

Development of a Risk-Based Decision Support Tool To Assist Fire Departments in Managing Unwanted Alarms

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John R. Hall, Jr., Ph.D.

National Fire Protection Association – Fire Analysis & Research Division

Abstract

In February 2011, NFPA and IAFC co-hosted a summit to discuss the problem of unwanted alarms, which was leading some fire departments to conduct verification before responding to alarms received from a commercial alarm system. IAFC considered this a major challenge to the fire service, which had been unsuccessful with a set of proposals for NFPA 72 in the most recent cycle.

Out of the summit came several NFPA projects and commitments, including a guide to reducing unwanted alarms, published in July 2012. Also launched was a project to develop a risk-based decision support tool for use by fire departments. The tool was to be built around a model, in decision-tree format, which could be used to “rerun” a baseline group of calls from commercial alarm systems for emergency response, using different verification and response strategies. The tool would help local fire departments decide whether the cost savings achievable by triaging calls through verification would be more or less than the increased losses at fires that received a delayed response.

The tool was developed over the course of 2012, with the final reports completed at the end of 2012 and the implementation of the tool in an Excel spreadsheet format in early 2013.

Initially, I was inclined to the view that the extra losses at the fires would end up being more expensive than the cost savings at the far more numerous non-fire calls that would avoid a response because of verification. I was also inclined to the view that a good certification-type program could bring the non-fire calls down to a level that would seem reasonable to everyone.

Both of those views depended on the idea that non-fire calls and actual fire calls from alarm systems would look somewhat like our national statistics on false alarms versus fires. There was no question that that ratio had shifted dramatically over the years – from 3-to-1 fires over false alarms in the 1980s to 3-to-2 false alarms over fires in the late 2000s.

However, early on we realized that many of the unwanted alarms were coming in as good intent calls, not false alarms, and most of the fires in properties that might use commercial alarm systems were not being reported by commercial alarm systems.

Once we started comparing the numbers of non-fire and fire calls from commercial alarm systems, we were looking at ratios two orders of magnitude larger than we had been expecting.

The tool should still be useful to any user community, but I now have a different expectation for what the typical user will conclude from the model results.

The parameters of the model include the following:

- What percent of calls from commercial alarm systems turn out to be fires? This is the one parameter where it is very important to have local data, but the model has default data for this parameter as well as for all others.
- What percent of fires turn out to need extinguishment?
- What is the distribution of final fire sizes for the fires needing extinguishment?
- What is the average loss per 100 fires and cost per 100 responses, for several types of loss and several types of costs?
- What percent of fires occur under circumstances where nearly simultaneous reporting by building occupants is likely?
- What percent of fires occur under circumstances where attempts at verification are likely to produce inaccurate or no results?
- What is the effect of current call volume on the percent of calls arriving simultaneously, leading to delays in response because responses come from farther away for some of those calls? What effect will triaging by verification have on those delays?

The project results will be presented at NFPA's June conference, where we also hope to arrange for a few fire departments to bring in their local data and do a demonstration (or beta test) of the tool in real time.