NFSA The Voice of the Fire Sprinkler Industry

TechNotes

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Hose Stream Demands – Part 1

Here at the NFSA, we answer more than 2600 technical questions from out members each year through our Expert of the Day (EOD) service. We monitor the subjects that people are asking about in order to determine subjects that we should develop more training materials about. We figure that if multiple people from different places ask similar questions, then that subject could use some clarification.

The subject for this issue of e-TechNotes comes from this review process. We've noticed a number of questions in the last 30 days regarding hose stream demands that indicate that we need to spend a little time discussing them to clear up some misconceptions.

The purpose of the hose stream demand is to make sure that the fire department has the ability to put some hose in service when they arrive on the scene of a fire without taking flow away from the fire sprinkler system inside the building. Fire sprinkler systems don't always completely put out the fire on their own. While the sprinklers control the fire, confining its damage to the area or object of fire origin, we rely on the fire department for final extinguishment. But we don't want the fire department to turn off the sprinklers, or to take flow away from the sprinkler system that it needs while they do this final extinguishment.

Therefore, when the water supply that the fire department is going to use for their hose streams and the water supply for the sprinkler system are the same, we add a small amount of flow to the fire sprinkler system calculations to account for the water that the fire department will be using at the same time that the sprinkler system is working. The amount of flow that we add depends on the hazard classification of the building and the commodity being stored if it is a warehouse.

In the 2013 edition of NFPA 13, the hose stream demands are summarized in Table 11.2.3.1.2 for Light, Ordinary and Extra Hazard occupancies. Table 12.8.6.1 in the 2013 edition summarizes the hose stream demand for most storage situations (special commodities still have the ability to have their own demands listed in the storage chapters). For editions of NFPA 13 prior to 2013, there is a similar table in Chapter 11 but the hose stream demands for storage were scattered throughout Chapters 12 through 21.

If the fire sprinkler system is fed from a different water supply than the one that the fire department will be using, then no hose stream demand is required to be added to the sprinkler system calculations. For example, if the sprinkler system is fed from a tank with a pump and there are no outlets on the tank that the fire department can connect to and there are no private hydrants connected to the tank or pump, then the hose stream demand is not required to be added to the sprinkler system demand and the pump and tank can be sized for only the sprinkler demand.

Total Inside and Outside Hose

The hose stream demand generally ranges from 100 gpm to 500 gpm. This is the total amount that is intended to be available to the fire department both inside and outside the building. For the fire department to use hose inside the building, they either need a connection inside the building or they need to connect the hose outside and drag it into the building. Since the hydraulic calculations are only concerned with where the water needs to be added, we will discuss “inside hose connections” as those outlets that are physically in the building to be used for fire fighting and “outside hose connections” as the public or private hydrants that the fire department will use outside of the building.

The hose stream demand is always a flow that is added to the sprinkler system demand at the appropriate connection at whatever pressure the sprinkler system needs at that point. The hose stream demands do not guarantee that the fire department will have any specific pressure. The fire department brings their own pressure source with them (a fire truck with a pump on it). So, the purpose of the hose stream demand is to make sure that the water supply can deal with the extra flow demand.

Inside Hose Demand

Section 11.1.6.3 and section 12.8.4 provide the rules for inside hose demand. In a building with no inside hose connections, the inside hose demand is 0 gpm. In a building with only one inside hose connection, the inside hose demand is 50 gpm. In a building with two or more inside hose connections, the inside hose demand is 100 gpm with 50 gpm added to each of the two most demanding inside hose connection at the point where they connect to the sprinkler system piping at whatever pressure is needed by the sprinkler system at that point.

It is important to note here that the inside hose connections in question here are not standpipes. A standpipe system that is designed in accordance with NFPA 14, whether it is a Class I system with 2-1/2 inch connections or a Class II system with 1-1/2 inch connection or a Class III system with both will have its own water supply and its own calculations. These calculations will be independent of the fire sprinkler system and the sprinkler demand does not need to be added to the standpipe demand as long as the building is fully sprinklered. If the building is partially sprinklered some of the sprinkler demand may be needed to be added to the standpipe demand, but that is the subject of a whole different discussion.

It is not very common to find inside hose stations these days. Most buildings are not required to have such connections. There was a time when NFPA 13 required inside hose connections in storage warehouses, but even that has changed more recently. The 2013 edition of NFPA 13 only requires hose connections in storage occupancies, "where required by the authority having jurisdiction" (see section 12.2.1). In the vast majority of buildings that have no inside hose connections, the inside hose demand will be 0 gpm.

There was one edition of NFPA 13 where the annex implied that the 50 gpm inside hose demand should be added to the standpipe connections in a building with a standpipe systems (see section A.11.1.5.6 in the 2007 edition of NFPA 13). But this section was reviewed by the committee in the next cycle and it was removed for the 2010 and subsequent editions. Since the statement was in the annex rather than the body of the standard, it was never legally enforceable and it contradicted the body of both NFPA 13 and NFPA 14 with respect to water supplies for combined sprinkler and standpipe systems.

Outside Hose Demand

The Outside Hose Demand is calculated by taking the Total Hose Demand and subtracting the Inside Hose Demand for the building. The following table provides the Outside Hose Demand for a variety of occupancies.

Occupancy	Total Inside and Outside Hose Demand	Inside Hose Demand	Outside Hose Demand
Light Hazard with no hose connections	**100**	**0**	**100**
Light Hazard with 2 or more inside hose connections	**100**	**100**	**0**
Ordinary Hazard with no hose connections	**250**	**0**	**250**
Ordinary Hazard with 2 or more hose connections	**250**	**100**	**150**
Storage with control mode density/area sprinklers (2000 sq ft design) and no hose connections	**500**	**0**	**500**
Storage with control mode density/area sprinklers (2000 sq ft design) and 2 or more hose connections	**500**	**100**	**400**

The outside hose demand is required to be added into the sprinkler system demand at either the closest fire hydrant to the building or the place where the sprinkler system connects to the water supply that has hydrants on it, whichever is closest to the building. If the underground pipe going from the public water supply to the sprinkler system in the building does not have private hydrants on it, then the outside hose demand will usually be added at the point where the underground connects to the public water supply. If there are private

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hydrants on the same underground as the sprinkler system, the outside hose demand is typically added at the private hydrant closest to the building.

Summary

Hopefully, this has addressed many of the questions with respect to inside and outside hose stream demands. The next issue of e-TechNotes (scheduled for September 3, 2013) will continue this theme with a discussion of sizing pumps and tanks with different hose stream demand situations.