Interpretation/explanation Request 2004-C63-SC1-7
27 September 2005

Dear Bob and Ralph,

I would like to formally and officially request an interpretation of a requirement in ANSI C63.5-2004 by the committee ANSI C63.

There seems to be a conflict in requirements to the effect under which circumstances the free space antenna factor is to be used. In section 5.1 of ANSI C63.5-2004 it is stated: "For biconical dipole antennas, corrections to free space shall be applied for product measurements and are provided in annex G". However, in Annex G (normative!), Figure G.2, it is clearly indicated that the correction of near-free space factors to free space factors for biconical antennas is only applicable to NSA measurements.

This clearly indicates a conflict in requirements. Furthermore, the use of the corrected near-free space antenna factor for product measurements was something that was never really discussed during the development of the standard. The primary reason for the correction of the near-free space standard (to obtain the free space antenna factor) was the reduction in error for NSA measurements.

I would sincerely appreciate a timely interpretation and clarification of this conflict in requirements. It possibly has a direct impact on the compliance determination of many products and is to be addressed as soon as possible.

Thanks very much in advance for looking into this matter.

Best regards,

Werner Schaefer
Cisco systems, Inc.

The following response from the ASC C63 Subcommittee 1 is considered an interpretation of a clause and figure in ANSI C63.5-2004

Background:

With respect to the conflict in 5.1 and Annex G: The comments are accepted and a discontinuity does appear to exist between clause 5.1 and Annex G . We will revise the standard to reflect the original intent of the working group, which was confirmed in the balloting process, which is that FSAF are needed for compliance testing when using biconical antennas. For NSA measurements, FSAF are needed when using biconical antennas and are then converted into GSAFs for the actual NSA measurement. The revised flow chart below addresses this correction.

Antenna calibrations in C63.5-2004 are done at a 2-meter transmitting height in a horizontal polarity with the transmit and receiving antennas 10 meters separated and the receiving antenna is searched in height 1 to 4 meters. This measurement yields a near free space antenna factor due to influences of the ground plane and mutual coupling.

Table G1 of the new standard enables calibration laboratories to correct the measured near free space antenna factors to true free space factors for biconical dipole antennas. All other antenna types will still need to use near free space antenna factors for product measurements because we do not yet have numerical models to correct for the influences. Tables G2 and G3 are then used for correcting the FSAFs into geometry specific antenna factors for biconical dipoles when they are used for NSA testing. Figure G2 then shows the above considerations in a flow chart.

In summary, the table G.1 in annex G is for correction factors to arrive at free space antenna factors for biconical antennas. Tables G.2 or G.3 (GSCF tables) is used for NSA measurements using the results based on the application of Table G.1.

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Interpretation:

The wording in Clause 5.1, last paragraph, will be reworded to state:

> "Antenna factors obtained for biconical dipole antennas using the SSM in this document yields near free space antenna factors. These factors ~~that are used for either product testing or NSA testing~~ shall be corrected to free space values using the correction factors provided in ~~Annex~~ table G.1. For biconical antennas, tables G.2 and G.3 are used to correct FSAF to take into account the different geometries used in performing NSA measurements. See annex G for additional details."
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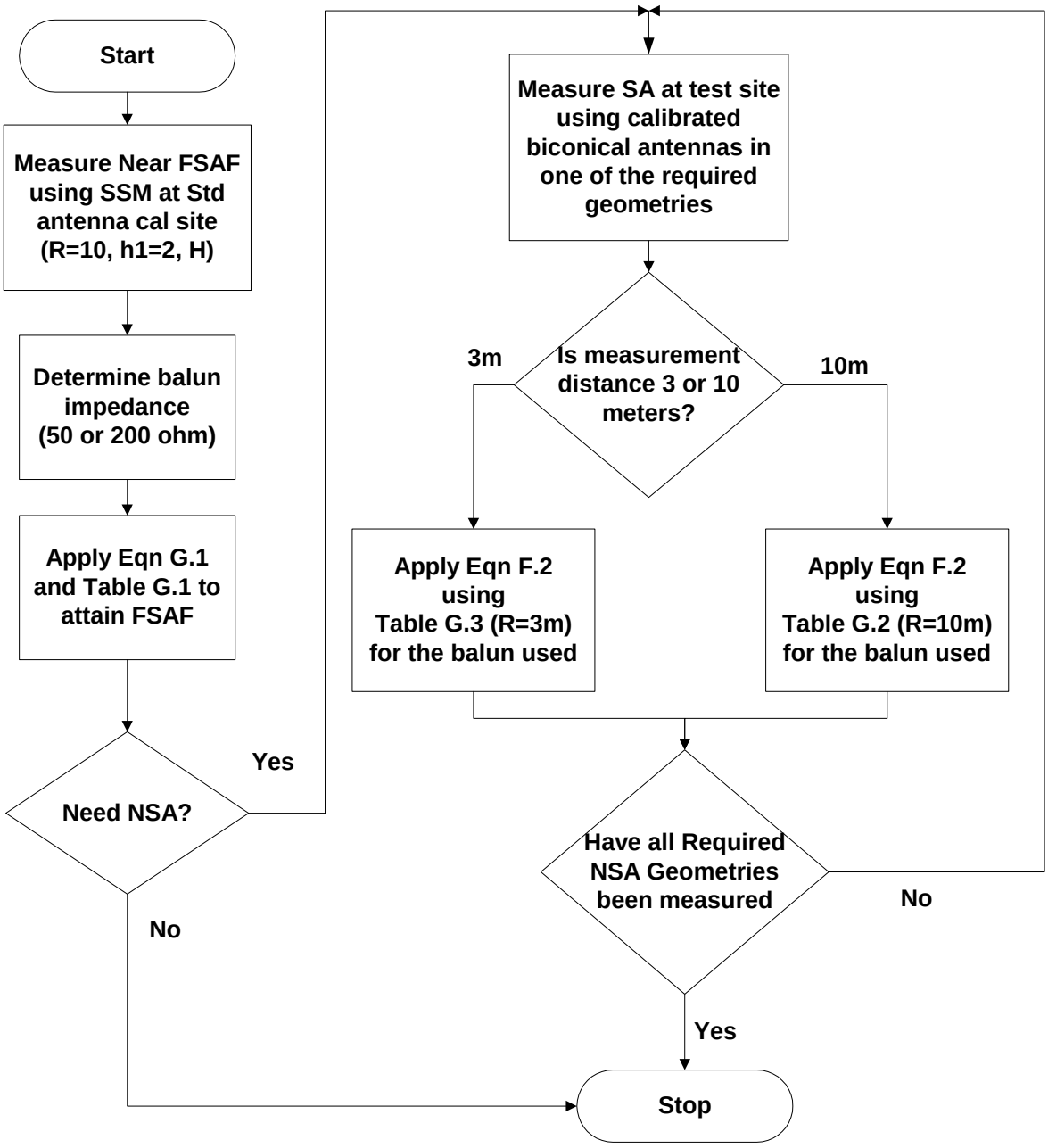
> See new Figure G2 (title to remain the same as that in C63.5-2004) which is shown below:


Start
Measure Near FSAF using SSM at Std antenna cal site (R=10, h1=2, H)
Determine balun impedance (50 or 200 ohm)
Apply Eqn G.1 and Table G.1 to attain FSAF
Need NSA?
Yes
No
Measure SA at test site using calibrated biconical antennas in one of the required geometries
Is measurement distance 3 or 10 meters?
3m
10m
Apply Eqn F.2 using Table G.3 (R=3m) for the balun used
Apply Eqn F.2 using Table G.2 (R=10m) for the balun used
Have all Required NSA Geometries been measured
No
Yes
Stop