RFpeople

ET 03-137, the NPRM on RF Exposure Guidelines

Comments on the Use of Modeling in the Assessment of RF Exposure

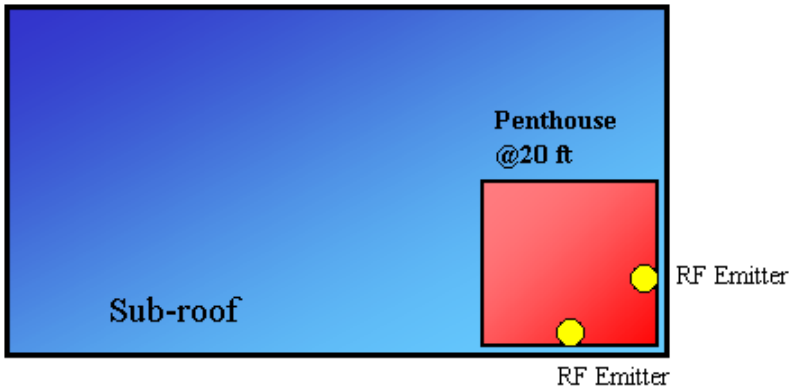
Summary: *Various software programs for modeling RF exposure environments are available. Some of these programs apply factors that require significant technical understanding and impact the results significantly. Results of modeling also are confusing if a program is limited to 2-D surface modeling, requiring multiple depictions that are subject to misinterpretation. The clarity advantage of 3-D surface modeling is discussed, along with some discussion on what constitutes a "qualified" operator of modeling tools that affect public safety*

We respectfully request that the Commission consider these comments:

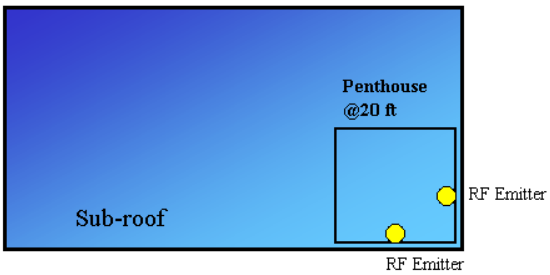
There are a number of RF Hazard assessment methods available to determine RF Exposure compliance.

With respect to modeling, there are RF exposure modeling products that are available for general purchase that apply concepts like spatial averaging, which the Commission is reconsidering (and is commented on by us separately). It is impossible to differentiate an analysis that is performed by a novice that applies inappropriate factors that are default values in a modeling tool, from one performed by an experienced and qualified operator. That a modeling tool is used does not ensure that it is properly used and is cause for some concern.

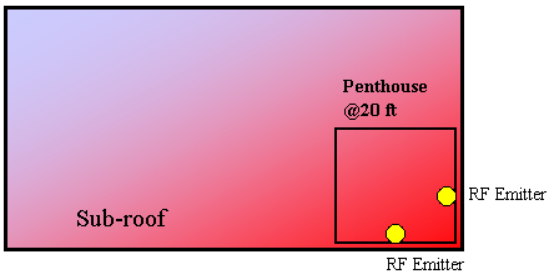
Additionally, the use of RF exposure maps that are created by modeling causes some concern in multi-level areas. With 2-D modeling tools, operators must model an exposure scenario over multiple levels – causing confusion in the case where RF exposure maps show compliance when modeled on one level versus another for the same rooftop area. The problem is illustrated with the following graphic:



Example top-down 3-D rendering of the RF Exposure Environment



Modeled at sub-roof level



Modeled at penthouse level

Example of a typical top-down 2-D Rendering of an exposure scenario

In the case of the previous graphic, a 2-D rendering requires an RF Exposure map for each level to be generated. This is a safety issue because a worker, upon reviewing the maps, can easily misinterpret the exposure scenario and unknowingly place himself or herself in an unsafe environment.

A 3-D rendering eliminates the possibility of this confusion and should always be used when describing a modeled exposure environment to the layperson. Modeling programs should be capable of rendering RF exposure environments over the appropriate 3-D surface so that RF exposure criteria can be clearly shown and confusion minimized.

Modeling programs should only be utilized by qualified personnel who understand the various complexities involved with modeling RF emitters, especially in complex environments. Qualified personnel should understand when and if it is appropriate to apply concepts such as spatial averaging, which can lead to inappropriate RF exposure situations when used improperly.

As with our comments on measurements, the definition of "qualified personnel" for public safety purposes (and therefore RF safety) is a subject of much debate. Ultimately, this person should be what is defined by states and localities as someone in "responsible charge" of the integrity of the engineering measurements/calculations performed, and the engineering conclusions reached by such calculations.

In every state in the union this person would have to be duly licensed as a professional engineer, and operating within their area of expertise. In this way a direct level of public safety accountability and oversight is provided. This does not mean that a professional engineer must perform every measurement or calculation, but that a professional engineer must be in *responsible charge* of the collection and processing of such measurements and/or calculations, and the conclusions that are reached.

We suggest that the FCC defer to the existing body of state law on the proper and legal practice of engineering, in the implementation of FCC rules on RF exposure, just as there is properly no federal jurisdiction over state and local structural engineering certifications and building codes that are also a matter of public safety.

In any case, any modeling assessment should clearly indicate who is in responsible charge of the engineering assessment, any assumptions that were made, and any other factors that were applied or used in creating the RF exposure model.

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