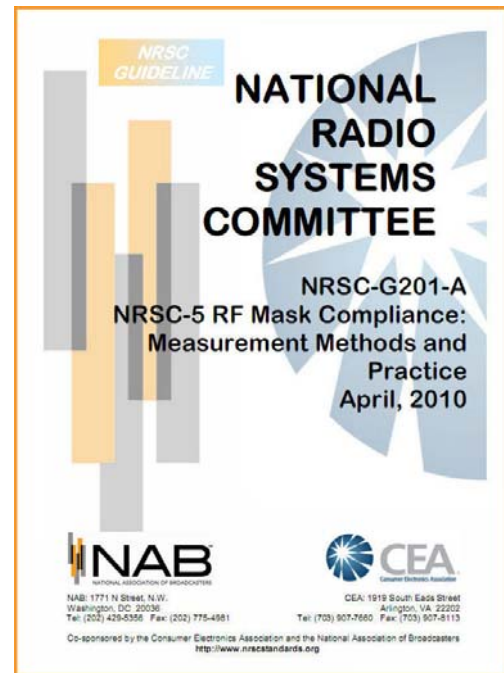




NRSC Updates G201 RF Mask Compliance Measurement Guideline

One of the ongoing missions of the National Radio Systems Committee (NRSC, www.nrsccstandards.org) is to develop recommended practices for the radio broadcasting industry, called "NRSC Guidelines," that help broadcast engineers and receiver manufacturers work together to offer the best possible terrestrial radio service that they can. At the most recent meeting of the NRSC's DRB Subcommittee, held last Saturday in Las Vegas in conjunction with the 2010 NAB Show (April 10-15, 2010, www.nabshow.com), an update to one of these Guidelines was adopted that adds information on a new digital radio quality metric which promises to help broadcasters identify and correct potential problems in their transmission plant.

NRSC-G201-A, NRSC-5 RF Mask Compliance: Measurement Methods and Practice, was developed by the Subcommittee's IBOC Standards Development Working Group (ISDWG) which is chaired by Dom Bordonaro, chief engineer, Cox Broadcasting - Connecticut. Geoff Mendenhall, VP transmission research and technology at Harris, and Harris' representative to the NRSC, led the ISDWG sub-group responsible for the updated portions of the Guideline, which describe a new, standardized method for determining the transmission quality of an FM IBOC signal called Modulation Error Ratio (MER). At Saturday's meeting, Bordonaro indicated that with the FM IBOC MER technique now developed, the ISDWG is planning to now consider development of a similar capability for AM IBOC.



Broadcasters can use MER to assess the performance of their transmission facility and to potentially identify problems resulting in a less-than-optimum signal. This Guideline update is based upon measurement techniques described in a new "reference document" from iBiquity Digital Corporation entitled Transmission Signal Quality Metrics for FM IBOC Signals. This updated Guideline will help the industry better understand MER as transmission and signal measurement equipment manufacturers are expected to soon offer the industry new and improved devices incorporating MER techniques (see the [September 28, 2009 issue](#) of Radio TechCheck for additional information on the iBiquity reference document).

MER is a type of "digital signal quality" testing as opposed to other types of signal quality testing such as measurement of spurious RF energy or harmonic distortion. Digital signal quality testing involves the analysis of digital waveforms (in the case of IBOC MER measurement, symbols of the baseband signal) for their deviation from the corresponding ideal waveform. This is a powerful technique to characterize the overall "health" of a transmitted signal and help troubleshoot problems with transmitted IBOC signals. Distortions of the waveform increase the chance of receiving errors in the symbols used to represent the digital information. These distortions can be measured and the results can be compared to recommended specifications.

In addition to the information about MER (which is contained in Section 4.4.3 of the document), the Guideline has also been updated to include new information about the relationship between the *total* digital signal power in an FM IBOC signal relative to the digital signal power in the "Primary Main" subcarrier group. In the table shown below (taken from Table 2, Annex 1 of the Guideline), the last row has been added to provide information on the additional amount of digital power due to the addition of the so-called "Primary Extended"

subcarrier groups which broadcasters may use to increase the data capacity of their signal. This is valuable information because it can help broadcast engineers understand the amount of additional digital power they are allowed to transmit relative to their authorized power as they elect to implement Extended hybrid modes of operation (which use the primary extended subcarriers).

Parameter	Hybrid Mode			
	MP1 [†]	MP2	MP3	MP11
Subcarrier groups	Primary Main (PM)	PM + Primary Extended (PE) 1	PM + PE 1 & 2	PM + PE 1, 2, 3 & 4
Passband start (Hz from channel center)	129179	122275	115371	101563
Passband (Hz from channel center)	198583	198583	198583	198583
Total number of subcarriers	191	210	229	267
Nominal power per sideband (dBc)	-23.0	-22.6	-22.2	-21.5
dB referenced to PM power (MP1 mode)	0.0	+0.4	+0.8	+1.5
Ratio of total power relative to PM power	1.0	1.1	1.2	1.4

[†]Assumes -20 dBc licensed PM total power

The NRSC-G201-A document will be available free-of-charge on the NRSC's web site at www.nrscstandards.org, following a final, procedural review which will take approximately two weeks. The NRSC is a technical standards-setting body co-sponsored by the National Association of Broadcasters (NAB) and the Consumer Electronics Association (CEA). Additional information about the NRSC, including information on becoming a member, is also available on the web site.

Additional details and registration information for the 64th NAB Broadcast Engineering Conference is available at www.nabshow.com. For 2010, the NAB Show is proud to offer smarter registration packages that give you access to more –

more sessions, more cross-conference access, more year-round learning opportunities, more networking – all for one great price. Check out the [Best Value Packages](#) including a new SMART Pass and Conference Flex Pass.