Industrial and Municipal Fire Department Interface

BY CRAIG H. SHELLEY

In many instances, the public will open the morning newspaper or turn on the evening news and see photos of a large industrial fire that had taken place or is still ongoing. What the public doesn’t see is the interface between the municipal fire department and the industrial fire department/brigade. This takes place behind the scenes and out of the camera angle and hopefully is a seamless process. The similarities and differences between the municipal and industrial fire departments in procedures, duties, equipment, and skills can affect this interface either positively or negatively. However, by working together and developing partnerships, municipal fire departments and industrial fire brigades can cooperatively achieve the end goal of protection of life and property.

ORGANIZATION AND PERSONNEL

Most municipal fire departments adhere to a semimilitary organizational structure, usually led by a fire chief who reports to a mayor or city manager. Industrial fire departments or brigades may be full-time departments and also have a semi-military organizational structure with the fire chief reporting to senior plant management, usually within the health and safety group or organizational line. Industrial fire brigades may also be comprised of industrial facility employees trained to perform basic firefighting operations. Providing fire suppression and related services may or may not be a full-time occupation for these employees. In many cases they will perform other duties for their employer such as plant maintenance or operations and fulfill the firefighting role during emergencies at the plant.

The industrial fire brigade's organizational structure and operational duties may be similar to those of the municipal fire department, including inspection functions. Management must outline not only the specific duties that an industrial fire brigade can perform but also what duties it shall not perform.

The brigade must also possess the knowledge and skills associated with these firefighting operations. National Fire Protection Association (NFPA) 600, Standard on Industrial Fire Brigades, contains the “minimum requirements for organizing, operating, training, and equipping industrial fire brigades.” It also outlines the minimum requirements for the occupational health and safety of the industrial brigade member while performing firefighting and related tasks. In some cases, the industrial fire brigade may be referred to as the Emergency Response Team, Plant Emergency Response Team, the Fire Team, the Emergency Brigade, or another suitable name.

NFPA 600 outlines the limitations of the industrial fire brigade during fire suppression activities. Industrial fire brigades may be restricted to performing one of the following firefighting functions: incipient firefighting, advanced exterior firefighting, interior structural firefighting duties only, or advanced exterior and interior structural firefighting duties. As noted above, not all industrial fire departments or brigades are capable of performing all firefighting functions and duties. Municipal fire departments must be aware of the limitations of the industrial fire brigades that may respond on mutual aid, automatic aid, or normal response assignments. Knowing the brigade’s qualifications and limitations will assist with the preincident planning required to successfully mitigate an incident at the industrial facility. Information on the staffing levels and the support the industrial brigade can offer the municipal department should be included in the preincident response plans. In addition, when the municipal department responds to an incident at an industrial facility, the information regarding the attending brigade's qualifications will be useful in determining staffing assignments in the incident command system. Certain members of an industrial brigade who are not qualified to perform offensive actions can still assist in support roles, freeing municipal department members for critical assignments.

NFPA 1081

The NFPA has also developed NFPA 1081, Standard for Industrial Fire Brigade Member Professional Qualifications, which identifies the minimum job performance requirements necessary to perform the duties of an individual who is a mem-

(1) SCBA training may be taught to municipal and industrial firefighters. Municipal fire departments can also share rapid intervention team techniques with industrial fire departments. (Photo courtesy of Michael Barrett.)
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Joint training sessions that exercise and reinforce mutual aid, automatic aid, or initial response duties for the industrial brigade and the municipal department should be conducted frequently. Municipal fire departments with industrial facilities within their response areas should take advantage of training opportunities at the industrial fire schools available throughout the United States. Although many municipal departments frequently take advantage of their state, county, or regional fire schools, not many take advantage of an industrial school. The Louisiana State University Fire and Emergency Training Institute in Baton Rouge and the Texas Engineering Extension Services (TEEX) facility at Texas A&M University in College Station are two facilities that offer excellent industrial training. With liquefied natural gas (LNG) becoming a major concern for many departments, the Massachusetts Firefighting Academy in Stow as well as the TEEX facility offer excellent hands-on courses in LNG firefighting.

Many industrial fire schools offer training to industrial brigades throughout the year. Fostering a municipal/industrial fire service partnership could lead to sharing classroom seats when each department attends classes specializing in the others' areas of expertise. When the industrial brigade attends an industrial fire school, it could allot a few seats for municipal department members, and vice versa. Municipal departments should consider attending industrial academies on a scheduled rotational basis, concentrating on the particular hazards they may encounter at local industrial facilities.

On visits to local industrial facilities, municipal fire department personnel should contact on-site brigade and emergency response team leaders, discussing special firefighting considerations with these and other plant operations personnel as well as the roles each department will play during such an incident.

During this visit, the municipal department should bring a copy of the current preincident response plan for updating (photo 2). Review the plan with the plant personnel and update as needed contact numbers, firefighting equipment available and needed, plant personnel responsibilities, and so forth. In particular, review and verify access routes. Has the plant altered access because of security concerns? Regarding security, any preincident response plans should be included in the fire department's operational security planning. Preincident response plans should not be accessible to the general public but kept in a locked container or compartment on the fire apparatus. If they are included in on-board computer databases, these databases should be password protected, and the passwords should be changed frequently. After updating the plans, the old hard copies should be shredded. Remember, anyone can go through the trash outside the fire station.

Preincident response plans should contain an organizational chart, with photos of the key players. This will be valuable during emergency response,
allowing municipal fire commanders to rapidly identify these key players on-scene.

**SHARING RESOURCES**

After training, consider the resource partnership. In today's climate of fiscal restraint, many industrial organizations and municipal jurisdictions want to save money, and fire protection is one of the areas that is evaluated and in many cases trimmed. Sharing resources and eliminating service duplication are areas in which a department or brigade can add value to its service delivery. Other services not already present may also be added. Some of these shared resources may include the following:

- Hazardous materials teams.
- Special operations teams.
- Incident management overhead teams.
- Confined space and technical rescue teams.
- Logistical and equipment support.

In many instances, there may be mutual-aid agreements among several industrial facilities so that in a large-scale emergency, additional resources can be called in to assist. This is particularly true in the petrochemical industry, where an emergency incident may require large quantities of foam and large-capacity appliances to apply it. Municipal fire departments should identify these resources and maintain agreements whereby these resources could be used in the municipal arena where applicable and necessary, as well as technical assistance.

In New Jersey, the state fire marshal's office, the state industrial mutual-aid organization, and municipal entities formed a partnership to share resources in a large-scale disaster or incident. The resources can be accessed through the County Fire Coordinators' resource database. The County Fire Coordinators can share this information electronically and can update the inventories daily if necessary. Equipment and personnel that can be accessed and shared under this partnership are as follows:

- 20 foam pumpers;
- 20,000 gallons of foam concentrate;
- 18 hazardous materials teams;
- 10 technical rescue teams; and
- numerous subject matter experts.

**TACTICAL DIFFERENCES**

At industrial incidents, there may be tactical differences between municipal and industrial firefighting, such as a non-intervention mode. At industrial incidents, it may be necessary to evacuate the area and enter into a nonintervention mode where the risk/benefit analysis indicates that the potential costs far outweigh any benefits. Such a situation may be indicated in boiling-liquid, expanding-vapor explosion or tank boilover situations. We do not want to place our emergency or other support personnel at an unacceptable risk. It may be difficult strategy for municipal firefighters to accept, but safety may dictate its use.
Municipal firefighters should also be aware that the cooling of exposures will be an essential part of operations. Initial operations may include this tactic while the fire is allowed to burn. During this period, plant operations personnel will be attempting to block in and shut down systems. At industrial incidents, plant operators may have to perform these actions sequentially and in coordination with other areas of the plant or other plants so that these other areas or facilities are not affected. The large amounts of combustible liquids and gases sent to flare may alarm the municipal firefighter. The sounds and visual effects may be alarming, but this is much safer than allowing the product to spill onto equipment or the ground. Cooling is essential to ensure that supporting structures do not collapse and create additional problems such as leaking products, which can increase the fire's intensity or spread it.

During tactical operations, close coordination among the municipal department, the industrial brigade, and the plant operations personnel is essential. Without this close cooperation, the actions of one entity can have serious implications for the firefighting effort. It should also be noted that the organizational structure of the plant may designate an operations supervisor as the incident commander (IC). Preincident response plans should highlight this. After the arrival of the municipal department, who will be in command? Will there be a seamless transition to a unified command structure? Unified command is usually required when more than one agency will share responsibility for the successful mitigation of the incident. This will be especially true when the incident is extending or threatening to extend beyond a facility's property line.

Some of the key plant operations personnel who need to be located and consulted at an industrial incident may include the plant manager, the hazardous materials specialists, and the process unit supervisor. These people will have the knowledge and experience to assist the fire department in isolating power and fuel sources to process or manufacturing operations and provide the IC with the necessary technical information.

The basic tactical priorities necessary for successfully mitigating municipal incidents also apply at industrial incidents; life hazard/rescue, extension prevention, incident confinement, and extinguishment. For industrial incidents, the extension prevention may include underground systems such as sewer systems.

**EQUIPMENT**

Municipal fire departments and industrial fire brigades use equipment designed to address the specific hazards in their respective jurisdictions. Industrial fire brigade equipment may be a lot larger than that of its municipal counterpart because of the nature of the hazards encountered. For instance, the average municipal pumper's capacity may be 1,500 gallons per minute (gpm), whereas that of an industrial brigade pumper may be 4,000 gpm and larger. In addition, these large-capacity industrial pumpers may carry large quantities of...
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Foam concentrate, up to 2,500 gallons. Other specialized industrial brigade equipment includes apparatus such as foam tankers that can transport and pump foam concentrate or solution. In addition to large-capacity pumpers, industrial sites may also have large-capacity portable pumps and water or foam solution delivery devices. Monitor nozzles capable of delivering up to 15,000 gpm as portable devices or 4,000 gpm as an apparatus-mounted appliance can be found in industrial applications. In the 1960s, the Fire Department of New York (FDNY) operated the Super Pumper, which could pump 8,800 gpm. Today, for large-scale incidents, the FDNY uses the maxi-water system, which is a series of five 2,000-gpm pumpers with hose tenders carrying large-diameter hose (LDH).

Imagine what municipal departments could do with large industrial pumpers strategically placed within their jurisdiction for large-scale fires, including industrial responses. Municipal departments that respond to industrial facilities should be cross-trained on this large-capacity equipment and be ready to operate it when necessary.

To supply the large quantities of water required at industrial incidents, industrial facilities may have large-capacity water systems. These water systems may pump more than 12,000 gpm and operate at higher pressures than the municipal department encounters on a daily basis. A municipal fire water system may have static pressures as low as 25 pounds per square inch (psi), whereas an industrial facility may have static pressures as high as 170 psi. Is your pump operator/driver familiar with the operating procedures with these higher pressures? The pumper in this case may be used to reduce the pressures encountered.

LDH will also be used in quantity at industrial facilities. Most municipal departments use four- or five-inch LDH. Industrial departments are presently using six-; 7 3/4-; or, in newer instances, 12-inch hose. Does your department have the fittings and adapters it needs to connect to these hose and associated delivery appliances? In one large industrial fire, a mutual-aid municipal
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(3) Jet ratio controllers. (Photo by author.)

plant personnel, and written documents (e.g., plant drawings and material safety data sheets).

By working together and developing partnerships, the municipal-industrial interface will be a seamless boundary, with both entities working in harmony to achieve the end goal of protection of life and property.

ENDNOTES


2. NFPA 600, sections 1.4.3—1.4.6.


5. A flare is the area where controlled burning of a high vapor pressure liquid or compressed gas takes place to reduce or control the pressure or dispose of the product.

CRAIG H. SHELLEY, EFO, CFO, CFPS, is a 40-year veteran of the fire service. He has served in volunteer fire/EMS, career municipal, and career industrial fire departments. He served for 26 years with the Fire Department of New York (FDNY), retiring as the chief of marine operations. Shelley is an adjunct associate professor for the University of Maryland University College, teaching its Managerial Issues in Hazardous Materials and Advanced Fire Administration courses, and also serves as an adjunct associate professor for Charter Oak State College, teaching strategic planning. He is a fire protection advisor with a major oil company operating in the Middle East. He has a bachelor of science degree in fire service administration and a master of science degree in executive fire service leadership. He is a frequent contributor to industry trade publications, speaks at national and international conferences, and is a co-author of Industrial Firefighting for Municipal Firefighters (Fire Engineering, 2007).

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