

**Getting to Know IEC 62368-1—How Does A TV/Stereo Standard Affect My Industrial Power Electronics Design?**

by Kevin Parmenter, Chair, and James Spangler, Co-chair, PSMA Safety and Compliance Committee

In the ever-changing world of technology, standards often evolve to match the technology and the times. The prescriptive requirements of IEC 60950-1 intended for information technology equipment have existed for a long time. Independent of IEC 60950-1 is the IEC 60065 specification, which applies to audiovisual equipment, projectors, TVs and similar equipment.

Now this is all changing and, as the regulatory industry likes to say, these two standards are being harmonized into a new risk-based or, to be more accurate, a hazard-based specification known as IEC 62368-1. As with the existing IEC standards, IEC 62368-1 is also referred to using UL and EN prefixes denoting the standard’s regional equivalents. So for the sake of simplicity we’ll just refer to the various standards generically by their numbers.

The original effort to develop 62368-1, which started in the early 2000s was meant to eliminate the overlap in the two standards and reduce the overhead associated with maintaining them (see Fig. 1). In addition to combining the standards, 62368-1 aims to identify safety hazards early in the product development and design phase and remove them as opposed to simply following having product designers follow a set of rules. As with 60950-1 and 60065, the scope of 62368-1 includes subassemblies and components including internal and external power supplies, making it directly relevant for many power supply designers.

In the U.S., we’re still in a transition period when companies can seek compliance with either the legacy standards or the new 62368-1. But by June 20, 2019 manufacturers will have to transition to the new standard on any new products seeking certification as this is the date when the legacy standards are withdrawn. Meanwhile, in the European Union, the formal date of withdrawal for the legacy standards is December 20, 2020. However, as of the earlier June 20, 2019 deadline, the EU will no longer consider conformity with the legacy standards to meet essential EU legislation. So just in these two regions, the deadlines for meeting 62368-1 are looming. (Adoption of 62368-1 in China, Japan, Korea and other countries is still being studied.)

Another consideration concerns changes to the new standard. A second edition of IEC 62368-1 was published in 2014 and for those seeking compliance today, this is the standard in effect. But a third edition is expected to be released in late 2018/early 2019. As we get closer to the release of the third edition, manufacturers seeking 62368-1 certification will have to decide whether to apply under the second edition, or delay their applications until after the 3rd edition is released.

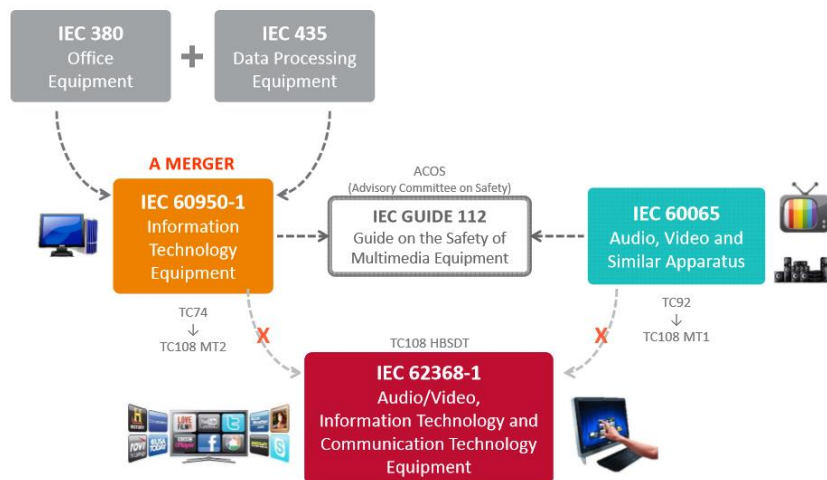


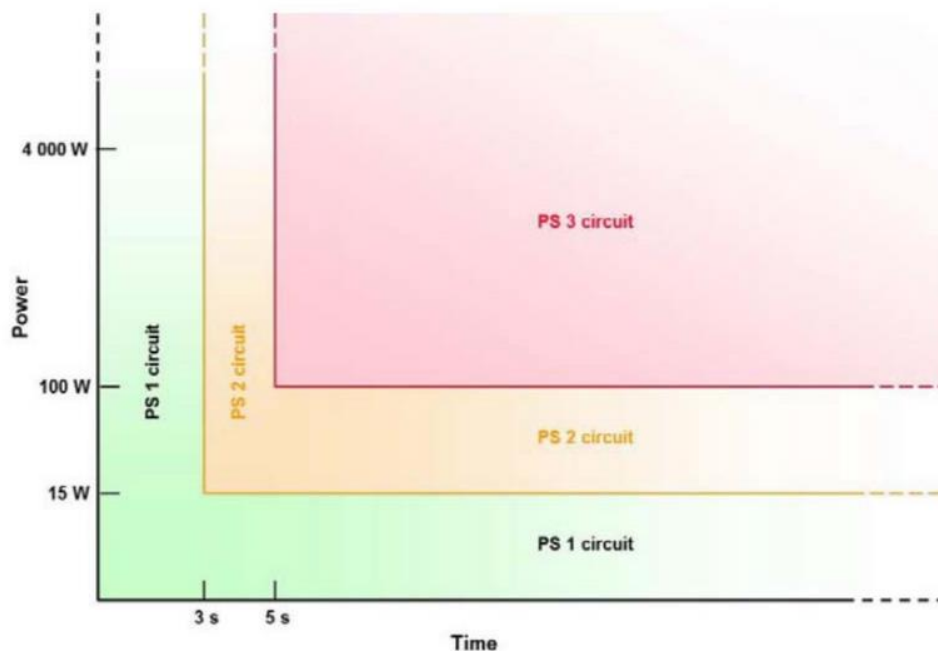
Fig 1. Evolution of the IEC 62368-1 standard. While the 60950-1 and 60065 standards were crafted to get designers to follow a set of rules in product development, the new 62368-1 aims to have designers identify and remove safety hazards during product development.<sup>[3]</sup>

If your world has anything to do with industrial, commercial, IT/computing or consumer power electronics then it's in your best interest to learn all you can about the upcoming 62368-1 requirements. To this end, the PSMA Safety and Compliance committee, which has taken on various projects including the creation of a free standards database, is doing its part to help educate the industry. The PSMA Safety and Compliance Committee is planning to have an entire section in its Power Technology Roadmap (PTR) devoted to projected compliance standards impacting power supplies in the next 2 to 5 years. We will be having a webinar on this topic in the very near future and quite a bit of this webinar will focus on 62368-1.

The committee is very fortunate to have Tom Burke, product safety engineer-distinguished member of technical staff at U.L., as one of its members. Tom, who is also a subject matter expert and member of the working group on 62368-1, recently provided a webinar on this standard.<sup>[1]</sup> His presentation goes into more depth than we possibly could in this article. As the saying goes, a picture is worth a thousand words, so a webinar is probably worth more than 10,000.

Tom's webinar tells the story of how the standard evolved, explains the principles of hazard-based safety engineering and why risk analysis is not required when applying the standard. In his webinar, Tom also gives a brief overview of the standard with power supply designers and manufacturers in mind.

His overview includes a comparison of the structure of 60950-1 with 62368-1, suitability of 60950-1 or 60065-compliant components for use in products seeking 62368-1 compliance; classification of power sources (see Fig. 2), and many other aspects of the new standard.



*Fig. 2. The 62368-1 standard includes many well-known elements from the previous standards but presented in a different way. These include classification of power sources and potential ignition sources.*

In addition, Tom discusses the timeline for adoption of the standard internationally noting the deadlines when manufacturers must transition from 60950-1 and 60065 compliance to compliance with the 62368-1. In meeting some of the transition deadlines, manufacturers will have to decide whether to seek compliance with the 2nd or 3rd editions of the new standard as noted above. Among the new elements in the 3rd edition are requirements affecting power over Ethernet and USB power delivery.

Like learning a new language immersion is the best way to learn a new standard. To learn about 62368-1 jump in and participate by viewing the webinar cited in reference 1, by viewing or reading the other references, by participating in the 62368-1 LinkedIn group (see reference 2), and even by joining us in the PSMA safety group.

Anyone interested in joining the PSMA's Safety and Compliance Committee should contact Lisa Horzepa at [lisa@psma.com](mailto:lisa@psma.com).

#### References:

1. "[IEC 62368-1 Overview](#)," UL Presentation to PSMA Safety & Compliance Committee by Tom Burke, 6/7/2017.
2. LinkedIn group on [UL Hazard Based Safety Engineering \(& the Hazard Based Standard, IEC 62368-1\)](#) for questions and information
3. "[The Road Toward A New Hazard-Based Standard: IEC 62368-1](#)," UL brochure.
4. "[The ABCs of IEC 62368-1, An Emerging Safety Standard](#)" by Tom Burke, ED, Oct 22, 2010.
5. "IEC 62368-1 2<sup>nd</sup> edition & Outlook for the 3<sup>rd</sup> Edition," live one-hour webinar on November 16, 2017 by TÜV SUD America, click [here](#) to register or see the [webinars](#) section.
6. "[62368-1 Hazard Based Safety Engineering Webinar](#)" 33-minute YouTube webinar by Mark Edge of MET Laboratories, posted October 6, 2017.

#### About The Authors



*Kevin Parmenter is an IEEE Senior Member and has over 20 years of experience in the electronics and semiconductor industry. Kevin is currently vice president of applications engineering in the U.S.A. for Excelsys, an Advanced Energy company. Previously, Kevin has served as director of Advanced Technical Marketing for Digital Power Products at Exar, and led global product applications engineering and new product definition for Freescale Semiconductors AMPD - Analog, Mixed Signal and Power Division based in Tempe, Arizona.*

*Prior to that, he worked for Fairchild Semiconductor in the Americas as senior director of field applications engineering and held various technical and management positions with increasing responsibility at ON Semiconductor and in the Motorola Semiconductor Products Sector. Kevin also led an applications engineering team for the start-up Primarion where he worked on high-speed electro-optical communications and digital power supply semiconductors.*

*Kevin serves on the board of directors of the [PSMA](#) (Power Sources Manufacturers Association) and was the general chair of APEC 2009 ([the IEEE Applied Power Electronics Conference](#).) Kevin has also had design engineering experience in the medical electronics and military electronics fields. He holds a BSEE and BS in Business Administration, is a member of the IEEE, and holds an Amateur Extra class FCC license (call sign KG5Q) as well as an FCC Commercial Radiotelephone License.*

*Jim Spangler is a Life Member of the IEEE with over 40 years of electronics design experience and is president of Spangler Prototype Inc. (SPI). His power electronics engineering consulting firm's priority is helping companies to place products into production, assisting them to pass government regulations and agency standards such as UL, FCC, ANSI, IES, and the IEC.*



*For many years, he worked as a field applications engineer (FAE) for Motorola Semiconductor, On Semiconductor, Cirrus Logic, and Active Semiconductor, assisting customers in using semiconductors. He published numerous application notes and conference papers at a variety of conferences: APEC, ECCE, IAS, and PCIM. Topics included power factor correction, lighting, and automotive applications. As an FAE, he traveled internationally giving switch-mode power supply seminars in Australia, Hong Kong, Taiwan, Korea, Japan, Mexico, and Canada.*

*Jim has a Master's Degree from Northern Illinois University (NIU), and was a PhD candidate at Illinois Institute of Technology (IIT). He taught senior and first-level graduate student classes: Survey of Power Electronics, Fields and Waves, and Electronic Engineering at IIT and Midwest College of Engineering.*

*Jim is a member of the IEEE: IAS, PELS, PES; the Illuminating Engineering Society (IES), and the Power Sources Manufacturers Association (PSMA) where he is co-chair of the Safety and Compliance Committee.*