National Committee	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	OBSERVATIONS OF THE SECRETARIAT on each comment submitted
ANSI ASC C63	ANSI C63.19:2011	Clause 5	Technical	(See question below)	None provided	(See answer below)

Question:

With the definition of concurrent connections as modes that permit active voice calls at the same time with other active connections for data, or other voice calls, how should devices that support concurrent transmission of multiple services through 1 RF carrier (e.g. multi-RAB WCDMA, LTE) be evaluated for HAC compliance?

Answer:

Concurrent transmission of multiple services can be viewed from several perspectives. From the user perspective and at the application layer there are multiple simultaneous services operating. However, from the perspective of the MAC and PHY layers there is only a data load to be transmitted with transmission options allowed by the network and the current signal quality. An active voice call establishes a base data load. However, there are variations in the data load with only a voice call, such as when one side of the conversation is in mute and hence there is no data to be sent in that direction. From the base data load for the voice call other services add to the data load. The result will be changing of the transmission bandwidth, modulation and other parameters in order to optimize service. The C63.19 standard requires that the worst case operating mode be identified and that testing be done in that worst case operating mode. The 3GPP standard defines the transmission variations which are possible with LTE. See the May 26, 2012 interpretation of a question on subclause 4.2 for further detail on identifying the worst case operating mode for LTE and the relevant 3GPP standards. Other RF access protocols should follow a similar process to identify the worst case operating mode. A process for evaluation per ANSI C63.19 is described below:

1) Identify which data transmission modes can be expected to occur concurrently with voice operation when the wireless device is held to the ear.

2) Establish a concurrent data and voice transmission pattern that is representative in the operating modes to be evaluated. Base station simulators will typically force data traffic to create the required operating mode, which allows for evaluation of transmission variations one at a time.

3) Evaluate the operating modes that are possible with voice operation and find the one with the highest audio interference potential, as indicated from the combination of its MIF and maximum average power.

4) The evaluation to ANSI C63.19 is to be performed using the worst case operating mode.