ISCE

The Institute of Sound and Communications Engineers

Engineering Note 20.1

Supply current requirements for a PA/VA installation

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from a suggestion by Ray Gatehouse MInstSCE

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Electrical contractors need to know the supply current requirements of your installation so that they can provide a suitable feed. Usually, the power amplifiers' requirements greatly exceed those of other equipment. But their current consumption varies with signal level, and taking the maximum value is normally a gross overestimate. The numbers on the rating labels are there to satisfy safety requirements and may or may not bear a resemblance to reality.

However, the safety standard, IEC/EN 60065, does help. For safety purposes, temperature rises etc. are measured with the amplifier delivering one-eighth of its 'non-clipped' output power, using a weighted noise signal specified in the standard, which is the IEC Simulated Programme Signal. If that's OK for making sure the amplifier doesn't get too hot, it is OK for determining the supply current, especially as the signal represents continuous, somewhat compressed, music, a more stringent test signal than normal speech.

So, to determine the relevant supply current of one amplifier, it is set up to produce one-eighth of non-clipped output power from the weighted noise signal and the supply current measured with a REALLY, TRULY RMS ammeter. It isn't anywhere near a sine wave, unless the amplifier has (distortion) power factor correction (PFC); if it has, you don't really need an RMS ammeter.

If the system has been designed to run with either unusually high or unusually low power-amplifier headroom (low or high line voltage respectively), then an adjustment should be made to the 'one-eighth', but that value should be OK unless the amplifiers are run well into clipping under emergency conditions. (Running into clipping doesn't affect intelligibility much, but is hard on the high-frequency drivers in multi-way loudspeaker systems.)