



Daniel R. Doan

When to Replace Personal Protective Equipment

Recently, my carbon monoxide alarm started beeping. After a few hurried moments, I realized that there were no furnaces or heaters running at the time and determined that the alarm was at the end of its 10-year life. It was designed to start beeping as a warning that it should be replaced.

As usually happens, something like this starts a research study that can take a while. I found that many alarms and much of the safety equipment designed for the home have a relatively short, recommended lifetime. Perhaps some complacency had set in as I was used to industrial equipment lasting much longer, with proper maintenance of course. As the cost of these alarms is relatively low, replacement was quick and easy and provided some relief from worry.

One thing I learned from my research is that smoke detectors should also be replaced after 10 years, even if their test button shows that the alarm is working properly. I checked each of the five smoke detectors in my house,

and two were older than the recommended 10-year replacement time. Again, they were relatively inexpensive to replace. I shouldn't mention the state of the fire extinguishers in my house and garage.

Thinking about safety and personal protective equipment (PPE) in general brought me to a topic for this column. Is there clear guidance on when to replace the electrical PPE that our workers use every day? What about arc-flash (AF) PPE, for example?

I headed back to the Internet and found that there was very little solid information. There were some guidance documents that recommended the replacement of AF clothing after five years. That seems like too short of a time in every case—some PPE might last much longer and some might not last that long. Variables might include how often it is used, how well it is stored, and whether or not it is properly cleaned. The manufacturers of AF clothing have published excellent documents on the cleaning and maintenance of their products, but the common theme was to replace if it can't be repaired. It seems that if a piece of clothing is used regu-

larly and laundered often, after a few years, it may become lighter and less able to protect the worker. One manufacturer wrote that if it "looks threadbare" it should be replaced—but is that too late? Making direct contact with the manufacturer may be the best way to get some clear guidance.

Some more research was needed. I contacted Hugh Hoagland, who has presented many papers on AF PPE at the IAS Electrical Safety Workshop. He pointed out several IEEE papers and ASTM documents that discuss the effects of laundering on AF PPE; see [1]–[4]. These documents can give PPE managers a better understanding of the longevity of specialized protective clothing and can help with creating a policy for replacement. Once there is a clear understanding of the replacement policy needed for the PPE used at a facility, that information should be added to the facility's safety plan and should be carefully followed.

This thought process can be extended to other safety equipment, such as meters used for voltage

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grant a seat at the table of the NEC code-making panels. The NFPA preferred organizational representatives instead of individual representatives for consistency and consensus opinion.

IEEE agreed to sponsor industrial representatives to the NEC because industrial companies were active volunteers with IEEE. A new Standard Coordinating Committee 18 was created as a committee of the IEEE Standards Association (SA). The SA Board of Governors (BOG) directs IEEE SA by establishing policy, providing financial oversight, and conducting standards-related activities within IEEE technological fields. IEEE representatives were classified as users. Voting to establish a directed IEEE vote for NFPA ballots was limited to users: IEEE organizational representatives appointed to NFPA panels. In 1975, 10 IEEE representatives were appointed to NEC code panels. IEEE was also a charter member of NFPA 70E for the first edition, published in 1979.

The Problem

In April 2020, the SA BOG decided that the support of IEEE volunteers serving as organizational representatives on NFPA code-making panels

was no longer in the best interest of IEEE SA. The group believed that because the scope of technical communities across IEEE had expanded through the years, representing an IEEE technical position in support of the NFPA and NEC was no longer possible. Because of this, the SA voted in April 2020 to terminate all IEEE representatives to the NFPA, effective 31 August 2020. IEEE volunteers serving on NFPA panels were members of the IAS and the PES, and many had served as IEEE representatives to the NFPA for decades. The SA BOG decision left our IAS and PES volunteers stranded, without representation.

And ... the Solution

After the SA's termination of the appointed representatives in April 2020, the leadership of both the IAS and PES acted swiftly to devise a strategy to support the continued involvement of our volunteer members. IAS President Zissis and PES President Frank Lambert agreed to a joint approach to the NFPA Standards Council. An application was promptly submitted to create a new IAS/PES joint technical coordinating committee, effectively replacing IEEE

SA as the supporting IEEE organizational representative. The NFPA Standards Council asked all IEEE members to submit new applications as organizational representatives of IEEE IAS/PES. The applications were approved at the December Standards Council meeting and nearly all of the previous IEEE IAS and PES members were reappointed as organizational representatives of IEEE IAS/PES. Victory!

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testing (test before touch). Any safety equipment critical to our employees' safety can get old and may not protect the worker as expected. A thorough review of safety equipment used at a site, including its age, is a good idea and may turn up a few surprises. It's better to find a surprise during an audit and not a safety incident.

So check the age of your smoke alarms at home and your protective equipment at work.

References

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