Delta) in a clockwise manner. Some mutual-aid departments use a numeric designation for sides and exposures. Side A is designated Side 1, Side B is Side 2, etc. Exposures shall be designated in a like manner as shown in the following figure:




7.6.2 The interior of a structure shall be designated by floor (1, 2, 3, 4, etc.). The basement, attic and roof shall be designated by name.

**7.7 ICS Organizational Hierarchy**

7.7.1 Incident Commander (IC): The individual responsible for the management of all incident operations.

7.7.2 Officer: A member of the Command Staff; i.e., Information Officer, Safety Officer, or Liaison Officer. Command Staff report directly to the IC.

7.7.3 Section Chief: A member of the General Staff; i.e., Operations Section Chief, Planning Section Chief, Logistics Section Chief, or Finance/ Administration Section Chief.

7.7.4 Director: An individual responsible for command of a Branch; i.e., Suppression Branch Director, Medical Branch Director, or Haz-Mat Branch Director.

7.7.5 Supervisor: An individual responsible for command of a Division or Group.

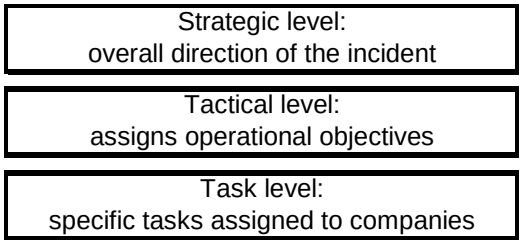
7.7.6 Unit Leader: An individual responsible for managing a particular activity in the Planning, Logistics, or Finance/Administration Sections; i.e., Rehab Unit Leader or Supply Unit Leader.

7.7.7 Single Resource: An individual, a piece of equipment and its personnel, or a crew or team of individuals with an identified supervisor that can be used on an incident.

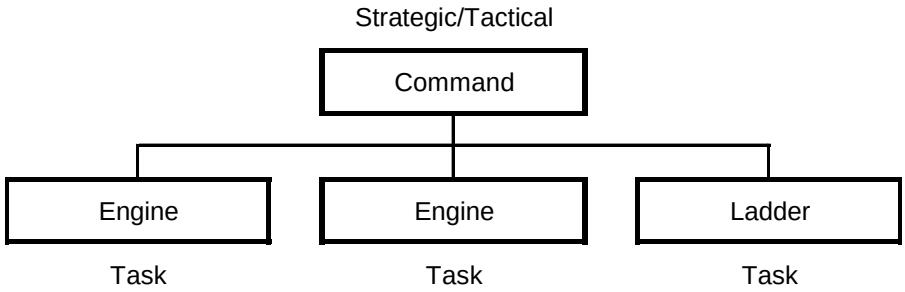
**7.8 ICS Organizational Structure for Initial Operations**

7.8.1 The ICS shall be used to maintain an effective span of control (3-7 individuals reporting directly) and workload for all supervisory personnel.

7.8.2 The basic organization of Command includes the following three levels:




7.8.3 The basic structure for a "routine" incident, involving a small number of companies, requires only two levels of the Command structure. The role of Command combines the strategic and tactical levels. Companies report directly to Command and operate at the task levels shown in the following figure:




7.8.4 More complex incidents require the establishment of Divisions and Groups.

7.8.5 A safety officer should be appointed for complex incidents, working fires and multiple alarms as soon as adequate personnel are available. The safety officer should report to Command and have responsibility for maintaining safe conditions for firefighting personnel.

**7.9 Divisions and Groups**

7.9.1 Divisions represent geographic operations.

7.9.2 Groups represent functional operations.

7.9.3 When multiple resources are assigned to the same function incident-wide (such as ventilation or search and rescue), a Group shall be established to provide coordination and control of tactical operations.

7.9.4 When multiple resources are assigned to perform tactical functions in a specific geographic area (such as on a specified floor or side of a structure), a Division shall be established to provide coordination and control of tactical operations.

**7.10 Designation of Divisions and Groups**

7.10.1 When Division boundaries are established on the exterior of a structure or in non-structural incidents (such as a wildland fire), an alpha designation (A, B, C, D.) shall be used. In addition to establishing the Division designation, specific boundaries must be defined. This is particularly important in non-structural incidents.

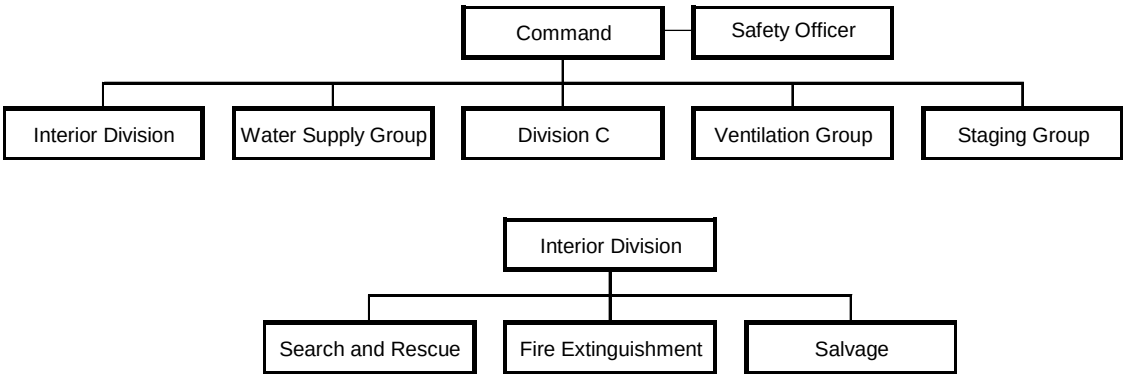
7.10.2 When Division boundaries are defined by level in a structural incident, a number or descriptive designation shall be used (basement, 1, 2, 3, roof). If a Division is given responsibility for the entire structure, it shall be designated as the Interior Division.

7.10.3 In radio communications with a Division the descriptive designation shall precede

"Division" in radio communications (Interior Division, etc.). If a descriptive designation is not given the alpha or numeric designation shall be used Division B from Command or Exposure C from Command).

7.10.4 Groups shall be designated by function (Ventilation, Water Supply, etc.). In radio communications with a Group, the function shall serve as the designation (Ventilation from Command or Water Supply from Command).

7.10.5 The following is an example of the Command structure at a structural incident with an exposure at the rear of the fire building:




7.10.6 Major functional commanders will wear vests with identification of their Command responsibility for any major incident. These functional areas include Command, Safety, Operations, Rehab, Staging, Accountability, Water Supply, EMS, Triage, Treatment and Transport. Command vests are carried on Engine 1 and a limited set on Engine 2.

**7.11 Staging**

7.11.1 When the IC has not defined an assignment for on-scene or responding resources, Staging shall be established.

7.11.2 When an incident is escalating or has not yet been stabilized, sufficient resources to meet potential incident development should be available in Staging until the incident has been stabilized.

7.11.3 The IC shall establish Staging by defining its location and communicating this information to the Dispatch Center. The Dispatcher shall inform all responding resources of the location of Staging.

7.11.4 Fire apparatus that has not received an assignment shall report to the Staging area and notify the Staging Officer. If a Staging Officer has not been assigned, the first arriving fire apparatus shall notify IC of their arrival.

7.11.5 Resources in Staging shall retain integrity (remain with their company) and be available for immediate assignment and deployment.

7.11.6 The Staging Officer shall keep the IC advised of resource availability in Staging whenever resource status changes.

7.11.7 The IC shall request on-scene resources through the Staging Officer and shall specify where and to whom those resources shall report.

## 7.12 ICS Organization for Larger Incidents

7.12.1 ICS organizational structure should be based on the management needs of the incident and should be developed on a proactive basis. Incident resource and management needs must be projected adequately ahead to allow for the reflex time of responding resources.

7.12.2 The IC and other resource personnel should anticipate span-of-control problems. Subordinate management positions should be staffed to maintain an acceptable span of control and workload. This may necessitate requesting additional command officers to fill these overhead positions.

7.12.3 Whenever Operations, Planning, Logistical, or Finance functional responsibilities become a significant workload for the IC, the appropriate sections should be staffed. This will prevent over-extension of the IC's span of control.

7.12.4 Consideration shall be given to establishing a unified command in the following circumstances:

7.12.4.1 A multi-jurisdictional and/or multi-agency event.

7.12.4.2 Responders represent differing legal authorities and functional areas of responsibilities.

## 7.13 Transfer of Command

7.13.1 Command shall be transferred from the initial IC to the first arriving officer on a face-to-face basis whenever possible to facilitate effective communication and feedback. If face-to-face communication is not possible, passing of command by radio may be conducted once.

7.13.2 Transfer of command to the Chief or Deputy Chief is discretionary on the part of the Chief Officer. When a Chief Officer allows a lower ranking Officer to retain command, this does not remove the responsibility for the incident from the higher-ranking individual.

7.13.3 Transfer of command shall include communication of the following information:

7.13.3.1 The status of the current situation.

7.13.3.2 Resources committed to the incident and responding, as well as the present incident organizational structure.

7.13.3.3 Assessment of the current effect of tactical operations.

7.13.4 Following transfer of command, the IC may return the previous IC to his or her Company (if a Company Commander) or specify assignment to a subordinate management position within the ICS organizational structure.

# 8. Response to Alarms

## 8.1 The Chain of Command

8.1.1 The chain of command shall be, in order, the Fire Chief, Deputy Fire Chief, Assistant Fire Chief, Captain and Lieutenant and then Firefighter by seniority. During emergency incidents, the senior firefighter with the first arriving company shall be the incident commander until command is transferred to the first arriving officer.

8.1.2 Response to the Alarm

8.1.3 When an alarm is dispatched, all firefighting personnel and firefighting/EMS personnel, with the exception of the Chief and Deputy Chief, shall report to the station and respond with apparatus.

8.1.4 If at all possible, Engine 1, or the first responding engine, should respond with a driver and 4 firefighters.

8.1.5 If at all possible the first responding engine to an incident involving a smoke or odor investigation, CO alarm, structure fire or similar response should have a minimum of 4 interior qualified firefighters on board.

8.1.6 On mutual-aid responses a responding engine should have 4 interior qualified firefighters and responding ladder should have 3 interior qualified firefighters.

8.1.7 Apparatus should respond in the following order. This may be modified by a chief officer.

| **Structure Fire Chimney Fire** | | **CO Alarm** | **Vehicle Fire - No Exposure** | **Vehicle Accident** | **Brush Fire** |
|---|---|---|---|---|---|
| **Hydrant** | **Rural** | | | | |
| Engine 1<br>Engine 2<br>Ladder 1<br>Engine 3 | Engine 1<br>Tanker 1<br>Engine 2<br>Ladder 1*<br>Engine 3 | Engine 1<br>Engine 3 | Engine 1<br>Tanker 1<br>Engine 3 | Engine 1<br>Engine 3 | Forestry 1<br>Tanker 1<br>Engine 3<br>Engine 1<br>Engine 2 |

Note:
* Ladder 1 does not respond to areas on unpaved roads where roads are narrow and access difficult except on special call.

8.1.8 When responding to an alarm, all units will advise dispatch how many firefighters are on-board and how may are interior qualified (5 over 4) and the first arriving unit shall sign off with a report and establish command. All other units shall sign off at the scene and stand by for orders. Responding fire department apparatus shall not return until ordered by Incident Command.

8.1.9 Responding engine companies shall leave the front of the building accessible for aerial ladder equipment. In the case of a large building on a corner or driveway or parking lot access, engine companies shall be positioned so that aerial ladder equipment has access to all accessible sides of the building.

## 8.2 Fire Department Response Assignments

8.2.1 The Norwich Fire Department Response Assignments are contained in the run cards. They show the first and multiple alarm response to fires in Norwich. The zones are shown on a map in the fire station. In addition to the units shown on the response assignments, the FAST Squad responds to all First Alarms and an EMS transport unit is dispatched for multiple alarms.

## 8.3 Hazardous Materials

8.3.1 The Town of Norwich has adopted a plan for managing hazardous material incidents. It is part of the Emergency Management Plan. This plan shall be used for dealing with hazardous material incidents. Copies are kept in Engine 1 and Engine 2.

8.3.2 Firefighter qualifications include two levels of first responder training for hazardous materials incidents. They are: awareness level, and operations level.

8.3.3 Firefighting personnel qualified at the awareness level are trained to do the following:

8.3.3.1 Suspect or recognize the presence of a hazardous material.

8.3.3.2 Protect themselves.

8.3.3.3 Call for appropriate assistance.

8.3.3.4 Secure the area.

8.3.4 These steps are often referred to as "look and report."

8.3.5 Firefighting personnel qualified at the operations level are trained to do the following:

8.3.5.1 Suspect or recognize the presence of a hazardous material.

8.3.5.2 Protect themselves.

8.3.5.3 Call for appropriate assistance.

8.3.5.4 Secure the area.

8.3.5.5 Confine the release in a defensive fashion from a safe distance.

8.3.5.5.1 Step 5 is often referred to as "dam, ditch and dike." Norwich firefighting personnel qualified at the operations level and with the proper protective equipment may “dam, dike and ditch”.

8.3.6 Firefighters qualified at the operations level with advanced level training in the hazards of gasoline and propane may perform offensive operations consistent with their training if there is minimal risk.

8.3.6.1 Firefighters trained to the operations level, who are also trained in the hazards of propane, may perform offensive operations consistent with their training if there is minimal risk.

8.3.6.2 Firefighters trained to the operations level, who are also trained in the hazards of gasoline, may perform offensive operations consistent with their training if there is minimal risk.

8.3.7 The minimum training for responding to a hazardous materials incident is operations level. All firefighters not operations level qualified shall stage at the station and shall not be assigned duties that are restricted to operations level training.

8.3.8 Levels of Response

8.3.8.1 Level 1

8.3.8.1.1 It can be controlled by local emergency services

8.3.8.1.2 It does not require evacuation outside of the structure or facility. It is confined to the facility involved

8.3.8.2 Level 2

8.3.8.2.1 Decontamination Trailer, Mutual-aid or a Vermont Emergency Management Hazardous Materials Team and/or other regional resources beyond local capabilities are needed.

8.3.8.2.2 Limited evacuation of neighboring residents or facilities is required (no shelters established, civilians can remain nearby for short duration).

8.3.8.2.3 It is not confined to the facility, but remains within a confined geographic area (evacuation can be accomplished without vehicles).

8.3.8.2.4 Potential threat to life, health, or environment exists.

8.3.8.3 Level 3

8.3.8.3.1 Mutual aid from outside the region and state and/or federal resources are needed.

8.3.8.3.2 Evacuation distances of 1/2 mile or more are required.

8.3.8.3.3 It is not confined or has moved past its confined geographic area.

8.3.8.3.4 Actual or perceived threat to life, health and environment exists.

8.3.9 Response Functions

8.3.9.1 First Responders Emergency Action Checklist

8.3.9.2 Most emergency incidents have the potential to involve hazardous materials. The first responder at the scene must immediately assess this potential; further action shall be in accordance with these procedures.

8.3.9.2.1 First Responder Emergency Action Checklist

8.3.9.2.1.1 If the scene is on a public highway, immediately take precautions to warn other vehicles so that subsequent collisions will not occur. Establish traffic control.

8.3.9.2.1.2 Assess the situation for the presence of hazardous materials, downed wires, spilled fuels, unstable conditions. Record placard numbers and other information to complete assessment. Maintain a safe distance from hazards. Stay upwind and upgrade.

8.3.9.2.1.3 Use the DOT Emergency Response Guidebook to identify hazardous materials and to identify the hazards of the specific materials involved.

8.3.9.2.1.4 Complete the Hazardous Materials Incident Information Summary form.

8.3.9.3 Notification of Response Agencies

8.3.9.3.1 For a chemical release of a CERCLA hazardous substance or a SARA Extremely Hazardous Substance above the reportable quantity, immediate notification must be provided to the Vermont HAZMAT Hotline. The information contained on the Hazardous Materials Incident Information Summary form should be reported. Under state and federal law, primary responsibility for notifying these agencies belongs to the carrier or facility owning or transporting the material.

8.3.9.3.2 The following is an excerpt from the Vermont ANR Hazardous Waste Management Regulations:

§ 7-105 EMERGENCY AND CORRECTIVE ACTIONS

(2) Reporting

(A) All discharges and/or releases that meet any of the following criteria shall be immediately reported to the Secretary by the person or persons exercising control over such waste by calling the Waste Management Division at (802) 241-3888,

Monday through Friday, 7:45 a.m. to 4:30 p.m. or the Department of Public Safety, Emergency Management Division at (800) 641-5005, 24 hours/day:

(i) A discharge of hazardous waste, or release of hazardous material that exceeds 2 gallons;

(ii) A discharge of hazardous waste, or release of hazardous material that is less than or equal to 2 gallons and poses a potential or actual threat to human health or the environment; or

(iii) A discharge of hazardous waste, or release of hazardous material that equals or exceeds its corresponding reportable quantity under CERCLA as specified under **40 CFR § 302.4**.

**Note:** Under the Federal Water Pollution Control Act, certain spills of "oil" and/or "hazardous substances" are prohibited and must be reported pursuant to the requirements of **40 CFR Part 110** / Discharge of Oil. Certain spills of hazardous substances must also be reported pursuant to CERCLA. In both cases, the National Response Center must be notified at (800) 424-8802. Finally, in addition to federal and state spill reporting, EPCRA requires that spills are also reported to local authorities.

(B) A written report shall be submitted to the Secretary within ten (10) days following any discharge or release subject to subsection (a)(1) of this section. The report should be sent to: The Vermont Department of Environmental Conservation, Waste Management Division, 103 South Main Street, Waterbury, VT 05671-0404. The person responsible for submitting the written report may request that it not be submitted for small discharges and/or releases that were reported pursuant to subsection (a)(2)(A) of this section, and that have been entirely remediated within the ten (10) day period immediately following the discharge and/or release

(3) If the discharge or release occurred during transportation, the transporter shall, in addition to notifying the Secretary:

(A) Notify the National Response Center at (800) 424-8802 or (202) 426-2675, if required by 49 CFR § 171.15; and

(B) Report in writing to the Director, Office of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590, if required by 49 CFR § 171.16; and

(C) A water (bulk shipment) transporter who has discharged hazardous wastes must give the same notice as required by 33 CFR § 153.203 for oil and hazardous substances.

8.3.9.3.2.1 Written report requirements are included in the Plan. The written reports need to be filed as part of the incident report.

8.3.9.4 Direction and Control

8.3.9.4.1 The Incident Commander shall direct and coordinate all response activities. A command post may be established at the scene or at another location as deemed appropriate by the nature of the incident.

8.3.9.5 Incident Commander's Emergency Action Checklist

8.3.9.5.1 Evaluate the release using all available product hazard, monitoring and release quantity information. Define the threat to area residents or others in the area. Establish "Hot Zones", and restricted access areas.

8.3.9.5.2 Identify immediate steps to protect the lives of area residents, other persons traveling

on the highway or railroad, and emergency responders. Establish personal protection protocols as appropriate to the identified hazards.

8.3.9.5.3 Implement the Alerting and Warning provisions of the EOP as appropriate.

8.3.9.5.4 Identify additional resources that may be required. Call for backup forces to wait in nearby staging area.

8.3.9.5.5 Establish the hazard zone. Establish entry and exit checkpoints and decontamination areas.

8.3.9.5.6 Notify local and state authorities of the incident. Includes HAZMAT HOTLINE at (800) 641-5005 and District 3 LEPC.

8.3.9.5.7 Prepare public information statements.

8.3.9.5.8 Coordinate the emergency response activities of emergency rescue, fire and police services.

8.3.9.5.9 Based on the evolving nature of the incident, continuously re-evaluate the need to evacuate residents and others in the area.

8.3.9.5.10 Within the limits imposed by the exposure hazards of the incident and the training levels of the responders, contain spill materials by building dams or dikes. Remove uninvolved materials from threatened areas if feasible. Apply cooling water spray to containers threatened by fire.

**8.4 Fire Operations in a Hydrant District**

8.4.1 Duties of the First Due Engine

8.4.1.1 The first due engine responds directly to the fire scene, performs rescue, if needed, and initial fire attack. All interior firefighters shall don SCBA while responding to a structure fire or other incident that may have IDLH conditions.

8.4.1.2 In the case of a driveway longer than 100 feet and if fire or smoke is showing from the street, the first due engine shall forward lay a line from the street or water supply location to the fire building.

8.4.1.3 If the first due engine lays a line from a hydrant to the fire scene without connecting to the hydrant, leave the Hydrant Bag with 2 hydrant gates, hydrant wrench, spanners and 2½" female by 4" adapter at the hydrant for use by the second due engine or other responding fire apparatus.

8.4.1.4 The proper size up, commitment of apparatus, and hose streams set the stage for the remainder of the fire operations.

8.4.2 Duties of the Second Due Engine

8.4.2.1 The primary duty of the second due engine is water supply to the first due engine. All supply lines laid on the fireground, with the possible exception of the first line, should be fed by pumpers placed on hydrants to supply them.

8.4.2.2 In the hydrant district stand by at the nearest hydrant. Do not block access for the ladder truck.

8.4.2.3 If fire or smoke is showing or the first due engine has laid a line from the street to the fire building, reverse lay a line from the first due engine or line to the nearest hydrant.

8.4.2.4 Dress the hydrant with two hydrant valves, connect the pump to the hydrant 4½” connection using the soft suction and start hydrant water when advised by the first due engine or

command.

8.4.2.5 If there may be a delay in getting hydrant water, connect the supply line to the pump and start tank water when advised by the first due engine or command and change to hydrant supply as soon as possible.

8.4.2.6 If the first due engine has laid a line from a hydrant (without connecting to the hydrant) to the fire building, follow the procedures in the above sections.

**8.5 Fires Involving Sprinkled Buildings**

8.5.1 Non-Residential Sprinklers

8.5.1.1 The duties of the first due engine remain the same as at a fire in a sprinkled building; perform rescue and initial fire attack.

8.5.1.2 If upon arrival, the water motor gong is ringing, dispatch should be advised in the arrival report.

8.5.1.3 The duties of the second due engine at a fire involving a sprinkled property is the supplementing of the water supply to the sprinkler.

8.5.1.4 Unless otherwise ordered, the second due engine should respond and stand by near the fire department connection. If so ordered, or if there is fire or smoke showing, a 4-inch line shall be laid from the fire department connection to the nearest hydrant or water supply and the pumper connected to the hydrant or set up to draft from the water supply. The engine supplying the sprinkler system should not supply water to any other firefighting operation.

8.5.1.5 As soon as the pump is set up and the lines are connected advise Command. When ordered by Command operate the pump and bring the pressure to 150 psi discharge pressure. Decrease or increase pressure on the orders of the Command. Shut down the pumper only on orders of Command.

8.5.1.6 As soon as possible Command or Interior Division should send someone to the sprinkler control valve and ensure the valve is fully open. Shut the sprinkler control valve only after ensuring that the fire is out and then only on the orders of Command.

8.5.1.7 When shutting down the sprinkler system, shut down the supply pumper first, then close the sprinkler control valve and open the 2” drain valve. Leave a firefighter detailed to the sprinkler valve with a portable radio in case the valve needs to be opened. Immediate plugging of open sprinkler heads will lessen the water damage to the property.

8.5.2 Residential Sprinklers

8.5.2.1 Residential sprinklers systems may use on-site storage for supplying the sprinklers. Storage is normally provided to supply two operating sprinkler heads for 10 or 20 minutes.

8.5.2.2 If, upon arrival of the first due engine there is any sign of fire or the sprinkler alarm is sounding the first due engine will immediately connect to the fire department connection, if there is one, using 2½ inch hose and supply the sprinkler system using a discharge pressure of 100 psi. The engine supplying the sprinkler system may supply attack lines.

8.5.2.3 Other operations will be as provided for in a hydrant or rural district.

**8.6 Rural Areas**

8.6.1 The officer in charge must decide which options are available, the size of the building involved and the extent of the fire. In this case, the responsibilities of the first due engine are essentially the same as the first due engine in a hydrant district.

8.6.2 Proper placement of apparatus at rural fires is as critical as in the hydrant district. If the fire is at the end of a driveway longer than 100' or more than 100' from the anticipated location of water supply, and if there is any smoke or fire showing upon approach, then the first due engine shall lay a 4" line into the fire property. When adequate water supply is available the tank of the first due engine should be refilled to provide a back-up supply of water.

8.6.3 Perform rescue, if needed, and initial fire attack.

8.6.4 The next engine in will set up and relay water to the first due engine, keeping in mind where the water source is and whether additional tankers and pumpers are needed. The first arriving tanker not committed to supplying the first due engine should set up the folding-tank for the second due engine, dump its water and begin water supply operations. The second due engine should draft from the folding tank using the low-level suction. For a major fire or if needed to maintain fire flows or to efficiently use the tanker shuttle as soon as an additional tanker with a second folding-tank arrives it should be set up adjacent to the first folding-tank and the low-level jet suction set in the second folding-tank and the 1½" jet suction connected to a discharge port on the second due engine. This will allow water to be dumped in either folding-tank and water to be transferred from the second folding tank to the first as needed by adjusting the flow through the line to the jet suction.

8.6.5 Water supply operations to maintain a constant water supply based on the availability of a dry hydrant, nearby pond or other surface supply may include any of the following or a combination of the following.

8.6.5.1 Additional tankers. Approximately one 1,000 tanker is needed for each 50 gpm of fire flow. This figure is based on a travel distance of 3.5 miles from the fill site to the dump site.

8.6.5.2 Surface supplies and portable pumps.. When using a portable pump the water should be discharged to a folding-tank to maximize the efficiency of the pump. The second due engine, or other engine, can draft from the folding-tank and supply the first due engine, or pump in relay to the first due engine, or other apparatus supplying fire streams. The portable pump on Engine 2 has an approximate capacity of 500 gpm and the portable pump on Tanker 1 - 350 gpm.

8.6.5.3 Large Diameter Hose (LDH). Water can be pumped long distances using 4 inch LDH. At 500 gpm the friction loss is ~5 psi per 100 ft. Using a pump discharge pressure of 150 psi and a residual pressure of 20 psi at the next pumper, water can be pumped 2,600 feet plus or minus an adjustment of 1 psi per 2 feet of elevation differences. As a general practice, in a long relay, pumpers should be placed approximately every 2,000 feet for 500 gpm and a maximum of 900 feet for 1000 gpm.

8.6.5.4 In the case of a major fire in a rural area that will require a long term water supply of 500 gpm the following details a typical operation.

8.6.5.4.1 Engine 1 functions as the attack engine and proceeds to the fire location.

8.6.5.4.2 Engine 2 functions as the water supply engine and feeds Engine 1 through 4" hose.

8.6.5.4.3 Tanker 1 drops its folding tank for Engine 2, dumps its water, and proceeds to the fill site.

8.6.5.4.4 Engine 3 or a mutual-aid pumper proceeds to the fill site, if not a pressure hydrant, and sets up to fill tankers. Normally two fill lines will be set up to allow one tanker to be connected as another is being filled.

8.6.5.4.5 Depending on the location of the incident it may be necessary for Engine 2 to set up a 4" supply line from the pony suction for a nurse operation to receive water from incoming

mutual-aid pumpers, which typically carry 1,000 gallons of water, until the tanker shuttle is fully operational or a local surface source is established.

8.6.5.4.6 The tanker shuttle should continue until a local surface source is established or the fire is extinguished.

8.6.5.4.7 Until a reliable water supply is obtained, the first due engine should make every attempt to conserve water. After rescue, the next priority is the protection of exposures.

**8.7 Mutual Aid**

8.7.1 Only apparatus dispatched by Hartford Dispatch will respond.

8.7.2 Members shall respond to the Norwich station and not the requesting community.

8.7.3 The engine should respond with a minimum of 4 interior qualified firefighters, the ladder with a minimum of three firefighters, two interior qualified, and the tanker with a minimum of two firefighters unless otherwise directed by a chief officer.

8.7.4 When apparatus is responding to the scene interior qualified members will don SCBA in route.

8.7.5 Apparatus should respond to requests for mutual aid assistance in the following order.

| Pumper | Tanker | Aerial | Forestry |
|---|---|---|---|
| Engine 1*<br>Engine 2 | Tanker 1 | Ladder 1 | Forestry 1 |

* If at the time of response it is known that the pumper is responding to the scene and will be involved in water supply Engine 2, which has a 500 gpm portable pump, should respond.

**8.8 Evacuation Signals**

4.4.8. The emergency signal for all personnel to evacuate shall be a radio broadcast followed by three 5–second blasts of apparatus air-horns, or in the absence of air-horns other audible warning devices, followed by a second radio broadcast and activation of the SEMS evacuation signal.

# 9. Pumper Operations

## 9.1 Training

9.1.1 Personnel shall not operate pumps or drive apparatus until they have been trained. Training shall include all aspects of pump operations and be done in accordance with these SOPs and *NFPA 1002: Fire Department Vehicle Driver/Operator Professional Qualifications*.

## 9.2 Fireground Operations

9.2.1 The primary responsibility of the pump operator is to provide an uninterrupted supply of water to the attack lines.

9.2.2 The pump operator of the first arriving engine is responsible for chocking the wheels, breaking and connecting the 4" hose to the pump and providing initial fireground accountability.

9.2.3 Attack lines shall not be charged until the attack crew signals it is ready for water. This signal can be by radio, verbal, hand signal, or through a prearranged order. The pump operator shall be responsible for seeing that there are no kinks in the hose line outside of the building. Once a line has been charged, verify that water has been received at the nozzle.

9.2.4 Pump pressures should be increased and decreased slowly to prevent water hammer.

9.2.5 For relay pumping, a residual pressure of 40 psi is desirable. When pumping from a hydrant, 20 psi is desirable as a minimum residual pressure. Pump operators should realize that when residual pressure is less than 20 psi, it is likely that no additional lines may be pumped.

9.2.6 The following are the typical flows from the pre-connects with Vindicator nozzles on Engines 1 and 2.

- 1¾" hose – 150 gpm
- 2" hose – 250 gpm
- 2½" hose – 350 gpm

9.2.7 For Class A fires, unless otherwise directed by Command, Class A foam proportioned at 0.5% shall be used for fire attack and 0.1-0.2% for overhaul.

9.2.8 For Class B fires, unless otherwise directed by Command, Class B foam will be used. The normal proportioning rate is 1.0% for hydrocarbon fuels without significant amounts of polar solvents and 3.0% for polar solvents.

9.2.9 Whenever an attack line has been stretched into a building the pump operator shall begin the necessary tasks to ensure an uninterrupted flow of water. He/she shall be guided by the SOPs concerning the responsibilities of the first and second due engine. In the absence of an officer, the pump operator has the authority to direct incoming apparatus to the best means of establishing a water supply.

9.2.10 Hydrant area: Direct the second due engine to perform either a forward or reverse lay.

9.2.11 Rural area: In most cases, the second due unit shall pump off its water through 4" hose to the first due engine.

9.2.12 The first tanker should set up the folding-tank for the second due engine, dump its water and begin water supply operations. Subsequent tankers shall continue the water supply operation.

9.2.13 The pump operators shall be justified leaving the pump panel only when their actions provide for a greater level of safety for the attack crew. There is no activity which warrants jeopardizing their safety. Before leaving the pump panel the attack lines must be charged. Examples of such activities would be:

- Quick outside venting of windows or doors,
- A survey of fire conditions in the rear of the building,
- Assisting with ladder raises for rescue and/or to establish a second way out of the building.

9.2.14 Supply lines shall be laid on the hydrant or source side of the street wherever possible and along the side of driveways to allow access for responding fire equipment. If the first due engine lays its own supply line, the pump operator should make the line ready to receive water as soon as possible. This can be done by:

- Connecting the line to the pump; or
- Clamping the line at least twenty feet behind the rear of the truck.

9.2.15 Once this has been done, water supply shall be informed that the first due engine is ready for water.

9.2.16 The hydrant person or pump operator supplying water shall charge the line when notified.

9.2.17 This can be done by radio, visual or verbal signal.

9.2.18 The pump operator shall inform the Incident Commander when 25% of tank water supply is remaining.

9.2.19 The pump operator shall supervise the connection of all lines to the engine to ensure that it is done properly.

9.2.20 Rubber mallets should only be used when necessary and not as a matter of routine.

9.2.21 Pumps will be kept wet. From November 1 through April 1 the under-the-pump heat retention pans shall be installed on Engine 1, Engine 2 and Tanker 1.

9.2.22 . During below freezing temperatures the pump shall be engaged and water circulated through the water tank.

9.2.23 Take advantage of the equipment on apparatus already in the fire area instead of bringing in more units. Connect extra lines to pumpers, which already have a good water supply.

9.2.24 The pump operator shall check the apparatus for missing equipment, open doors, etc., before leaving the scene.

9.2.25 Whenever the pump has been used the pump operator shall check the following upon return to quarters;

9.2.25.1 Water tank full

9.2.25.2 Fuel tank (refill if less than ¾ full)

**9.3 Information for Specific Apparatus**

9.3.1 An inventory of the equipment carried on each piece of fire apparatus should be maintained by the apparatus team leader. Equipment should not be moved from its identified location or removed without the permission of the Chief or Deputy Chief. If equipment is damaged and must be taken out of service notify the Chief or Deputy Chief and put a note on the station blackboard and fill out a maintenance sheet explaining the reason the equipment was taken out of service and the action necessary to restore the equipment to service.

9.3.2 The following information is specific to Engines 1, 2, and 3.

9.3.3 Engine 1 is a 2005 Diesel Engine HME Rescue/Pumper with a 1500 gpm pump and

carries 1,000 gallons of water, 35 gallons of Class A foam and 25 gallons of Class B foam, 2,000 of 4" hose, 800' of 2½" hose, 200' of 2" hose, 800' of 1¾" hose, 35' three section extension ladder, 14' roof ladder, 10' attic ladder, folding ladder, 2-14 6" hard suctions, thermal imaging camera, multi-gas meter, generator, lighting equipment, 4-SCBA with 8 extra air bottles, firefighting equipment, vehicle extrication equipment, 2-backboards and EMT supplies and has seating for 5 firefighters.

9.3.3.1 Engine 1 crosslays front to back.

- 200' 1¾" preconnect with Vindicator LA nozzle.
- 200' 1¾" preconnect with Vindicator LA nozzle.
- 400' 1¾" prepack with 15/16" SS nozzle.

9.3.3.2 Engine 1 rear hose loads left to right.

- 200' 2½" preconnect with Vindicator BA nozzle.
- 200' 2" preconnect with Vindicator HA nozzle.
- 1200' 4" LDH
- 800' 4" LDH
- 800' 2½" prepack with 1"/1 1/8"/1¼" stacked tip SS nozzle.

9.3.4 Engine 2 is a 2000 Diesel Engine Freightliner Pumper with a 1500 gpm pump and carries 1,000 gallons of water, 35 gallons of Class A foam and 25 gallons of Class B foam, 2,000 of 4" hose, 800' of 2½" hose, 200' of 2" hose, 800' of 1¾" hose, 35' three section extension ladder, 16' roof ladder, 10' attic ladder, 3-10 6" hard suctions, thermal imaging camera, multi-gas meter, generator, lighting equipment, 4-SCBA with 4 extra air bottles, 500 gpm portable pump and firefighting equipment and has seating for 5 firefighters.

9.3.4.1 Engine 2 crosslays front to back.

- 200' 1¾" preconnect with Vindicator LA nozzle.
- 200' 1¾" preconnect with Vindicator LA nozzle.
- 400' 1¾" prepack with 15/16" SS nozzle.

9.3.4.2 Engine 2 rear hose loads left to right.

- 800' 2½" prepack with 1"/1 1/8"/1¼" stacked tip SS nozzle
- 1200' 4" LDH
- 800' 4" LDH
- 200' 2" preconnect with Vindicator HA nozzle.
- 200' 2½" preconnect with Vindicator BA nozzle.

9.3.5 Engine 3 is a 1989 gasoline-powered four-wheel drive mini-pumper/utility that carries 200 gallons of water. It has a 750-gpm front mount pump rated at 500 gpm with limited firefighting and forestry equipment and seating for 3 firefighters. It has 2-200' 1½" crosslays with combination nozzles, 200' of 2½" hose in the rear hose bed, 1,000' of 1" forestry hose on a reel and 200' of 1" forestry hose on the front bumper. It also carries the Hazardous Materials Overpack Drum, Survivair Salvage Master and Dewatering pump.

9.3.6 Engine 1 and 2 Pump Pressures

9.3.7 Class A foam is used for all structure fires unless otherwise directed by Command. The normal initial proportioning for structure fires is 0.5% and 0.1-0.2% for overhaul. The Vindicator Nozzles produce an expansion ratio of approximately 7 when used at the pressures below. The

standard pump discharge pressure for pre-connects is 150 psi.

| Line | Length (ft) | Nozzle | Discharge Pressure (psi) | Flow (gpm) |
|---|---|---|---|---|
| 1¾ Crosslay Preconnect | 200 | LA Vindicator | 150 | 150 |
| 1¾ Crosslay Prepack 15/16" SS Nozzle | 200 | Solid Stream | 150 | 185 |
| | 300 | | 195 | 185 |
| | 400 | | 240 | 185 |
| 2” Rear Preconnect | 200 | HA Vindicator | 150 | 250 |
| 2½ Rear Preconnect | 200 | BA Vindicator | 140 | 350 |
| 2½ Rear Prepack 1 1/8" Nozzle | 200 | Stacked Solid Stream (1”, 1 1/8, 1 ¼”) | 90 | 200/250/300 |
| | 300 | | 110 | 250 |
| | 400 | | 130 | 250 |

The following flows and pump pressures are for the master stream appliances.

| Tip | Flow | Pump Pressure |
|---|---|---|
| 1⅜" | 500 | 90 |
| 1½" | 600 | 90 |
| 1¾" | 800 | 90 |
| 2” | 1,000 | 90 |
| Fog | 500-1,000 | 110 |

9.3.8 Tanker 1 is a 2002 Diesel Engine Freightliner tanker that carries 2,000 gallons of water, has a 500 gpm pump, 400’ of 4” hose, 200’ of 2½” hose, 400’ of 1¾” hose, 2 SCBA and a 350 gpm portable pump and has seating for 3 firefighters.

9.3.8.1 Tanker 1 crosslays front to back.

- 200’ 1¾” preconnect with combination nozzle.
- 200’ 1¾” preconnect with combination nozzle.

9.3.8.2 Tanker rear hose loads.

- At left 400’ 2½” hose with combination nozzle
- At right 400’ 4” LDH.

9.3.9 Forestry 1 is a 2001 Diesel Engine four-wheel drive Ford F550. It has a forestry skid unit with a high-pressure low volume mounted gasoline powered portable pump, 300 gallons of water, 12 gallons of Class A foam, 1,000’ of 1” forestry hose, 200’ of 1½” hose, 100’ of 2½” hose, 5 gallon back pumps, chain saw and forestry tools. Class A foam should be used for wildland fire fighting with a proportioning range of 0.1 to 0.2%. A higher percentage may be used for exposure protection and establishing a fire line.

**9.4 Foam Use**

9.4.1 Engine 1 and 2 have two types of foam; 35 gallons of Class A foam and 25 gallons of

Class B foam. Additional foam is stored at the fire station.

9.4.2 The foam systems are discharge-side direct-injection with a maximum foam concentrate flow capacity of 5.0 gpm for Engine 1 and 3.3 gpm for Engine 2 with an adjustable proportioning rate from 0.1% to 10.0%. The 1¾" preconnect crosslays and 2" and 2½" rear preconnects are foam capable.

9.4.3 Class A Foam

9.4.3.1 The Class A Foam is Phos-Chek with a proportioning rate of 0.1% to 1.0%. The higher the proportioning rate the stiffer the foam. The Class A preset value is 0.5%

9.4.4 Class B Foam

9.4.4.1 The Class B Foam is National Foam Universal Gold Alcohol-Resistant Aqueous Film Forming Foam (AR-AFFF) 1% x 3%. The proportioning rate is 1.0% or 3.0%. 3% for polar solvents and highly oxygenated gasoline and 1% for hydrocarbons. The Class B preset value is 1%.

9.4.4.2 In addition to the Vindicator nozzles, Engine 1 and Engine 2 have a TFT MX-FOAMJET rear air-aspirating variable expansion ratio attachment for the TFT ThunderFog nozzle with an expansion ration of 10 to 30 and maximum reach of about 40'. As the expansion ratios increase the reach is reduced. Use low expansion for fire fighting and medium expansion for establishing a vapor seal.

9.4.5 Class B Foam Application

9.4.5.1 When applying Class B foam never apply directly to the flammable or combustible liquid. Always use the bounce-off, bank-in or rain-down technique of application.

9.4.5.2 Hydrocarbons (Non-Polar Solvents) are flammable or combustible liquids that float-on and will not mix with water (eg. Gasoline, Diesel, JP4, Heptane, Kerosene). The NFPA recommended application rate for Film Forming Type Foams equals 0.1 gpm (foam solution) per square foot of fire. It is recommended that sufficient foam concentrate be on scene to allow for a minimum of 15 minutes of application before starting firefighting operations.

9.4.5.3 Polar solvents - Flammable liquids that are water miscible or will mix with water (eg. Ketones, Esters, Alcohol, MTBE, Amine). Use proportioning and application rates in following table. It is recommended that sufficient foam concentrate be on scene to allow for a minimum of 15 minutes of application before starting firefighting operations.

| **Product** | **Recommended Proportioning Rate** | **Type II* Application Rates ($gpm/ft^2$)** |
|---|---|---|
| Ethanol | 3% | 0.10 |
| Methanol | 3% | 0.10 |
| Methyl Ethyl Ketone | 3% | 0.12 |
| Methyl Tertiary Butyl Ether | 3% | 0.13 |
| MTBE/Gasoline Blends (up to 30% MTBE) | 3% | 0.15 |
| Ethanol/Gasoline Blends (up to 15.6% Ethanol) | 3% | 0.15 |
| Heptane (hHydrocarbons) | 1% | 0.10 |

* Type II Discharge Outlet – A fixed device that delivers foam onto the burning liquid and partially submerges the foam and produces restricted agitation of the surface. Examples of this type of device are Foam Chambers and Foam Makers. Type III Discharge Outlet – A fixed or portable device that delivers foam in a manner that causes the foam to fall directly onto the surface of the burning liquid in such a way that causes general agitation. Examples of this type of device are Hose Stream Nozzles and Monitors.

# 10. Aerial Operations

10.1.1 Ladder 1 is a 1979 Maxim ladder truck with a 100-foot aerial, ground ladders and salvage equipment..

10.1.2 The following ladders are carried:

| | |
|---|---|
| 16' Roof<br>35' Extension | 22' Roof<br>20' Roof<br>28' Roof |
| | 16' Extension |

10.1.3 In addition there is a pencil ladder carried on the left side.

## 10.2 Aerial Training

10.2.1 Personnel shall not operate or drive aerial apparatus until they have been trained. Training shall include all aspects of aerial operations and be done in accordance with the manufacturer's recommendations, recognized practices and *NFPA 1002: Fire Department Vehicle Driver/Operator Professional Qualifications*.

## 10.3 Aerial Fireground Operations

10.3.1 The primary responsibility of the truck company is rescue, followed closely by forcible entry, ventilation, salvage and other support services.

10.3.2 It is recommended that a crew of three be on the aerial truck before it leaves the station.

10.3.3 The Incident Commander shall notify the aerial truck as to where the apparatus is needed.

10.3.4 If the aerial truck is not needed for ladder work, the driver shall park it safely out of the way of fireground operations but close enough to use the hand tools if needed. The crew shall remain with the truck and await orders.

10.3.5 When the aerial truck is needed for ladder operations, the driver shall position the apparatus in a safe manner away from hazards such as unstable ground, power lines, trees, and other obstructions.

10.3.6 Members assigned to interior operations (i.e., ventilation, entry, search and rescue, and salvage) shall bring necessary tools with them.

## 10.4 Aerial Safety

10.4.1 The parking brake and wheel chocks both in front and behind the rear tires shall be used at all times when the aerial truck is parked, or in use at the fireground. In addition the all-wheel brake shall be used when using the aerial.

10.4.2 The manually operated outrigger jacks shall be used at all times when the aerial ladder is used. Jack pads shall be used at all times.

10.4.3 Safety belts shall be worn at all times by all persons while working on the aerial ladder.

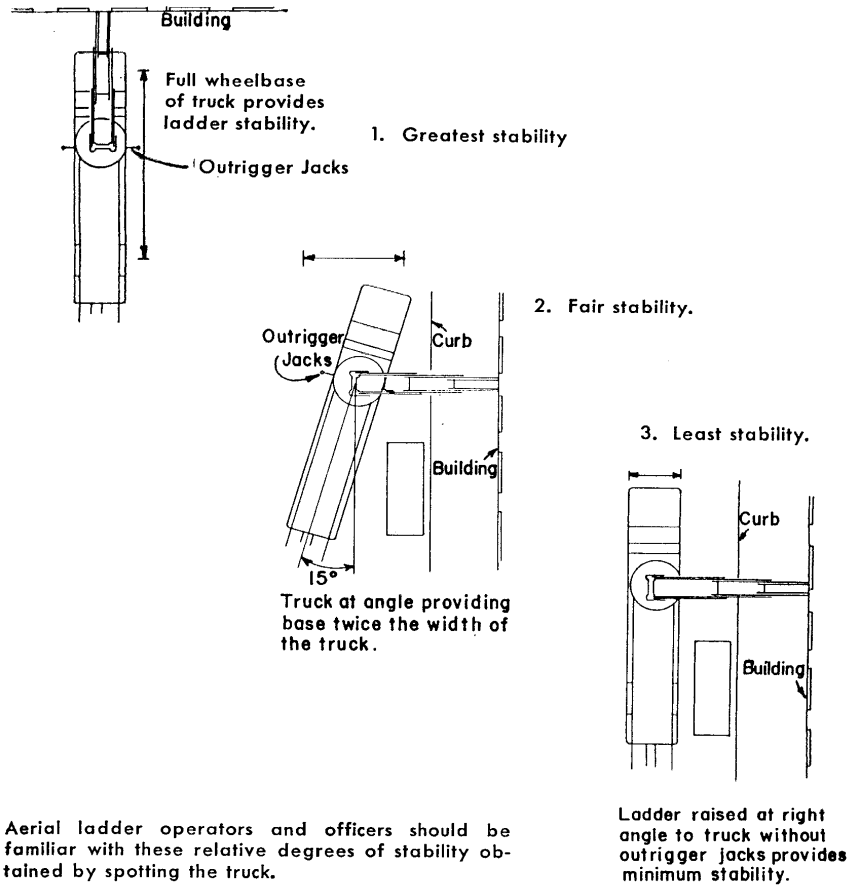
10.4.4 Protective clothing and equipment shall be used whenever there is any possibility of encountering a hazardous condition.

10.4.5 Ladder locks shall be used at all times.

10.4.6 The ladder fly shall not be extended or retracted with any persons on it.

10.4.7 Maximum stability shall be maintained by adhering to recommended loads, angles, and extensions posted on the pedestal control panel, inclinometer and manufacturer's recommendations.

10.4.8 The aerial ladder should not be operated perpendicular (90° angle) to the main axis of the truck. The safest operation is position the aerial directly in line with the truck. A 15° minimum angle with the building should be maintained. This doubles the effective width of the base of the truck. See the following figure:




10.4.9 There shall be an operator at the pedestal controls at all times during ladder operations.

10.4.10 If at all possible, the aerial should only be raised when a spotter is available to watch for obstructions from the ground.

10.4.11 The normal sequence of raising the ladder is:

1. Elevate
2. Rotate
3. Extend

10.4.12 If there is a supporting surface at the fly end, the aerial should be positioned 2" to 6" above the surface. The greater clearance is for low elevation and long extension.

## 10.5 Ladder pipe

10.5.1 Ladder 1 has a pre-piped bed ladder pipe and a ladder pipe that can be mounted on the Fly section of the ladder. The bed ladder pipe has a fog nozzle that adjusts flow (300 to 1,000 gpm) to nozzle pressure. The Ladder Pipe for the Fly section has one 2½" inlet. It has 1¼", 1½" and 1¾" solid stream stacked tips. It is supplied by 100' of 3" hose.

10.5.2 The following are the flows for the fog nozzle mounted on the bed ladder:

| Flow (gpm) | Pressure at Base (psi) |
|---|---|
| 300 | 105 |
| 500 | 110 |
| 750 | 120 |
| 1,000 | 135 |

10.5.3 The following are the flows for the solid stream and fog tips for the ladder pipe mounted on the Fly section:

| Tip Size (in) | Pressure (psi) | Flow (gpm) |
|---|---|---|
| 1¼ | 80 | 400 |
| 1½ | 80 | 600 |
| 1¾ | 80 | 800 |

10.5.4 The following are safety precautions for ladder pipe (nozzle) operation:

10.5.4.1 Normal operation is to use the bed ladder pipe operated from the control pedestal and control lines for operating the fly ladder pipe.

10.5.4.2 The ladder pipe should be operated at right angles to the ladder rungs.

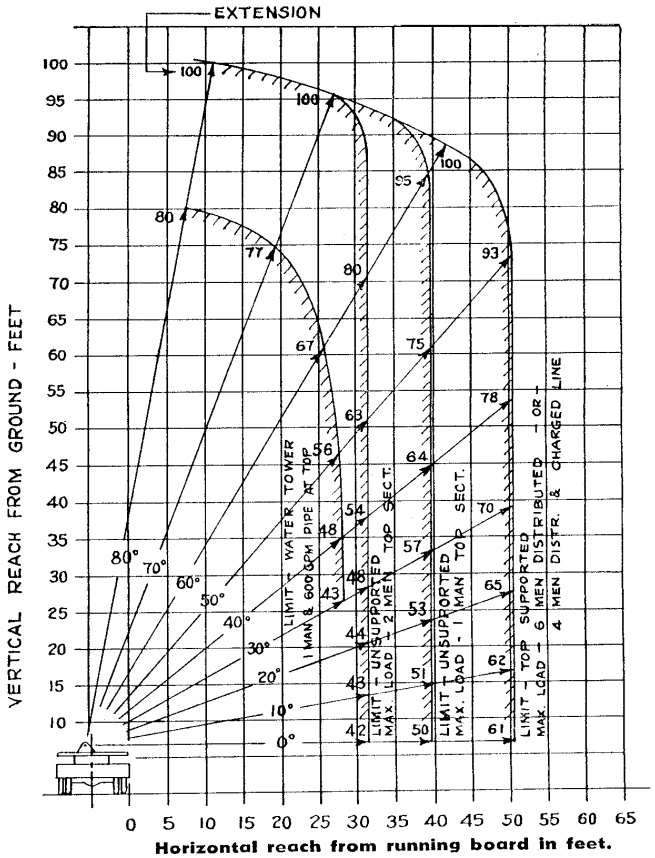
10.5.4.3 Any change in direction sideways should be accomplished by rotating the turntable at a very slow speed.

10.5.4.4 Hose lines for the fly ladder pipe must be in the center of the ladder, supported by the rungs and attached with rope hose tools.

10.5.4.5 Move the nozzle up and down slowly without jerking.

10.5.4.6 Ladder pipe load with ladder pipe mounted on top section is limited to approximately 400 pounds nozzle reaction. This is equivalent to a 1¾” tip at 90 psi.

10.5.5 The following chart shows the safe loading and reach for the 100 ft, 4 section Maxim aerial ladder



Safe loading and reach, 100-foot, 4-section Maxim aerial ladder.

10.5.6 The following table shows the maximum extension for various loadings.

| | Maximum Extension (feet) | | |
|---|---|---|---|
| **Angle (degrees)** | **Water tower operation with one person and 600 gpm at top** | **Unsupported operation with two people on top section.** | **Supported operation with four people distributed and hose line.** |
| 80 | 80 | 100 | 100 |
| 70 | 77 | 100 | 100 |
| 60 | 67 | 80 | 100 |
| 50 | 56 | 63 | 93 |
| 40 | 48 | 54 | 76 |
| 30 | 43 | 48 | 70 |
| 20 | | 44 | 65 |
| 10 | | 43 | 62 |
| 0 | | 42 | 61 |

## 11. Annual Service Tests

11.1.1 Annual service tests of the pumps on Engines 1, 2, 3 and Tanker 1 and the aerial ladder on Ladder 1 shall be performed in accordance with NFPA 1911: *Service Tests of Pumps on Fire Department Apparatus* and NFPA 1914: *Testing Fire Department Aerial Devices*. The apparatus team is responsible for conducting the annual pump tests and arranging for the aerial ladder test.

11.1.2 Annual service tests of dry hydrants shall be conducted in accordance with NFPA 1142: *Standard on Water Supplies for Suburban and Rural Fire Fighting.* The Rural Water Supply Officer is responsible for coordinating the dry hydrant tests.

# 12. Thermal Imaging Camera

## 12.1 Policy

12.1.1 The Thermal Imaging Camera (TIC) is to be used in every structure fire and any other situation where it will enhance the safety of fire department personnel. The camera is a tool to make our jobs safer and complete searches more effectively. However, they use of the TIC does not supersede standard fire-ground procedures. The TIC should be used in such a manner as to enhance those procedures.

## 12.2 Procedure

12.2.1 A camera is carried on Engine 1 and Engine 2. Firefighters should become familiar with the location of the TIC's on the apparatus.

12.2.2 It is the officer's responsibility (or person riding in that position) to carry the TIC into a structure whenever the initial response involves, but not limited to, structure fire, alarms and smell of smoke.

12.2.3 When the engine arrives on the scene of a fire or any other incident where smoke will or could hamper visibility, the person riding in the officer's position of the apparatus shall utilize the TIC for size-up and then take it to the entry point of the structure.

12.2.4 When operating in the "Rescue Mode", firefighters shall use available thermal TIC's to aid in the search for victims. If operating ahead of or separate from a hose line, a tag line shall be deployed. The operator of the camera shall don the rope pack and secure the end of the rope to an adequate anchor just outside the entry point.

12.2.5 Subsequent cameras will be used by additional entry crews. The IC may assign a camera to the Rapid Intervention Team.

12.2.6 If conditions warrant the use of a TIC, the officer accompanying the nozzle operator shall be the operator of the TIC. If the attack crew has three or more, or the officer may not be entering the hazard zone, the officer shall make an assignment to one of the crew to utilize the TIC. Camera operators must be aware that they have a tendency to move faster than the rest of the team who are operating in zero visibility. Any team operating in a hazard zone will consist of a minimum of two personnel. Standard firefighting practices should be observed with the TIC's.

12.2.7 In moderate to heavy smoke conditions the TIC allows a crew to quickly check a smoke filled area to determine the presence of fire or possible victims. Firefighters should utilize basic rescue techniques while using the TIC (i.e. search under beds, in closets, under obstructions etc.).

12.2.8 The camera has a tendency to inspire overconfidence because it allows crews to "see" in an environment that in reality has no visibility. Firefighters must remember to use basic fire fighting fundamentals, such as, following and keeping in contact with walls, staying low in heat and smoke and, operating with a hand line or tagline. These and other fundamentals are to be utilized even while using TIC's. All firefighters must understand the camera could fail and an escape route must be easily located.

12.2.9 Thermal Imaging Cameras can also be utilized in the size-up and overhaul phases of fires. It must be remembered the camera cannot penetrate most construction materials including drywall, plaster and lathe, concrete, glass or plastic. Water cannot be penetrated by the TIC.

## 12.3 Thermal Imaging Camera Uses

12.3.1 Provides safer navigation in a space where there is zero visibility due to smoke.

12.3.2 Allows firefighters to “see” in a zero visibility atmosphere allowing them to augment traditional fire fighting and rescue techniques. The time necessary for completing a primary search can be cut by almost half by utilizing a TIC properly.

12.3.3 Enables suppression crews to execute a faster, more effective interior attack. The TIC helps identify the shortest route to the fire. Locate holes in the floor. Obstacles can be located and identified efficiently.

12.3.4 Reduces fatigue of interior crews because of more efficient attack and rescue.

12.3.5 Assists Rapid Intervention Teams in locating downed firefighters.

12.3.6 May be used to determine the fluid levels within a container or “see” liquid differences on water during a hazardous materials incident.

12.3.7 May be used as a search tool to locate lost persons in open wilderness areas.

12.3.8 Useful for size-up tool for initial engine company.

# 13. Traffic Incident Management

## 13.1 General

13.1.1 Members need to operate safely, making every effort to minimize the risk of injury to themselves and those who use the road and highway system. Vehicles operating in the emergency mode need to operate warning devices and follow the SOPs.

13.1.2 Median strip crossovers marked "Authorized Vehicles Only" shall be used for turning around and crossing to the other travel lanes only when emergency vehicles can complete the turn without obstructing the flow of traffic in either travel direction or all movement has stopped.

13.1.3 Response on access ramps shall be in the normal direction of travel, unless the incident commander on the scene can confirm that oncoming traffic has been stopped and no civilian vehicles will be encountered on the ramp.

13.1.4 Shoulder lanes will be used only by emergency vehicles/apparatus.

13.1.5 If possible do not use apparatus for blocking that will be heavily used during the operation. In other words don't use the pumper/rescue to block if personnel will be pulling equipment out of compartments on the traffic side of the vehicle.

13.1.6 Limit Exposure: Once the hazards have been mitigated and patients treated and/or transported the IC should release all fire department personnel and equipment.

13.1.7 Reflective vests and helmets or hard hats shall be worn on all highway/roadway incidents.

## 13.2 Arrival

13.2.1 The first emergency responder arriving at the scene of any highway incident will assume the role of IC. The individual assuming that role is subject to change as additional responders arrive at the scene.

13.2.2 If traffic control assistance is required at an incident scene, the IC should coordinate with the law enforcement for assistance with traffic control. If AOT is going to be needed, give dispatch a brief description of what will be needed and have them contact AOT.

13.2.3 Chapter 6I of the Manual on Uniform Traffic Control Devices (MUTCD) divides traffic incidents into the following three classes:

- Minor — expected duration under 30 minutes.
- Intermediate — expected duration of 30 minutes to 2 hours; and
- Major — expected duration of more than 2 hours;

13.2.3.1 If it is anticipated that the incident on a state or federal road will last more than 2 hours request traffic control assistance either from on-scene state police or through dispatch.

13.2.4 Standard practice will be to position response vehicles in such a manner as to ensure a safe work area. This may be difficult to accomplish at incidents on Class 3 and 4 roads. Position emergency response vehicles in such a manner as to provide the safest area possible.

## 13.3 Parking of Response Vehicles

13.3.1 Providing a safe incident scene for emergency responders is a priority at every emergency incident. However, consideration must be given to keeping as many traffic lanes open as possible. Except for those vehicles needed in the operation and those used as a shield for the incident scene, other response vehicles should be parked together. As a matter of routine, the

parking of response vehicles should be on one side of the roadway. Parking should be on either the shoulder or median side, if one exists, but not both. Parking response vehicles completely out of available travel lanes greatly assists in the movement of traffic. If not needed to illuminate the scene, drivers should remember to turn vehicle headlights off when parked at incidents.

13.3.2 The proper spotting and placement of emergency apparatus is the joint responsibility of the driver and the IC. The proper positioning of emergency response vehicles at the scene of an incident assures other responding resources of easy access, a safe working area and helps to contribute to an effective overall operation. The safety of everyone on the scene is foremost while they are operating, both in emergency and non-emergency situations.

**13.4 On Scene Actions**

13.4.1 An incident safety zone shall be established, allowing fire and rescue units to position in close proximity of the incident. Engine 3 should be placed some distance from the incident, making use of it as a safety shield blocking only those travel lanes necessary.

13.4.2 Before exiting any emergency response vehicle at an incident, personnel should check to ensure that traffic has stopped to avoid the possibility of being struck by a passing vehicle. Personnel should remember to look down to ensure debris on the roadway will not become an obstacle, resulting in a personal injury.

13.4.3 As soon as possible, the initial responding unit should position traffic control devices. Traffic cones assist in channeling traffic away from an incident. Traffic control devices and the "Emergency Scene Ahead" sign shall be used whenever responding vehicles are parked on or near any road surface. Placement of traffic control devices shall begin closest to the incident, working toward on-coming traffic. When placing traffic control devices, care should be exercised to avoid being struck by on-coming traffic.

13.4.4 The speed of traffic and travel distance must be considered when establishing an incident safety zone. The following chart provides an example of how traffic control devices are to be placed.

| **Posted Speed Limit** | **Distance** |
|---|---|
| 35 MPH | 100 FT |
| 45 MPH | 150 FT |
| 55 MPH | 200 FT |
| Greater than 55 MPH | 250 FT Plus |

**13.5 Emergency Vehicle Visibility at Night**

13.5.1 Glare vision and recovery is the amount of time required to recover from the effects of glare once a light source passes through the eye. It takes at least 6 seconds, going from light to dark and 3 seconds from dark to light for vision to recover.

13.5.2 At 50 miles per hour, the distance traveled during a second is approximately 75 feet. In six seconds, the vehicle has traveled 450 feet before the driver has fully regained night vision. This is extremely important to remember when operating on roadways at night.

13.5.3 The headlights on stopped vehicles can temporarily blind motorists that are approaching an incident scene. Drivers of on-coming vehicles will experience the problem of glare recovery. This essentially means individuals are driving by the emergency scene blind. The wearing of protective clothing and/or traffic vests will not help this "blinded" motorist see emergency

responders standing in the roadway. Studies show that at two and one-half car lengths away from a vehicle with its headlights on, the opposing driver is completely blinded.

13.5.4 Low beam headlights can be used to light an emergency scene using care as to light only the immediate area. Complacency at an incident scene can be hazardous.

13.5.5 Scene lighting must be positioned so it does not interfere with the visibility of traffic flowing by the scene. The glare from scene lighting can have the same effect as headlights.

**13.6 Clearing Traffic Lanes**

13.6.1 When outside of a vehicle on a major roadway, emergency responders are in an extremely dangerous environment. It is imperative to take every precaution to protect all responders and those involved at incident scenes. Although positioning emergency response vehicles to serve as a shield for work areas is a prudent practice, we must remember that reducing and/or shutting down traffic lanes creates other problems and safety concerns. Therefore, it is critical when operational phases are completed that emergency response vehicles be repositioned to allow traffic to flow on as many open lanes as possible.

13.6.2 Remember that unnecessarily closing or keeping traffic lanes closed greatly increases the risk of a secondary incident occurring in the resulting traffic backup.

**13.7 Ten Cones of Highway Incident Safety**

13.7.1 The following are the 10 cones of highway incident safety.

1. **There is no substitute for training.**
2. **Multi-agency coordination and communications are a must; a unified incident command is essential.**
3. **Limit your exposure – limit your time.**
4. **Give traffic plenty of warning.**
5. **Protect the scene with apparatus.**
6. **Always work away from the traffic.**
7. **Be prepared to shut down the roadway.**
8. **Be seen and not hurt.**
9. **Dress for the occasion.**
10. **Accountability matters.**

**13.8 Use of Emergency Vehicle Lighting.**

13.8.1 The following is section 6I.05 from the MUTCD.

**Section 6I.05 Use of Emergency-Vehicle Lighting**

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided

facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:
Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to oncoming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.

# 14. Respiratory Program – Emergency Medical Technicians

## 14.1 Emergency Medical Technicians

14.1.1 This SOP supplements procedures described in the Norwich Bloodborne Pathogen Exposure Control Plan and covered in training on infectious disease control.

## 14.2 OSHA Requirements

14.2.1 29 CFR 1910.134(d)(3)(i) requires that for atmospheres that are not IDLH "The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations."

14.2.2 In addition 29 CFR 1910.134(e) requires "Medical evaluation. Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator." 1910.134(e)(1) adds "General The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator."

14.2.3 The department has determined that N95 respirators are required to be worn by EMTs when there is a potential for airborne transmission of an infectious disease.

## 14.3 Definitions

14.3.1 **Airborne Transmission** occurs when bacteria or viruses travel on dust particles or on small respiratory droplets that may become aerosolized when people sneeze, cough, laugh, or exhale. They hang in the air much like invisible smoke. They can travel on air currents over considerable distances. These droplets are loaded with infectious particles.

14.3.2 **Bioterrorism** – 1) The unlawful release of biologic agents or toxins with the intent to intimidate or coerce a government or civilian population to further political or social objectives. Humans, animals, and plants are often targets. 2) Use of microorganisms or toxins to kill or sicken people, animals or plants. The main difference between biological terrorism and conventional terrorism (i.e. bombs, hijackings, etc.) is the duration from the time of attack to the presentation of victims of the attack. Depending on the agent, the incubation period can be up to 60 days. It is highly probable that hospitals, not traditional first responders, will be the first to recognize a bioterrorism event secondary to the unfolding epidemiology and gradual increase in attack rates of a communicable agent. Hazardous Materials Operations level training is the minimum level of training needed to treat any patient that is not fully decontaminated.

14.3.3 **Influenza** (Flu) is a contagious infection of the nose, throat, and lungs caused by the influenza virus. The most common way to catch the flu is by inhaling droplets from coughs or sneezes. Less often, it is spread when you touch a surface such as a faucet handle or phone that has the virus on it, and then touch your own mouth, nose, or eyes.

14.3.4 **N95 Respirator** – NIOSH certified N95 respirators/masks are designed to help provide respiratory protection for the wearer. The N95 respirator/mask has a filter efficiency level of 95% or greater against particulate aerosols free of oil when tested against a 0.3 micron particle. It is fluid resistant and disposable. The "N" means "Not resistant to oil". The "95" refers to a 95%

filter efficiency. N95 respirator/mask with an exhalation valve may be used by EMTs. Patients should not wear an N95 mask with exhalation valve, because this valve could disseminate the virus into the environment.

14.3.5 **Pulmonary Tuberculosis** is a contagious bacterial infection caused by Mycobacterium tuberculosis (TB). The lungs are primarily involved, but the infection can spread to other organs. Tuberculosis can develop after inhaling droplets sprayed into the air from a cough or sneeze by someone infected with Mycobacterium tuberculosis. The disease is characterized by the development of granulomas (granular tumors) in the infected tissues.

14.3.6 **Severe Acute Respiratory Syndrome** (SARS) is a serious form of pneumonia, resulting in acute respiratory distress and sometimes death. SARS can be spread by droplet contact. When someone with SARS coughs or sneezes, infected droplets are sprayed into the air. Like other coronaviruses, the SARS virus may live on hands, tissues, and other surfaces for up to 6 hours in these droplets and up to 3 hours after the droplets have dried. SARS may also be spread by hands and other objects the droplets had touched.

14.3.7 **Smallpox** is a viral disease characterized by a skin rash and a high death rate. Smallpox is highly contagious from one person to another. It is most contagious during the first week, and is spread from saliva droplets. It may continue to be contagious until the scabs from the rash fall off.

**14.4 Goal**

14.4.1 To prevent transmission of infectious airborne agents including influenza, SARS, TB and smallpox which may be prevented by the use of a N95 respirator.

14.4.2 The department will provide NIOSH approved N95 respirators to all members of the EMS division and members are required to use the N95 respirator as provided in this SOP.

**14.5 Medical Evaluation and Fit Test**

14.5.1 Members of the EMS Division (EMTs) shall have a medical evaluation using forms supplied by the department and done by a physician or other licensed health care professional that determines the members ability to use a respirator in accordance with OSHA requirements and successfully complete a qualitative or quantitative respirator fit test before responding to calls and at least annual fit tests thereafter. Additional medical evaluations are required whenever there is a change in the physical condition of the member or change in workplace conditions. Additional fit tests are required whenever the employee reports, or the employer makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight. The department will make arrangements for the medical evaluations and fit testing.

**14.6 N95 Respirator Use Indication:**

14.6.1 The N95 respirator shall be worn whenever there is confirmation or a suspicion due to a patient's medical history or physical condition or other information that would indicate that an airborne infectious disease or suspected bioterrorism exists. Examples of signs and symptoms of a potential for an airborne infectious disease include a patient that has aerosol or droplet expression due to coughing or sneezing, fever, or rash that may be indicative of TB, SARS, Influenza, or smallpox. If a N95 respirator is worn, it should be worn for the duration of patient care and treatment after being donned. Care must be exercised during low temperatures because of possible freezing and/or improper sealing, of the exhalation valve.

14.6.2 If the patient that has the signs and symptoms described above and will tolerate a mask they should be fitted with an N95 respirator WITHOUT an exhalation valve.

**14.7 Procedure Guidelines:**

14.7.1 The following are generic instruction for respirator donning. Members are responsible for knowing the appropriate methods for donning the respirator they have been issued.

14.7.2 Putting on the mask

14.7.2.1 Obtain the appropriate mask as previously determined by fit testing.

14.7.2.2 Remove the mask from its wrapper.

14.7.2.3 Hold the respirator in its flat, folded format. Keeping the respirator closed, bend the nose clip around your finger to form a shape that matches your nose. Then bend the ends of the nose clip so that they have a slight upward flare. Open the respirator carefully so that there is minimal handling inside the respirator.

14.7.2.4 Pull the lower portion of the headband strap so that it hangs longer than the upper portion of the strap. The upper portion of the strap should be against the nose clip. Remove any twists in the strap. Hook the respirator under your chin and stretch the lower portion of the strap over your head. Position the strap around your neck.

14.7.2.5 Pull the portion of the strap that is against the nose clip over your head. Position it high on your head and above your ears. Adjust the straps so that there is equal tension on all four straps.

14.7.2.6 Using your fingers, shape the nose clip so that the respirator seals over your nose. Ensure that the respirator fits comfortably and that it seals against your face.

14.7.2.7 Perform a user seal check (i.e., pressure-tightness test, fit check, or negative/positive pressure check) according to the manufacturer's instructions. If you are unable to achieve a proper fit, DO NOT enter the contaminated area.

14.7.3 Removing the mask

14.7.3.1 Remove the mask from the face by using the head strap only.

14.7.3.2 Discard the mask into the appropriate biomedical waste receptacle if it has:

14.7.3.2.1 Been used with a patient with documented respiratory infection.

14.7.3.2.2 Been contaminated with blood or OPIM

14.7.3.2.3 Been damaged so that the structural integrity is compromised.

14.7.3.2.4 Wash hands either with soap and water or a waterless hand cleaner. Hands should be washed with soap and water at completion of treatment or call.

**14.8 Reporting of Potential Exposure**

14.8.1 EMTs who believe they have been exposed to an airborne pathogen shall report the potential exposure using the procedures and forms in the Norwich Bloodborne Pathogen Exposure Control Plan.

# 15. Respiratory Program – Interior Firefighters

## 15.1 Interior Firefighters

15.1.1 Introduction

15.1.1.1 In the performance of their duties, firefighting personnel must be prepared to enter atmospheres that pose an immediate threat to life or health. In order to provide for the safety of the firefighter, whenever a firefighter enters a known or suspected toxic atmosphere the firefighter shall:

15.1.1.1.1 Don a positive pressure type breathing apparatus before entering.

15.1.1.1.2 Use the Self Contained Breathing Apparatus (SCBA) in accordance with procedures set forth in the Standard Operating Procedure.

15.1.1.2 All interior qualified firefighters shall have an OSHA medical evaluation using forms supplied by the department and have an annual facemask fit test. In addition all interior qualified firefighters are responsible to don the SCBA once every three months and record in the SCBA records book. Donning during an incident meets these requirements if it is recorded.

15.1.2 Standard Practice

15.1.2.1 When entering a contaminated atmosphere, such as harmful dust, fogs, fumes, mists, gasses, smokes, sprays or vapors, the primary objective shall be to prevent atmospheric contamination to personnel of the Norwich Fire Department.

15.1.2.2 SCBA with integrated PASS devices shall be worn whenever there is a IDLH atmosphere including all structure fires, hazardous materials incidents, vehicle fires and in overhaul operations until the air has been cleared.

15.1.2.3 On hazardous materials incidents, breathing apparatus will be worn until the Incident Commander knows for a fact that it is safe for removal.

15.1.3 Respiratory Program

15.1.3.1 Firefighting personnel shall wear positive pressure type breathing apparatus that the Department provides for the firefighter. These units shall be worn when entering contaminated atmospheres.

15.1.4 Selection:

15.1.4.1 The Norwich Fire Department will purchase only positive pressure type SCBA.

15.1.4.2 The reason positive pressure demand type and positive pressure apparatus are used by the firefighting personnel of the Norwich Fire Department is due to the dangerous atmospheres the firefighting personnel are required to enter while performing their duties. The atmospheres encountered during an emergency are generally unknown in their contaminant and the level of contaminant. Use of the positive pressure type SCBA offers the greatest degree of protection to firefighting personnel that can presently be obtained, thus reducing the risk of exposing the firefighter to the dangerous atmosphere.

15.1.5 Training and Instruction:

15.1.5.1 The user shall be instructed and trained in the proper use of the respirators as well as the limitations of the respirators. Instruction and training for the firefighting personnel consists of, but is not limited to, the following:

15.1.5.1.1 Explanation and discussion of the respiratory hazards that are likely to be encountered by firefighting personnel and what happens if the respirator is not used properly.

15.1.5.1.2 The reasons why the Norwich Fire Department has selected to supply their firefighting personnel with positive pressure type respirators.

15.1.5.1.3 The function, capabilities and limitations of positive pressure type respirators.

15.1.5.1.4 The method of donning, checking for proper fit and operation and the proper wearing of respirators.

15.1.5.1.5 Respirator maintenance and care.

15.1.5.1.6 The proper use and care of the respirators in an emergency.

15.1.6 Cleaning and Disinfection:

15.1.6.1 Respirators shall be regularly cleaned and disinfected after each use. This shall be done by following the recommended cleaning and disinfecting practices of Scott Aviation. The following Scott forms shall be used as guidance in performing the cleaning and disinfecting of the respirators:

A. Scott form 89290-01 1/93 Operation and Maintenance Instructions

B. Scott form H/S 5518B 9/91 Field Level Maintenance Manual

15.1.6.2 The following are excerpts from Scott form 89290-01 1/93 Operation and Maintenance Instructions:

1. Clean the respirator after each use as follows:
    a. Inspect the equipment for worn or aged rubber parts, worn or frayed harness webbing or damaged components.
    b. Remove the breathing regulator from the facepiece.
    c. Carefully wash the facepiece with warm (110° F maximum) soap or detergent solution and thoroughly rinse in clean water.
    d. Disinfect the facepiece by one of the following methods:
        1. Sponge it with a 70% solution of ethyl or isopropyl alcohol, or
        2. Submerge it in a hypochlorite solution made with two tablespoons of chlorine bleach in one gallon of water.
    e. Rinse in cool water and allow to completely air dry.
    f. Connect the breathing regulator to the regulator holder.
    g. Damp-sponge dirt accumulations from the rest of the respirator.
    h. Replace the respirator in the carrying case or vehicle bracket, making sure all components are thoroughly dry.
2. If any damage or deterioration is noted, remove the respirator from service and tag for repair by authorized personnel.

15.1.7 Inspection:

15.1.7.1 The Norwich Fire Department has a monthly maintenance inspection record for each SCBA and each cylinder.

15.1.7.2 The following is the system that will be used at the Norwich Fire Department to assure a chain of reliable record keeping. This system delegates responsibilities to selected individuals

who should be contacted should the need arise.

15.1.7.2.1 Each SCBA shall be inspected monthly and after each use.

15.1.7.2.2 All firefighting personnel shall read and familiarize themselves with the forms mentioned under inspection.

15.1.7.2.3 Each SCBA and tank is assigned a designation, which shall correspond with a maintenance record report form used for inspections.

15.1.7.2.4 After each inspection of the SCBA, firefighting personnel shall record the proper information on the maintenance record report form.

15.1.8 The following are excerpts from Scott form 89290-01 1/93 Operation and Maintenance Instructions for regular operational inspections with modifications for the Donning Switch:

15.1.8.1 Visually inspect the complete respirator for aged or worn rubber parts, worn or frayed harness webbing or damaged components.

15.1.8.2 Check the latest cylinder hydrostatic test date to ensure it is current, i.e., within three years for composite (fiberglass overwrapped) cylinders.

15.1.8.3 Visually inspect cylinder for dents or gouges in metal or in fiberglass wrapping. Cylinders which show damage or exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, gauge lens melted or elastomeric bumper distorted, shall be removed from service and emptied of compressed air.

15.1.8.4 Check cylinder pressure gauge for “FULL” indication. If cylinder pressure is less than 4,000 psi replace with a fully charged cylinder.

15.1.8.4.1.1 Check to ensure reducer hose coupling is hand-tightened to the cylinder valve outlet.

15.1.8.4.2 Check to ensure that the breathing regulator purge valve (red knob on regulator) is closed (full clockwise position).

15.1.8.4.3 Don the facepiece or hold the facepiece to the face to effect a good seal.

15.1.8.4.4 Slowly open the cylinder valve fully by rotating knob counter-clockwise. Vibralert alarm shall actuate and stop. There shall be no airflow in the facepiece.

15.1.8.4.5 Breathe normally from the facepiece to ensure proper operation.

15.1.8.4.6 Rotate purge valve ½ turn clockwise position. Air shall flow freely from the regulator.

15.1.8.4.7 Rotate purge valve ½ turn counter-clockwise position. Airflow from regulator shall stop, but air shall be supplied on inhalation.

15.1.8.4.8 Push in and rotate cylinder valve knob clockwise to close. When cylinder valve is fully closed, inhale and exhale in the facepiece to breathe-down the residual air from the system. The Vibralert shall actuate as the pressure drops below 1,000 psi. When airflow stops, return the purge valve to the fully closed (full clockwise position).

15.1.8.4.9 Reset the Donning Switch.

15.1.8.4.10 Remove the facepiece from the face.

15.1.9 SCBA Use

15.1.9.1 Firefighting personnel shall be responsible for the following:

15.1.9.1.1 Firefighting personnel shall use the approved respirator and integrated PASS device in accordance with the instruction and training received.

15.1.9.1.2 Firefighting personnel shall guard against damage to the SCBA.

15.1.9.1.3 Firefighting personnel shall report any and all malfunctions of the SCBA to the Chief or Deputy Chief.

15.1.9.2 When repairs to a regulator are needed, they shall be performed by Scott Aviation certified technicians.

15.1.10 Fire Ground Surveillance:

15.1.10.1 It shall be the responsibility of all fire officers to keep a surveillance of the firefighting personnel's condition and degree of exposure and/or stress on the fire ground.

15.1.11 Qualification of Users:

15.1.11.1 All interior qualified firefighting personnel of the Norwich Fire Department shall be qualified annually with quarterly refreshers to help determine which members will be eligible to use the SCBA.

**15.2 Safe Use of Respirators**

15.2.1 When approaching hazardous materials incidents, the officer in charge shall have the responsibility to assure that all of the firefighting personnel don SCBA.

15.2.2 When the air supply alarm is triggered, indicating 20-25% of the air cylinder's capacity is remaining, the firefighting crew shall return to a safe atmosphere immediately.

15.2.3 It is the policy of this department that, whenever SCBA are being used, the firefighting personnel shall always work, as a minimum, in pairs.

**15.3 Training**

15.3.1 It is the policy of this department that all interior firefighting personnel be trained in the safe use of SCBA. Training shall include demonstrations and practice in how the SCBA should be worn, how to adjust the facepiece and harness properly and how to determine if the facepiece fits properly. Firefighting personnel will also be instructed in the conditions that prevent a good face seal.

15.3.2 Interior firefighting personnel shall be qualified annually and receive quarterly refreshers. The annual qualification shall include a review of the items covered in the Respiratory Program section of the SOPs and ability to don an SCBA. Quarterly refreshers shall include a demonstration of the ability to don an SCBA.

15.3.3 The following method will be used to determine if the wearer has obtained a good facepiece fit. After donning SCBA and facepiece, inhale sharply to actuate respirator. Close cylinder valve by simultaneously pushing in on cylinder valve knob and rotating it clockwise. Breath on respirator until airflow stops. Vibralert alarm will actuate, then stop. Inhale slowly and hold your breath momentarily. No leakage of air shall be detected and the facepiece shall be drawn slightly to the face. Open cylinder valve and breath normally.

15.3.4 No interior firefighting personnel shall have a growth of beard, thick sideburns, or have forehead hairs that project under the facepiece; nor should glasses with temples be worn when using SCBA. The absence of one or both dentures can seriously affect the fit of a facepiece.

**15.4 Rapid Intervention Team (Two In - Two Out)**

15.4.1 Purpose

15.4.1.1 To establish standard procedures that will serve to provide a safe working environment for all personnel and to reduce the risk of injury or death as a result of department operations at

emergency incidents. This policy will serve to comply with the 2-In, 2-Out provisions in 29 CFR Part 1910.134 *Respiratory Protection* and NFPA 1500: *Standard on Fire Department Occupational Safety and Health Program*.

15.4.2 Policy

15.4.2.1 To operate as safely and effectively on emergency scenes as possible the following procedures shall be adhered to by all personnel.

15.4.3 Definitions

15.4.3.1 IDLH Atmosphere: An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individuals ability to escape from a dangerous atmosphere.

15.4.3.2 Rapid Intervention Team (RIT): A specifically designated team, with a minimum of 2 interior qualified firefighters, designed to provide personnel for the rescue of emergency service members operating at emergency incidents if the need arises.

15.4.3.3 Incipient Fire: A fire in the initial or beginning stage that can be controlled or extinguished by portable fire extinguishers. However, it is the policy of the Norwich Fire Department to deploy at least a 1¾" hand line any time there is a fire inside of a structure.

15.4.3.4 PAR: Personnel Accountability Report

15.4.4 Procedures

15.4.4.1 The first arriving company shall determine if the incident involves an IDLH atmosphere. At no time shall individuals enter an IDLH atmosphere independently. Teams of at least 2 SCBA equipped interior qualified firefighters shall be required for entry into an IDLH atmosphere at any time.

15.4.4.2 In fire situations, it will be necessary for the IC to determine if the fire is in the incipient stage. A team of 2 interior qualified firefighters may take action to extinguish an incipient fire without the establishment of an initial RIT.

15.4.4.3 If the presence of an IDLH atmosphere has been determined, and there are less than 4 interior qualified firefighters on the scene, the companies shall wait until at least 4 interior qualified firefighters are assembled on the scene before initiating operations within the IDLH atmosphere. Two interior qualified firefighters may begin operating within the IDLH atmosphere as long as 2 additional properly equipped interior qualified firefighters are outside the IDLH atmosphere to serve as the initial RIT. One of the outside RIT members may be assigned other tasks and/or functions so long as these tasks and/or functions can be abandoned, without placing any personnel at additional risk, if rescue or assistance is needed.

15.4.4.4 Members operating in IDLH atmospheres shall use SCBA and work in teams of 2 or more. They shall maintain voice or visual contact with each other at all times. Portable radios and/or safety rope tethering are not acceptable as replacements for voice or visual contact. Radios can be used for fireground communications, including communications between interior and exterior teams. They cannot, however, be the sole method for accounting for one's partner during interior operations. Team members must be in close proximity to each other to provide assistance in case of an emergency.

15.4.4.5 Until 4 interior qualified firefighters are assembled, operations outside of the IDLH atmosphere shall commence immediately. These operations include, but are not limited to, establishment of water supply, exterior fire attack, establishment of a hot zone, utility control,

ventilation, placement of ladders, forcible entry, exposure protection and any other exterior operations deemed appropriate by the IC.

15.4.4.6 The RIT Team shall consist of not less than 2 interior qualified firefighters. For complex incidents the RIT shall be expanded to 1 officer and 3 firefighters as soon as resources are available. For large incidents it may be necessary to have multiple RITs. A company assigned as the RIT shall report to the IC. The RIT cannot be used to relieve another crew unless a replacement RIT has been established. The tools needed by the RIT are dependent on location, conditions, extent and complexity of the incident.

15.4.4.6.1 The following is an example of the equipment that should be considered by the RIT officer.

- Tarp (tool placement)
- SCBA for each member
- Spare SCBA bottles
- RIT Bag w/spare facepiece
- Basket stretcher
- Backboard
- Medical bag
- AED
- Rope – 100' minimum
- TIC (if available)
- Portable radios
- Irons
- Pike poles
- Hand lights
- Folding ladder
- Saws

15.4.4.6.2 The RIT officer is responsible to maintain RIT integrity and to constantly evaluate conditions and monitor all radio communications.

15.4.4.7 If a firefighter(s) becomes trapped, disabled, or otherwise in need of assistance by the RIT, the IC shall announce this action via radio. All radio traffic on the radio frequency being used by the firefighter(s) in need of assistance and not directly related to the firefighter(s) rescue shall cease immediately to facilitate the rescue. An immediate PAR shall be conducted. The IC shall then assign firefighters to assist in the rescue and to assist the RIT as deemed appropriate. The RIT shall continue to inform the IC of their progress and actions taken during the rescue.

15.4.4.8 Should the IC order a building evacuation, a PAR shall be conducted immediately after the building has been evacuated. The RIT shall remain in place for immediate activation should a team fail to report during the PAR.

15.4.5 Exceptions

15.4.5.1 If upon arrival at a fire emergency, firefighters find a fire in its incipient stage, extinguishment of such a fire shall be permitted with less than 4 interior qualified firefighters on the scene. Extinguishment of outside fires such as dumpster, brush, or automobiles, shall be permitted with less than 4 interior qualified firefighters, even if SCBA are being worn.

15.4.5.2 If upon arrival at the scene, if firefighters find an imminent life-threatening situation or probable life threatening situation where immediate action may prevent the loss of life or serious injury, such action shall be permitted with less than 4 interior qualified firefighters on the scene when the probability of a rescue is made in accordance with normal size-up indicators and fireground evaluation factors.

15.4.5.3 The IC shall evaluate the situation, considering the occupancy, time of day, day of week, reports from persons on the scene, signs that persons may be inside the structure, etc.

Entry may be considered if signs indicate a probable victim rescue and the risk to firefighters is proportional to the probability of a successful rescue operation. In the absence of clear signs or a report from a responsible person on the scene that people are in the structure, it is to be assumed that no life hazard exists and interior attack shall not be initiated until the minimum 4 interior qualified firefighters are on the scene.

15.4.5.4 If firefighters are going to initiate actions that would involve entering an IDLH atmosphere because of a probable or imminent life-threatening situation where immediate action may prevent the loss of life or serious injury, and personnel are not on the scene to establish an initial RIT, the firefighters should carefully evaluate the level of risk that they would be exposed to by taking such actions. In all cases a minimum of 2 firefighters shall form the entry team.

15.4.5.5 If it is determined that the situation warrants immediate intervention and 4 interior qualified firefighters are not on the scene, the IC shall notify dispatch of the intent to enter the IDLH atmosphere prior to the availability of a RIT. Dispatch shall then notify all responding companies of this action and receive acknowledgment from each company that the transmission was received.

15.4.5.6 If the IC deviates from this policy under this exception the actions taken shall be documented on the fire incident report. The narrative of this report shall be by the IC who made the decision and outline the reasons, rationale, justification, and end result of the deviation from the standard operating procedure. All information in the report shall be of enough depth so as to provide a comprehensive understanding of the actions taken.

**15.5 Mayday**

15.5.1 The following are the procedures to be followed by a firefighter in need of assistance.

15.5.1.1 Announce over the radio a “Mayday” and activate the manual alarm button on the SEMS unit.

15.5.1.2 Stay calm, preserve your air supply

15.5.1.3 Provide a situation/problem report

15.5.1.4 If trapped or disoriented as a crew, stay together

15.5.1.5 Search for an exit - look for light

15.5.1.6 Attempt to follow a hose line/life line to safety

15.5.1.7 Retreat to an area of safety

15.5.1.8 Assume a horizontal position to enhance the audible signal of your PASS and enhance thermal protection

15.5.1.9 Use your flashlight as a beacon device.

15.5.1.10 Attempt to make tapping noises using tools or other objects.

**15.6 SCBA Firefighter Overcome**

15.6.1.1 Whenever a wearer of SCBA is overcome, the following steps shall be taken:

15.6.1.2 Have appropriate emergency medical care provided by EMS personnel.

15.6.1.3 Transport the victim to a hospital, if necessary.

15.6.1.4 Report the incident to the officer in charge.

15.6.1.5 The SCBA shall immediately be put out of service, making sure not to tamper with any of the valves or shut-offs. Should there be a need to change the position of any valve or device

on the SCBA, report the changes made, the number of turns needed to close a valve and the reason for doing so.

15.6.1.6 Once you have the unit in your possession, take it directly to the Incident Commander.

15.6.1.7 The officer in charge will then find a safe and secure place for it until the proper authorities take it.

15.6.1.8 At no time and for no reason shall anyone take or touch the SCBA without the Chief being notified.

**15.7 SEMS System**

All Norwich SCBA are equipped with a SCOTT Electronic Management System (SEMS). The SEMS is intended to compliant the departments accountability system. This equipment can transmit and receive specific information between the respirator users and the Base Station operator. The SEMS equipment has two primary functions:

1. Personal Alert Safety System (PASS) Distress Alarm.
2. Evacuation Signal.

Other functions include:

1. Monitoring SCBA operation.
2. Monitoring air supply cylinder level.
3. Sending withdraw signal to base station.

Each SCBA with SEMS has two identification tags attached to the harness. One is permanently attached and one removable. The tag identifies the SEMS ID, apparatus and seat assignment. When a firefighter dons the SCBA the removable tag shall be attached to the firefighter's interior accountability tag.

The accountability sector shall be responsible for operation of the SEMS base station and monitoring interior firefighters.

**15.8 Rehabilitation.**

15.8.1 Two bottles or 45 minutes of work time followed by rehabilitation.

15.8.2 Rehydration with at least eight ounces of liquid without caffeine, preferably non-carbonated. Diluted sports drink is OK.

15.8.3 Medical evaluation.

15.8.3.1 General condition.

15.8.3.2 Heart rate and temperature.

15.8.3.3 Measure heart rate for minimum of 30 seconds.

15.8.3.4 If heart rate less than 110, minimum of ten minutes of rest.

15.8.3.5 If heart rate exceeds 110 take oral temperature.

15.8.3.5.1 If temperature is elevated but below 100.6 °F, extend rehabilitation period.

15.8.3.5.2 If temperature exceeds 100.6 °F, firefighter is not permitted to wear protective equipment. Continue to monitor condition.

15.8.3.5.3 Check Carboxyhemoglobin using the Masimo Rad-57, if available, and treat as appropriate. In addition since hydrogen cyanide is present in fire smoke more commonly and in

greater quantities than previously believed due to modern materials such as plastics, rubber, asphalt, and polyacrylonitriles consider the possibility of hydrogen cyanide poisoning. Symptoms of cyanide poisoning are similar and commonly attributed to carbon monoxide poisoning.

15.8.4 After release from Rehabilitation firefighters shall report to Personnel Staging.

## 16. Personnel Accountability

16.1.1 This accountability system shall be used during all firefighting, rescue, training or other fire department emergency operations. The status of all Norwich and other personnel on scene shall be tracked.

16.1.2 Each active Norwich firefighter shall be issued two accountability tags. One tag is for scene accountability and one for entry and team accountability. SCBA qualified firefighter's accountability tag shall be on a green background. Non-SCBA qualified firefighter's accountability tag shall be on a red background. The front of the accountability tag shall have Norwich Fire Department and the member's name and rank. The back of the tag shall list the current qualifications of the member in the following areas; Firefighter I or II, Fire Officer I or II, SCBA (Interior Qualified), Hazardous Materials (P = Propane Qualified, G = Gasoline Qualified), Incident Command (Incident Command requires Hazardous Materials Operations and rank of Captain or above.) and EMT-B, I or P.

16.1.3 Each active Norwich EMT that is not a firefighter shall be issued two accountability tags on an orange background. One tag shall be used for scene accountability consistent with the provisions of this section on any incident that also involves the fire department like a structure fire, motor vehicle accident or multiple casualty incident. The second tag is for team accountability and is given to the member's team leader.

16.1.4 Additional accountability tags and company collector rings are available for mutual-aid and other emergency and non-emergency personnel that do not have an accountability system compatible with the Norwich system. Mutual-aid firefighters that do not use an accountability system with two tags that is compatible with the Norwich accountability system shall be issued a yellow accountability tag. Non-fire emergency personnel shall be issued an orange accountability tag. Non-emergency personnel shall be issued a pink accountability tag.

16.1.5 The scene accountability tag shall be attached to the D ring on the back of the helmet. FAST only members shall carry with their EMS equipment. The entry/team accountability tag shall be attached to the snap on the right front of the coat.

16.1.6 The scene accountability tag shall be attached to the company ring in route to the call. The company rings with scene accountability tags shall be attached to the scene accountability board. The First Due Collection Board shall be used on Still Alarms. First Alarms or greater shall use the Collection Binder. On a mutual-aid assignment the company ring shall be given to the accountability section of the host department. Any reassignment of personnel to another company shall be tracked on the scene accountability board. FAST only members shall provide their scene accountability tag to the member assigned accountability.

16.1.7 The entry accountability tag shall be given to the leader of the team that the firefighter is assigned to. The team leader shall attach the tags of the team to the team leaders tag. It is the responsibility of the team leader to keep track of the firefighters assigned to their team. It is the responsibility of the assigned firefighter to stay with their team and carry out assignments as directed by the team leader. Team leaders may be fire department officers or firefighters

assigned team leadership responsibility by Incident Command, Operations or Personnel Staging.

16.1.8 Firefighters reporting to a scene shall report to command or other designated officer such as staging for assignment.

16.1.9 The team leader of firefighting teams that are conducting interior operations or working in a hot zone shall give the tags for their team, including their own, to the entry control officer before entering the building or hot zone. If an entry control officer has not been assigned the tags shall be given to the pump operator of the first arriving engine. The entry control officer shall record the team name, time of entry, SCBA pack designation, SCBA bottle pressure and assignment on the entry form. During the initial stages of an operation the entry control officer shall be the lead engine pump operator until the function is reassigned.

16.1.10 The entry control officer shall track the time of each team in a hazardous atmosphere and conduct PARs as needed to assure firefighter accountability and safety.

16.1.11 A maximum of twenty minutes is allowed in a hazardous atmosphere per bottle.

16.1.12 Two bottles of air used by firefighting personnel should require a ten (10) minute break. The exception to this rule would be when the Incident Commander or designee makes a decision that a third bottle may be used without compromising firefighter safety.

16.1.13 4.4.8. The emergency signal for all personnel to evacuate shall be a radio broadcast followed by three 5–second blasts of apparatus air-horns, or in the absence of air-horns other audible warning devices, followed by a second radio broadcast and activation of the SEMS evacuation signal.

16.1.14

# 17. Carbon Monoxide Incident

## 17.1 Scope

17.1.1 This section establishes general operational procedures to use when responding to incidents involving the activation of Carbon Monoxide (CO) detectors.

## 17.2 General

17.2.1 Carbon monoxide is an odorless, tasteless, colorless gas that is deadly. It is a by-product of a fuel burning process. Many appliances such as furnaces, kitchen stoves, hot water heaters, automobiles, etc. can produce carbon monoxide. When a faulty device or unusual conditions exist, carbon monoxide may be vented into areas where people are present. CO is approximately the same weight as air. It may rise when mixed with heated air. A typical CO MSDS is in the SOP Appendix.

17.2.2 Carbon monoxide poisoning may be difficult to diagnose. Its symptoms are similar to the flu, which may be headache, nausea, fatigue and dizzy spells. Children may be more susceptible and tolerance to CO can vary among adults.

17.2.3 The Occupational Health and Safety Administration has established a maximum safe working level for carbon monoxide at 35 parts per million (ppm) over an eight hour period, in the general workplace. The US Environmental Protection Agency has established that residential levels are not to exceed 9 ppm over an eight hour average.

## 17.3 Receipt of Alarm

17.3.1 Dispatch shall attempt to verify if the device activating the alarm is a CO detector or a smoke detector.

17.3.2 If it is a CO detector:

17.3.2.1 Determine if any persons at the scene are exhibiting signs of CO poisoning

17.3.2.2 Take all other usual information

17.3.2.3 Advise caller to alert other occupants and advise that all occupants evacuate the building.

## 17.4 Response to CO Alarms

17.4.1 The response to CO alarms when no symptoms of CO poisoning are reported shall be one engine with the multi-gas meter/CO monitor responding with the flow of traffic. The response to CO alarms when any symptoms of CO poisoning are reported shall be two engines as an emergency response with the multi-gas meter/CO monitor and with an EMS response.

## 17.5 On Scene Operations

17.5.1 Determine the source of the alarm. If it is a smoke detector, investigate the cause of the alarm and take necessary steps to mitigate the situation. If it is a CO detector, proceed as described in this section.

17.5.2 Confirm that all occupants have evacuated the building and determine if anyone is exhibiting symptoms of CO poisoning. If so, immediately request Emergency Medical Services (EMS) response, if not already responding.

17.5.2.1 EMS shall evaluate the patient, including using the Masimo Rad-57 if available, to evaluate patient Carboxyhemoglobin (COHb), and treat the patient in accordance with DHMC Patient Care Protocols. Record the time and COHb concentration on the PCR.

17.5.2.2 The Rad-57 has two preset alarms. If the $SpO_2$ is 90% or less or the COHb is 10% or more.

17.5.2.3 The Rad-57 uses a reusable sensor and patient cable that can be cleaned using the following procedure

- Remove the sensor from the patient.
- Disconnect the sensor from the patient cable.
- Disconnect the patient cable from the monitor.
- Wipe the entire sensor and/or patient cable clean with a 70% isopropyl alcohol pad.
- Allow to air dry thoroughly before returning it to operation,

17.5.2.4 The half-life of COHb may vary depending on the duration and concentration of exposure to CO. A rule of thumb is that COHb has a half-life in the body of 5 hours when breathing room air and 90 minutes on 100% $O_2$. CO health effects are commonly considered in terms of the percentage of CO in blood's hemoglobin, which is expressed as % COHb. In the average nonsmoker, COHb is 1.5% or less (0.7% due to metabolism) while heavy smokers' COHb may be as high as 10%. Environmental tobacco smoke can raise COHb in a nonsmoker to 2 to 3%. No adverse health effects have been reported below 2% COHb. A level of 2.5% COHb will cause chest pain in persons suffering from angina pectoris and it can result from CO exposure at 50 parts per million (ppm) for 90 minutes or 15 ppm for 10 hours. The following are typical symptoms of various levels of COHb in a healthy person.

- 10 % COHb no effect
- 15 % COHb slight headache
- 20 % COHb headache
- 25 % COHb headache and nausea
- 30 % COHb drowsy
- 35 % COHb vomiting
- 40 % COHb collapse
- 45 % COHb coma and permanent brain damage
- 50 % COHb permanent brain damage, death

17.5.3 All firefighting personnel shall wear full protective gear and use Self Contained Breathing Apparatus (SCBA) in any atmosphere in excess of 35 ppm of CO.

17.5.3.1 Monitor area immediately outside the entry door.

17.5.3.2 Initiate a survey of the premises using the Meter Checklist Form to determine if there are CO readings present that exceed 9 ppm.

17.5.3.3 Continue monitoring the atmosphere and contact the occupants.

17.5.3.4 Determine if anyone is exhibiting symptoms of possible CO poisoning. If so, evacuate the occupants from the building, request EMS response, and ventilate immediately using natural ventilation and electric powered fans.

17.5.3.5 If no one exhibits symptoms of CO poisoning, it will not be necessary to evacuate the premises unless a level of more than 9 ppm is detected by a monitor.

17.5.3.6 The Incident Commander shall assign the responsibility for completing the Notice of Findings form, have a record copy signed by the occupant and leave a copy with the occupant.

17.5.4 The Orion meter may take up to 37 seconds to reach 90% of the actual CO level. In other words, it may take the meter 37 seconds to reach a reading of 31 ppm in an atmosphere that has

an actual level of 35 ppm.

17.5.5 The CO meter gives a visual and audible low rate warning at 35 ppm and a high rate visual and audible alarm at 100 ppm. The low rate audible warning can be reset.

17.5.6 The incident commander shall request that the appropriate service representative for a gas appliance respond to the scene if:

1. CO level is 9 or more ppm.
2. Firefighting personnel turn off the fuel to any appliance.
3. Anyone is showing signs of being ill due to CO poisoning.
4. The incident commander feels that a response by the service representative is needed.

**17.6 Action for Various Levels of CO**

17.6.1 Readings of 9 ppm or less:

1. Inform the occupants that our instruments did not detect an elevated level of CO at this time.
2. Recommend that they check the CO detector according to the manufacturer's recommendations.
3. Attempt to reset the detector.

17.6.2 Readings of more than 9 ppm but less than 100 ppm:

1. Any reading above 9 ppm shall be considered above normal reading.
2. Occupants shall be informed that we have detected a potentially dangerous level of CO.
3. Recommend that all persons leave the premises and begin ventilation.
4. If it is determined that an appliance is malfunctioning and thereby producing CO, it shall be shut down.
5. Once the premises has been reduced to a safe level of CO, the premises may be occupied, at the discretion of the occupant.
6. Attempt shall be made to reset the detector.
7. The occupants shall be informed of the action that has taken place.

17.6.3 Reading of 100 ppm or greater:

1. Any reading of 100 ppm or greater, inform the occupants that we have detected a potentially lethal level of CO.
2. Order the occupants to leave the premises immediately.
3. If it is determined that an appliance is malfunctioning and thereby producing CO, it shall be shut down.
4. Once the premises has been reduced to a safe level of CO, the premises may be occupied, at the discretion of the occupant.
5. Attempt shall be made to reset the detector.
6. The occupants shall be informed to contact their heating or appliance contractor or gas company.

## 17.7 Gas Meter Operation and Maintenance

17.7.1 This section applies to the two MSA Orion Multigas meters and the MSA MiniCO meter. The manuals for the meters are kept in the meter box and members should become familiar with their operation.

17.7.2 The gas meters shall only be used by firefighting personnel who have been trained in its use.

17.7.3 The following is the procedure for use of the MiniCO meter

17.7.3.1 Turn on the MiniCO meter in fresh air.

17.7.3.2 Perform a Fresh Air Setup (FAS)

17.7.3.2.1 When the instrument is turned on, the display flashes "zero." While the "zero" is flashing, pressing the Zero button zeroes the instrument. The monitor will not zero out background concentrations greater than 5 ppm. If a concentration higher than this is detected, the instrument will display the actual concentration and not zero out the background.

17.7.3.3 Press the test button to check that the audible and visual alarms are working.

17.7.3.4 The CO meter should read zero.

17.7.3.5 Check calibration of the CO meter.

17.7.3.6 Let meter return to zero.

17.7.3.7 Meter is ready to measure.

17.7.4 The following is the procedure for use of the Orion Multigas meter.

17.7.4.1 Turn on the Orion Multigas Detector in fresh air.

17.7.4.2 Once the instrument self check is complete, the ZERO flag flashes for 10 seconds. Perform a Fresh Air Setup (FAS) by pushing the ON/OFF-PAGE button while the Zero flag is flashing.

17.7.4.3 The meter should read zero for all gases except O2 which should read ~20.8%.

17.7.4.4 Install sample probe.

17.7.4.5 Verify Pump Operation

17.7.4.5.1 Once gas readings are displayed, plug the free end of the sampling line or probe.

17.7.4.5.2 The pump motor shuts down and an alarm sounds and the pump indicator will illuminate. The readings on the display may change.

17.7.4.5.3 When the pump inlet, sample line or probe is blocked, the pump alarm must activate. If the alarm does not activate:

17.7.4.5.3.1 Check the pump, sample line, and probe for leaks.

17.7.4.5.3.2 Once the leak is fixed, recheck the pump alarm by blocking the flow.

17.7.4.6 4. Check the pump before each use.

17.7.4.7 Once the FAS is complete and pump is checked the meter is ready to measure.

17.7.5 The MiniCO meter reads CO and has a range of 0-999 ppm. It has a response time of 90 seconds to 90% of final reading. The meter alarm point is 35 ppm. Hydrogen gas is an interferant and 100 ppm of hydrogen will read ~56 ppm of CO.

17.7.6 The MiniCO meter calibration, batteries, spare battery and other equipment in the meter kit shall be checked at least once a month as part of the normal apparatus check.

17.7.7 The Orion Multigas meter reads CO, $H_2S$, LEL and. The CO range is 0-999 ppm. Hydrogen gas is an interferant and 100 ppm hydrogen will read ~70 ppm of CO. The $H_2S$ range is 0 to 200 ppm. The $O_2$ range is 0 to 25%. The combustible gas range is 0 to 100% LEL.

17.7.8 The Orion meter has a response time of 90% in 30 seconds (40 seconds for $H_2S$) plus 7 seconds for the sample line.

17.7.9 The Orion meter calibration, battery condition (It has rechargeable batteries), and other equipment in the meter kit shall be checked at least once a month as a part of the normal apparatus check.

17.7.10 The Orion LEL readings are calibrated to Pentane. For propane multiply the meter LEL reading by 0.8 and for unleaded gasoline multiply the meter LEL reading by 1.3.

17.7.11 The Orion meters have the following alarm set points:

| Gas | High Alarm | Low Alarm |
|---|---|---|
| CO | 35 PPM | |
| $H_2S$ | 10 PPM | |
| LEL | 10% LEL | |
| $O_2$ | 22.0% | 19.5% |

# 18. Propane Emergencies

18.1.1 Propane is a dangerous gas that is typically in a liquid form in propane cylinders and is a gas at normal atmospheric temperature and pressure. Firefighters on the first responding engine to a propane odor, leak or fire shall be qualified at the Hazardous Materials Operations level or greater. Firefighters on subsequent responding units shall be qualified at the Hazardous Materials Awareness level or greater. Any units responding with members that are not qualified at the Hazardous Materials Operations level or greater shall stage a minimum of 500' from the incident and wait for directions from Command.

18.1.2 Only Hazardous Material Technicians and Hazardous Material Operations with additional training in the hazards of propane level firefighters may enter the hazard zone or take action to shutoff the flow of propane. The hazard zone is defined as any area where the concentration of propane exceeds 10% of the lower flammable limit.

**18.2 Material Safety Data Sheets (MSDS)**

18.2.1 This section contains excerpts from a typical MSDS for propane. A complete copy of the MSDS is contained in the SOP Appendix as well as an MSDS for hydrogen.

**18.3 Excerpt From Typical MSDS**

18.3.1 Chemical Characteristics

18.3.1.1 Flash Point: –156º F, Auto ignition: 842º F, Ignition temperature in air: 920-1120º F.

18.3.1.2 Flammable limits in air by volume: Lower: 2.1%, Upper: 9.7%

18.3.1.3 Boiling point @ 14.7 psia = -44º F

18.3.1.4 Specific gravity of vapor (Air = 1) at 60° F: 1.50

18.3.1.5 Specific gravity of liquid (Water = 1) at 60° F: 0.504

18.3.1.6 Vapor pressure: @ 70° F = 127 psig; @ 105° F = 210 psig; @ 130°F = 287 psig

18.3.1.7 Expansion ratio (From liquid to gas @ 14.7 psia): 1 to 270

18.3.1.8 Solubility in water: Slight, 0.1 to 1.0%

18.3.1.9 Extinguishing agents: Dry chemical. $CO_2$, water spray or fog for surrounding area. Do not extinguish fire until propane source is shut off.

18.3.2 Appearance and odor: A colorless and tasteless gas at normal temperature and pressure. An odorant (ethyl mercaptan) is added to provide a strong unpleasant odor. Should a propane-air mixture reach the lower limits of flammability, the ethyl mercaptan concentration will be approximately 0.5 ppm in air.

18.3.2.1 Odorant warning: Odorant is added to aid in the detection of leaks. One common odorant is ethyl mercaptan, CAS No. 75-08-1. Odorant has a foul smell. The ability of people to detect odors varies widely. Also, the odor level can be reduced by certain chemical reactions with material in the propane system or when fugitive propane gas from underground leaks passes through certain soils. No odorant will be 100% effective in all circumstances.

18.3.3 Routes of exposure:

18.3.3.1 Inhalation: Asphyxiation. Before suffocation could occur, the lower flammability limit of propane in air would be exceeded, possibly causing both an oxygen-deficient and explosive atmosphere. Exposure to concentrations >10% may cause dizziness. Exposure to atmospheres containing 19% or less oxygen will bring about unconsciousness without warning. Lack of sufficient oxygen may cause serious injury or death.

18.3.3.2 Eye Contact: Contact with liquid can cause freezing of tissue.

18.3.3.3 Skin Contact: Contact with liquid can cause frostbite.

18.3.3.4 Skin Absorption: None.

18.3.3.5 Ingestion: Ingestion is not expected to occur in normal use. However, liquid can cause freeze burn similar to frostbite.

18.3.4 Special firefighting instructions: Evacuate all unnecessary personnel from the area. Allow only properly trained and protected emergency response personnel in area. A NIOSH approved self-contained breathing apparatus may be required. If gas flow cannot be shut off, do not attempt to extinguish fire. Allow fire to burn itself out. Use high volume water supply to cool exposed pressure containers and nearby equipment. Approach a flame-enveloped container from the sides, never from the ends. Use extreme caution when applying water to a container that has been exposed to heat or flame for more than a short time. For uncontrollable fires and/or when flame is impinging on container, withdraw all personnel and evacuate vicinity immediately.

18.3.5 Unusual fire and explosion hazards: Propane is heavier than air and can collect in low areas. Flash back along a vapor trail is possible. Pressure in a container can build up due to heat; and, container may rupture suddenly and violently without warning if pressure relief devices fail to function properly. If flames are against the container, withdraw immediately on hearing a rising sound, if venting increases in volume or intensity or if there is discoloration of the container due to fire. Propane released from a properly functioning relief valve on an overheated container can also become ignited.

18.3.6 LP gas (propane or butane) is colorless, treated with an odor detector, heavier than air -- settles and may be more predominant in the lower levels of a structure. Caution if the structure has strong air currents. As an example, up open stairways or stud channels as may happen in a wood frame balloon constructed building. The vapors may also be found in the upper levels as well as the lower. Remember that L.P.G. is heavier than air, so avoid low lying areas and do not approach from a down hill direction.

18.3.7 Hazardous combustion products: None.

## 18.4 Operational Procedures at Liquefied Petroleum Gas Leaks and Fires

18.4.1 Initial Actions

18.4.1.1 Using the gas meter attempt to determine the hazardous area (flammable vapor area).

18.4.1.2 Propane is heavier than air, so avoid low-lying areas and do not approach from a down hill direction.

18.4.1.3 Give a report on conditions, and request additional equipment, special equipment and gas company representatives as needed.

18.4.1.4 Determine if rescue or evacuation problems exist.

18.4.1.5 Formulate Incident Action Plan (IAP) based on initial size-up.

18.4.1.6 The IAP must provide for:

18.4.1.6.1 Safety of citizens and firefighters.

18.4.1.6.2 Evacuation of endangered area if necessary.

18.4.1.6.3 Control of situation.

18.4.1.6.4 Stabilization of the spilled or leaking material.

18.4.2 Safety

18.4.2.1 Avoid commitment of personnel and apparatus until a complete size-up has been made.

18.4.2.2 All personnel shall be in full protective clothing. All personnel involved in confining, containing, or controlling the release shall be wearing SCBAs.

18.4.2.3 For a small container leak keep all unnecessary personnel and bystanders a minimum of 330' from the hazard area. For a large leak keep all unnecessary personnel and bystanders a minimum of one-half mile from the hazard area. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1 mile in all directions; also, consider initial evacuation for 1 mile in all directions

18.4.2.4 Remove all ignition sources in the hazardous area. This may mean closing roads and highways.

18.4.2.5 Keep clear of tank ends if fire is impinging on the tank.

18.4.2.6 During LPG tank fires, if whistling from pressure relief valve becomes progressively louder, evacuate the area immediately, explosion is imminent.

18.4.2.7 If tank is burning, fire streams must be used to cool the vapor area of the tank (area above liquid level).

18.4.2.8 Do not extinguish tank or cylinder fires unless shut-off can be effected.

18.4.2.9 Use at least two crews with fog streams to protect firefighters attempting to close the valves or effecting the shut-off.

18.4.2.10 If a LPG tanker has been involved in an accident with significant damage or rolled over the relief valve may be inoperable.

18.4.2.11 Do not park apparatus in low area - flammable vapors may have accumulated there.

18.4.3 Confinement

18.4.3.1 If vapor is leaking use fog streams to protect exposures and direct vapor cloud.

18.4.3.2 If ignition has occurred, use streams to protect the container from over heating and protect exposures from radiant and convection heat.

18.4.4 Control

18.4.4.1 Approach the fire or leak from upwind.

18.4.4.2 Use heavy fog streams to dissipate the vapors if possible without disturbing the liquid.

18.4.4.3 Disperse vapor to safe location.

18.4.4.4 Attempt to shut off leak by shutting off valves or crimping lines.

18.4.4.5 Heavy streams should be used to divert flames from exposures.

18.4.4.6 Apply heavy streams to all areas of the tank exposed to heat.

18.4.4.7 The controlled burning of escaping LP Gas (which cannot be shut off by closing a valve) is a commonly accepted firefighting practice.

18.4.5 Structure Ventilation

18.4.5.1 If propane concentration is above the upper flammable limit it will pass through the flammable range before it reaches the lower flammable limit.

18.4.5.2 Turn off all possible ignition sources.

18.4.5.3 Use natural ventilation by opening doors and windows

18.4.5.4 If mechanical ventilation is necessary use the electric fan approved for use in hazardous areas and in positive pressure configuration.

# 19. Gasoline and Diesel/Fuel Oil Emergencies

19.1.1 Gasoline is a dangerous liquid and has a very low flashpoint. Firefighters on the first responding engine to a gasoline leak or fire shall be qualified at the Hazardous Materials Operations level or greater. Firefighters on subsequent responding units shall be qualified at the Hazardous Materials Awareness level or greater. Any units responding with members that are not qualified at the Hazardous Materials Operations level or greater shall stage a minimum of 500' from the incident and wait for directions from Command.

19.1.2 Only Hazardous Material Technicians and Hazardous Material Operations with additional training in the hazards of gasoline level firefighters may enter the hazard zone or take action to shutoff the flow of gasoline. The hazard zone is defined as any area where there is a pool of gasoline or where the concentration of gasoline vapor exceeds 10% of the lower flammable limit.

**19.2 Material Safety Data Sheets (MSDS)**

19.2.1 This section contains excerpts from typical MSDSs for unleaded gasoline, No. 1 diesel fuel and No. 1 fuel oil. Completes copies of the MSDSs are contained in the SOP Appendix as well as MSDSs for E85 ethanol/gasoline blend and B20 diesel fuel/vegetable oil blend.

**19.3 Excerpt From Typical Gasoline MSDS**

19.3.1 Gasoline is a complex and variable mixture that originates from finished refinery streams. These streams can contain the hydrocarbons and oxygenated chemicals (oxygenates) that are regulated or are associated with certain potential health effects. The typical concentration of oxygenates in gasoline does not exceed 18%.

19.3.2 Chemical Characteristics

19.3.2.1 Flash Point: –45º F, Auto ignition: 536º F

19.3.2.2 Flammable limits in air by volume: Lower: 1.4%, Upper: 7.6%

19.3.2.3 Specific gravity of vapor (Air = 1) at 60° F: 3 to 4

19.3.2.4 Specific gravity of liquid (Water = 1) at 60° F: 0.72 to 0.77

19.3.2.5 Boiling Range: 100 to 400º F

19.3.2.6 Solubility in water: Hydrocarbon components of gasoline are slightly soluble in water. Oxygenate components, such as MTBE, are more soluble than the hydrocarbon components. Ethanol has greater solubility in water than hydrocarbon components or other oxygenate components.

19.3.2.7 Extinguishing agents:

19.3.2.7.1 SMALL FIRE: Use dry chemicals, carbon dioxide, foam, or inert gas (nitrogen). Carbon dioxide and inert gas can displace oxygen. Use caution when applying carbon dioxide or inert gas in confined spaces.

19.3.2.7.2 LARGE FIRE: Use foam, water fog, or water spray. Water May Be Ineffective. Water may not extinguish the fire. Water fog and spray are effective in cooling containers and adjacent structures. However, water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.

19.3.3 Protection of Firefighters: Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential

hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities of potential fire and explosion hazard if liquid enters sewers or waterways.

19.3.4 Special Properties: Flammable Liquid! This material releases vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, its vapor can cause a flash fire. Use only with adequate ventilation. Vapors are heavier than air and may travel long distances along the ground to an ignition source and flash back. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous Combustion Products: Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons, aldehydes and other products of incomplete combustion.

19.3.5 Accidental Release Measures: Flammable Liquid! Release causes an immediate fire or explosion hazard. Evacuate all non-essential personnel from immediate area and establish a "regulated zone" with site control and security. A vapor-suppressing foam may be used to reduce vapors. Eliminate all ignition sources. All equipment used when handling this material must be grounded. Stop the leak if it can done without risk. Do not touch or walk through spilled material. Remove spillage immediately from hard, smooth walking areas. Prevent spilled material from entering waterways, sewers, basements, or confined areas. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to appropriate waste containers. Use clean, non-sparking tools to collect absorbed material. For large spills, secure the area and control access. Prevent spilled material from entering sewers, storm drains, other drainage systems, and natural waterways. Dike far ahead of a liquid spill to ensure complete collection. Water mist or spray may be used to reduce or disperse vapors; but, it may not prevent ignition in closed spaces. This material will float on water and its run-off may create an explosion or fire hazard. Verify that responders are properly HAZWOPER-trained and wearing appropriate respiratory equipment and fire-resistant protective clothing during cleanup operations. In an urban area, cleanup spill as soon as possible; in natural environments, cleanup on advice from specialists. Pick up free liquid for recycle and/or disposal if it can be accomplished safely with explosion-proof equipment. Collect any excess material with absorbant pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal. Comply with all applicable local, state and federal laws and regulations.

**19.4 Excerpt From Typical Diesel Fuel MSDS**

19.4.1 Chemical Characteristics

19.4.1.1 Flash Point: 100º F, Auto ignition: 489º F

19.4.1.2 Flammable limits in air by volume: Lower: 0.7%, Upper: 5%

19.4.1.3 Specific gravity of vapor (Air = 1) at 60° F: 4

19.4.1.4 Specific gravity of liquid (Water = 1) at 60° F: 0.82

19.4.1.5 Boiling Range: 302º F

19.4.1.6 Solubility in water: Very slightly soluble in cold water.

19.4.1.7 Extinguishing agents:

19.4.1.7.1 SMALL FIRE: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen).

19.4.1.7.2 LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.

19.4.1.8 Protection of Firefighters: Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities of potential fire and explosion hazard if liquid enter sewers or waterways.

19.4.2 Special Properties: Combustible Liquid! This material releases vapors when heated above ambient temperatures. Vapors can cause a flash fire. Vapors can travel to a source of ignition and flashback. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. Use only with adequate ventilation. If container is not properly cooled, it can rupture in the heat of a fire.

19.4.3 Accidental Release Measures: Combustible Liquid! Release can result in a fire hazard. Evacuate all non-essential personnel from release area. Establish a regulated zone with site control and security. Eliminate all ignition sources. Stop the leak if it can done without risk. A vapor-suppressing foam may be used to reduce vapors. Properly bond or ground all equipment used when handling this material. Avoid skin contact. Do not walk through spilled material. Verify that responders are properly trained and wearing appropriate personnel protective equipment. Dike far ahead of a liquid spills. Do not allow released material to entry waterways, sewers, basements, or confined areas. This material will float on water. Absorb or cover with dry earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material. Place spent sorbent materials, free liquids and other clean-up debris into proper waste containers for appropriate disposal. Certain releases must be reported to the National Response Center (800/424-8802) and state or regulatory authorities. Comply with all laws and regulations.

**19.5 Operational Procedures at Gasoline/Fuel Oil Leaks and Fires**

19.5.1 Initial Actions

19.5.2 1. When approaching area, slow down or stop if necessary to assess any visible action taking place. It may be necessary to “stage” incoming units away from the scene.

19.5.2.1 Use the gas meter to assist in determining the hazardous area (flammable vapor area).

19.5.2.2 Give a report on conditions, and request additional equipment, special equipment and gas company representatives as needed.

19.5.2.3 Determine if rescue or evacuation problem exists.

19.5.2.4 Formulate Incident Action Plan (IAP) based on initial size-up.

19.5.3 The IAP must provide for:

19.5.3.1 Safety of citizens and firefighters.

19.5.3.2 Evacuation of endangered area if necessary.

19.5.3.3 Control of situation.

19.5.3.4 Stabilization of the spilled material.

19.5.4 Safety

19.5.4.1 Avoid commitment of personnel and apparatus until a complete size up has been made.

19.5.4.2 All personnel shall be in full protective clothing. All personnel involved in confining, containing, or controlling the release shall be wearing SCBAs.

19.5.4.3 For a large spill consider initial downwind evacuation for at least 1,000 feet. If tank, rail car or tank truck is involved in a fire, ISOLATE for one-half mile in all directions.

19.5.4.4 Remove all ignition sources in the hazardous area. This may mean closing roads and highways.

19.5.4.5 Some flammable liquids give of toxic vapor whether they are burning or not.

19.5.4.6 If flammable liquid is leaking from burning tank keep clear of the container ends.

19.5.4.7 In the case of a tank fire, fire streams must be used to cool the vapor area of the tank (area above liquid level).

19.5.4.8 If personnel must operate in a precarious position, they must be protected with another fire stream.

19.5.4.9 Do not park apparatus in low areas - flammable vapors may have accumulated there.

19.5.5 Confinement

19.5.5.1 Isolate the spill by the use of dikes and absorbent materials.

19.5.5.2 Spill fires which are flowing to an area where they can burn safely should be allowed to do so.

19.5.5.3 Direct spill away from exposures.

19.5.5.4 The biggest problem with spills is containment of spilled material; the more water you add, the larger the containment problem becomes.

19.5.6 Control

19.5.6.1 Use fog streams to dissipate the vapors if necessary, and possible, without disturbing the liquid.

19.5.6.2 Determine if water can be used based on specific gravity of the spilled material.

19.5.6.3 The use of Class B foam can prevent ignition of or extinguish spilled material. See SOP section on Foam Use.

19.5.6.4 Attempt to shut-off leak - shutting off valves, plugging container.

19.5.6.5 Heavy streams can be used to divert flames from exposures. Burning fuel must be flushed from under and around tanks.