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IN THIS ISSUE

- 3 Online course: Financial Systems Management for Fire and EMS Agencies
- 4 Changing residential fire dynamics and what it means to firefighter operations
- 5 Canadian News
- 6 Shared Services - A new buzz word?
News You Can Use
- 8 National Fallen Firefighters Memorial Weekend set for Oct. 5-6

INSERT

EMPLOYMENT PRACTICES UPDATE

Workplace discrimination based on language and accents

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When an aerial test is not enough!

What fire departments need to understand about aerial device testing requirements

By T. Randy Hess, Director VFIS Risk Control Services

Aerial devices can be critically important pieces of apparatus to fire departments. However, it is important to understand the testing requirements. Several questions could arise such as when is an NFPA compliant aerial test not sufficient for an aerial device? Do all aerial testing companies that offer NFPA testing perform the same test? Why might an aerial test certificate be inadequate?

An aerial device is considered any one of several types; sectional ladder, elevated platform or articulating boom. Not only is the aerial apparatus different in size compared to other types of apparatus, it has also a different mechanical function.

Once an aerial device is placed into service, it is important to be aware of the requirements for testing the device. There are several common causes of loss for the devices. First is metal fatigue; second is improper and/or lack of proper maintenance. Vibration from road travel will eventually cause metal fatigue to the aerial device, which is why aerial testing is so important. Subject to the useable lifetime of the aerial device and keeping in mind that the mere use of the aerial causes metal fatigue, both of these causes of loss may be preventable. However, in order to prevent metal fatigue and maintenance losses and provide for the safe operation, conduct scheduled testing in conjunction with routine maintenance. In addition, it would be remiss to overlook the fact that another major cause of loss to aerials is operator error (overlooking, etc.), which requires driver training and is beyond the scope of this article.

While there are specific NFPA Standards for the tests and test procedures, there are no industry standards for testing service provider disclosures or how they report their findings. NFPA 1911, Standard for Inspection, Maintenance, Testing, and Retirement of In-Service

Continued on page 2



Automotive Fire Apparatus, 2012 Edition Chapter 19, Performance Testing of Aerial Devices governs the process and procedures for aerial testing and requires two levels of testing for aerial devices; annual testing and nondestructive testing.

Annual testing may be conducted by any qualified individual (as defined in NFPA 1911) once a year. This test is essentially a visual inspection and a documented operational test.

Nondestructive testing (NDT),

sometimes referred to as a five-year nondestructive test, must be conducted by a qualified and certified Level II NDT Technician as defined by the American Society of Nondestructive Testing CP189. NDT is a general term for one of a number of different methods that can be used to inspect the aerial device's structural components without physically altering or damaging the materials. These could include, but are not limited to, liquid penetrant inspection, magnetic particle inspection, radiography, metal hardness and ultrasonic testing. When properly conducted, the tests are designed to detect metal fatigue, cracks or deformities in the frame, ladder, ladder rails, turntable, outrigger, bolts or any other critical metal structural component. **These tests must be conducted at least every five years AND whenever the aerial device has been damaged or stressed beyond normal limits.**

A majority of fire departments that own aerial devices understand that NFPA requires testing. However, there may be confusion and misunderstanding of what is mandatory. The NFPA Standard and VFIS both require that: (i) a successful NDT test is completed at least every five

years for any aerial device; and (ii) the annual test is conducted every year, including the years that a nondestructive test is completed. The NDT is a supplemental test, not a substitute test.

A mistake may happen when departments request that a testing company test their aerial device to meet NFPA Standards such as:

- *An annual test may be conducted when the NDT is needed.*
- *The testing company may only be qualified to conduct an annual test.*
- *They may advertise that they conduct NFPA compliant tests but do not identify whether this was an annual or NDT.*
- *If a fire department doesn't ask, the testing company isn't required to tell that they are not conducting an NDT, since an annual test meets NFPA Standards as well.*

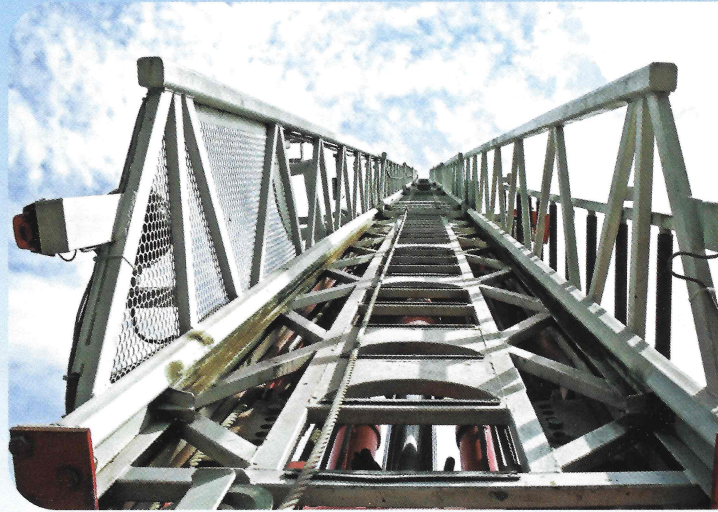
Fire departments are responsible to know what test is required, when it's required and for making certain the testing service provider conducts it.

ESOs should be aware of potential serious problems a fire department may face when purchasing a used aerial device. VFIS claims history shows that aerial device failure is not uncommon and the risk of failure increases as the unit ages, particularly in units more than 20 years old. Some of the most common reasons for selling an aerial device are aging parts and un-repaired damage. Before purchasing a used aerial device, hire a reliable third party testing company to conduct a nondestructive test and provide the results. If the aerial doesn't pass the test, weigh out the cost of repairs and re-certification before driving the device home. Also, be cautious if the seller offers a test certificate. When a testing company provides a test certificate it may or may not indicate what kind of test has been completed. Some certificates indicate that a test was conducted that met NFPA 1911 Standards but does not specify what part of the standard was met. Others may show that the certificate is good for one year, but does not indicate what test was conducted. There are also times when a certificate is not available, which could generally mean the aerial did not pass the test and needs repairs.

Continued top of page 3

Confused yet? To simplify some of this confusion follow these basic steps with regard to aerial device maintenance and testing:

- 1. Whether new or used, follow the manufacturer's recommendations closely with regard to maintenance. Clean and well maintained aerial devices don't typically wear out as fast as those that aren't maintained. An often overlooked part of this maintenance is the budget. It is recommended to incorporate enough money into the budget each year to keep up with the service of the vehicle and the aerial device mounted to it.*
- 2. Have the NFPA annual test conducted every year as recommended in the NFPA 1911 Standard.*
- 3. Have the nondestructive test conducted every five years in conjunction with the annual test.*
- 4. When contracting for testing services, be clear on which test to perform, annual or nondestructive or both, and ask if they are capable of conducting both of those tests.*
- 5. Consider having an annual and nondestructive test conducted prior to purchase the device. Obtain a copy of the test report(s) and a certificate indicating that the device passed the nondestructive and annual test.*
- 6. If the aerial device is unusually stressed during emergency operations or training or the device is damaged, have a full test conducted prior to placing the aerial back into service.*



Remember that these are basic steps and may not cover every situation when purchasing or maintaining an aerial. Even when following the best precautions, there are additional risks and concerns associated with purchasing a used aerial device such as a seller's contractual disclaimer. VFIS is among several organizations actively involved in attempting to bring standardization to the reporting requirements and disclosures that federal and state agencies promulgate to help eliminate some of these problems.

Keeping up with the required maintenance and the proper testing of the aerial device are the two most effective ways to help greatly reduce the risk of a catastrophic failure of an aerial device. ♻️

Please contact VFIS Risk Control Services with any questions or concerns on the topic of aerial devices or testing and reporting requirements.