Navigating the Impact of IEC 62368-1 on the Global Component Supply Chain

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One of the trepidations facing manufacturers of AV/ICT equipment in adopting International Electrotechnical Commission 62368-1 has been the potential impact of the standard's requirements on procurement activities through the global component supply chain, especially for components like switch mode power supplies (SMP_S) that also are investigated to the same standard as the equipment/system.

For components and subassemblies that fall under the scope of either IEC 60065 or IEC 60950-1, a certification system has been in place for many years that has allowed the component supply chain to meet the needs of equipment and systems designers seeking to demonstrate compliance of their products with either IEC 60065 or IEC 60950-1 and the national and/or regional equivalents of these standards.

Now, with the introduction of IEC 62368-1, the new hazard-based standard for safety of AV/ICT equipment, and with both the EU and U.S. formal transition date June 2019 to the requirements of the new standard, manufacturers may rightly wonder whether the new standard will upset the established supply chain system for high-tech components that has worked well for so many years.

As with any new standard, there are likely to be challenges. It makes good business sense for manufacturers to be cautious about embracing IEC 62368-1 until they are reassured that this new standard won't disrupt the present system. However, IEC TC 108, the IEC's Technical Committee responsible for IEC 62368-1, has taken proactive steps ease the transition in meeting the standard's new requirements, and allow the current component supply chain to continue meet the needs of suppliers and their customers while also designing new products to the requirements of the new standard.

Let's take a closer look at some of these steps.

IEC TC108's Responsible, Forward-Looking Strategy

First IEC TC 108 included important provision in IEC 62368-1 from the beginning that should help with the transition. In Sub-clause 4.1.1 on the application of requirements and acceptance of materials, components and subassemblies, TC 108 added an important provision that allows components and subassemblies that comply with either IEC 60950-1 or IEC 60065 to be accepted as part of equipment covered by IEC 62368-1 *"...without further evaluation other than to give consideration to the appropriate use of the component or subassembly in the end-product."*

As indicated in an informative note immediately following the above noted paragraph, this provision was added to the Sub-clause *"...to provide a smooth transition from the latest editions of IEC 60950-1 and IEC 60065 to this standard (62368-1)."*

Although this provision eventually will be removed from the standard (possibly as early as the third edition), it currently provides for the use of certified components and subassemblies complying with either IEC 60065 or IEC 60950-1 in equipment investigated and certified to IEC 62368-1 with minimum additional consideration other than the appropriate use of the component (for example, per its established electrical ratings).

What about application details?

One familiar with the legacy standards IEC 60065 and IEC 60950-1 as well as some of the fundamental aspects of IEC 62368-1 might next ask whether incorporating components certified to either IEC 60065 or IEC 60950-1 in equipment being investigated to IEC 62368-1 could cause application issues. For example, a switch mode power supply certified to IEC 60950-1 typically has output circuits classified as safety extra low voltage (SELV). However, in IEC 62368-1, the term SELV has been replaced with the ES1 (class 1) energy source classification, which considers both voltage and current in its definition.

It is true that IEC 60950-1 and IEC 62368-1 classify energy sources and circuits differently. However, when investigating equipment as well as incorporated components and sub-assemblies to the requirements of IEC 62368-1, designers, manufacturers and certifiers need to step back and take a practical view of the application of the safety standard to the product, and consider the intent of IEC TC 108 when the legacy component provision was added to IEC 62368-1.

While the energy sources, circuit designations and even parameters of some terms and definitions may differ the bottom line is that an SELV circuit is safe to touch by a user (or operator) under IEC 60950-1, just as an ES1 energy source is safe to touch by an Ordinary Person (user or operator) under 62368-1. For the purpose of transitioning to the essential requirements of the new standard, they offer equivalent levels of safety.

Therefore, for the application of IEC 62368-1 to end products and systems, the interconnection of SELV and ES1 circuits can be accommodated on a practical level without delving into all the minute details, especially if the rationale for IEC 62368-1's legacy component provision is kept in mind, i.e., *"...to provide a smooth transition from the latest editions of IEC 60950-1 and IEC 60065 to this standard."*

The Additional Need for Backwards Compatibility

Another potential concern expressed by some component manufacturers over the adoption of IEC 62368-1 is whether there might be an unintended but potentially negative impact from transitioning to the requirements of IEC 62368-1 while also supplying components to manufacturers that are continuing to certify their AV/ICT equipment to IEC 60065 or IEC 60950-1. Realistically, a considerable number of end product and system manufacturers plan to continue to use either 60065 or 60950-1 for investigating and certifying their equipment for at least one or two more years. Component manufacturers fear that, if they transition to IEC 62368-1 too quickly, customers wish to continue to source components compliant with IEC 60065 or IEC 60950-1 might experience incompatibilities with accompanying testing challenges and certification delays.

Again, it is understandable that some component manufacturers may be apprehensive about adopting the new standard at this stage without some knowledge of how it might impact their business and customers. However, after studying the issue closely and soliciting input from global customers who play a critical part of the global high-tech component supply chain, several years ago UL Solutions proposed to IEC TC 108 that provisions be added to the next versions of IEC 60065 and IEC 60950-1 to allow these legacy standards to accept components that have been designed, investigated and certified to IEC 62368-1.

UL Solutions' rationale for these changes was that IEC 62368-1 is intended to be a "state-of-art" safety standard for AV/ICT, and that its use should provide backward compatibility with legacy standards covering the same equipment. Indeed, such a provision is justifiable for the same reasons that IEC TC 108 included a provision in IEC 62368-1 that allows for the incorporation of components complying with IEC 60065 or IEC 60950-1 "to provide a smooth transition" from the requirements of the legacy standards.

IEC TC 108 agreed with UL Solutions' proposal, and incorporated a provision in each of the latest versions of both IEC 60065 (Edition 8) and IEC 60950-1 (Edition 2, Amendment 2). This new provision allows for components and subassemblies that comply with IEC 62368-1 to be accepted in equipment investigated to IEC 60065 or IEC 60950-1 without further evaluation, other than to give consideration to the appropriate use of the component or subassembly in the end-product.

As with the incorporation of legacy components in equipment investigated to IEC 62368-1, there will also be a need to accommodate the use of different terminology and circuit classifications for IEC 62368-1-compliant components incorporated into AV/ICT equipment investigated to the requirements of IEC 60065 or IEC 60950-1. But once again,

these technical details are wholly manageable if designers, manufacturers and certifiers view the transition in a practical sense and keep in mind the rationale for including such provisions for transition in the standards in the first place.

Planning the Supply Chain Transition to IEC 62368-1

The time is right to start serious planning for IEC 62368-1 and its eventual adoption as a permanent replacement of the legacy standards IEC 60065 and IEC 60950-1. The second edition of IEC 62368-1 has been published and has now been adopted in the EU and North America, with mandatory transition dates now less than four years away (2019). Furthermore, it is expected that other countries, including some key Asia-Pacific markets, were adpted by the end of 2016.

As a certifier who has issued growing numbers of certifications to CSA/UL 62368-1 as well as IECEE CB Reports/Certificates to IEC 62368-1, UL Solutions has seen significant interest among manufacturers in transitioning to the requirements of the new standard, while seeking to pace the changeover in a manner consistent with their own specific issues and timetables. A number of manufacturers are more comfortable immersing themselves slowly in the new standard, first seeking to address the knowledge/training aspect of the transition before taking more formal steps. As a result, UL Solutions is offering knowledge-based services at several different levels for those manufacturers seeking an introduction to the requirements of IEC 62368-1.

Another popular service has been gap analyses, in which UL Solutions prepares a detailed evaluation of the potential differences between a product investigated to 62368-1 and a product investigated to either IEC 60065 or IEC 60950-1. This gap analysis provides a baseline understanding of how the new standard is likely to affect products currently certified to a legacy standard, as well as practical guidance on the steps to take to meet the requirements of IEC 62368-1.

For those manufacturers who are prepared to conduct an actual product investigation and certification process consistent with the requirements of IEC 62368-1, UL Solutions typically recommends starting with the certification of one or more products using IEC 62368-1 along with either IEC 60065 or IEC 60950-1. Since the IECEE CB Scheme is already active for IEC 62368-1, this strategy also allows the manufacturer to receive a CB Test Report and Certificate to IEC 62368-1, providing broader market access.

Regardless of the specific transition preferences, UL is well-equipped to work with AV/ICT equipment systems and component manufacturers to develop a transition roadmap for IEC 62368-1 that eliminates confusion, reduces duplicate testing and certification, and provides a path for uninterrupted global market access. For additional information on how 62368-1 may impact your company, please contact **Carolyn.Arndt@ul.com**

To achieve basic knowledge of the IEC 62368-1, UL Solutions offers online, public and private seminars on the new standard, allowing participants to understand the new standard and its hazard-based principles, as well as some of the key differences between IEC 62368-1 and legacy standards IEC 60065 and IEC 60950-1. Additional information is available at UL Solutions' comprehensive Knowledge Solutions website (search under "Consumer Technologies").

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