8.6.2 Traffic Generation

While the BS output power and the outage ratio is likely to be calculated for a single CDMA cell, accurate modelling of power control requires the consideration of inner-system interference generated by the surrounding tiers of CDMA cells. The significance of other cell interference in CDMA requires that at least two tiers surrounding the cell of interest be considered. However, BS power and outage statistics will only be collected from the center cell, which has the most accurate interference background (two surrounding tiers). Cells surrounding the center cell will not be visible to the higher levels of SEAMCAT and will only be used to generate the inner-system other-cell interference background for the center cell (Figure 195).

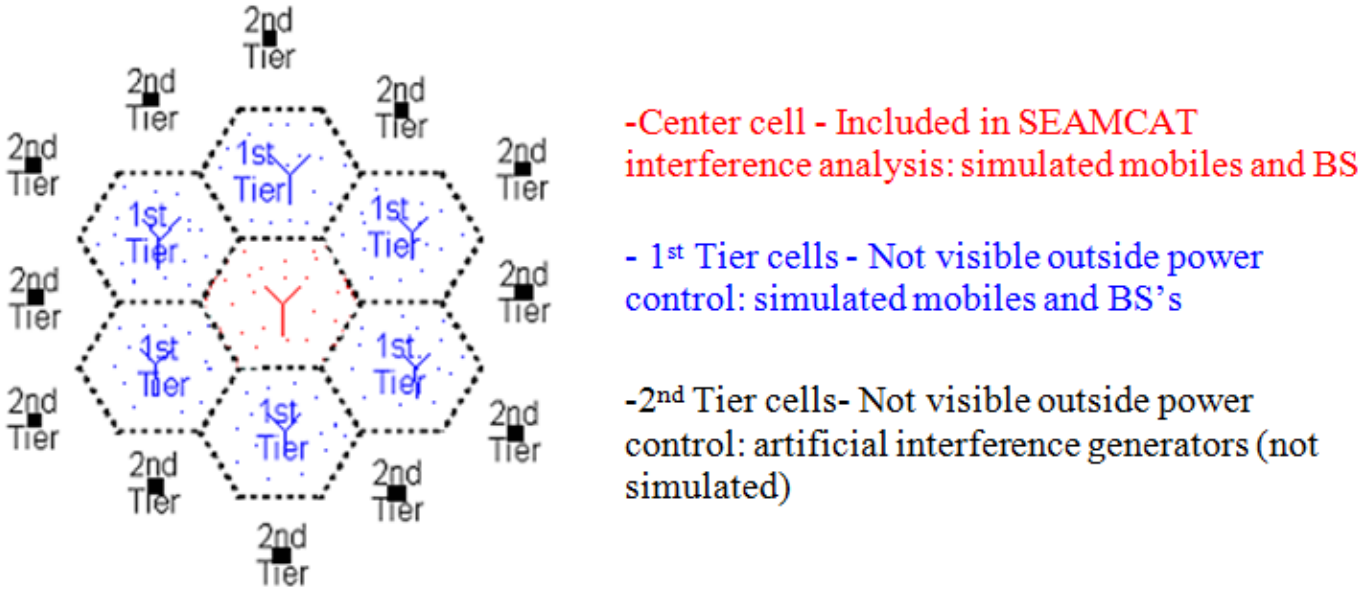

Figure 195: Cell layout for power control

The power control simulation time increases with the number of cells for which power control algorithm is run. One way to reduce the simulation time is to simulate only the center cell and the first tier around it with actual power control algorithms and use artificial interference generators for the second tier as shown in Figure 195. More specifically, the BS's in the center cell and the first tier go through the power control algorithms and calculate the precise power they need to transmit. Whereas, the BS's in the second tier are assigned an output power level to generate interference into the center cell and the first tier. If the output power level set for the second tier is reasonable, this approach will speed up the simulation considerably without sacrificing much from accuracy. Possible methods to determine the appropriate artificial interference level will be addressed later in the paper. Nevertheless, if more accurate results are desired, the second tier can also be simulated using actual power control. In that case, a third tier with artificial interference generators would further increase accuracy by presenting the second tier with a more realistic interference background. However, given the considerations on complexity, the layout shown in Figure 195 presents the most appropriate balance between simulation speed and accuracy.

Since higher levels in SEAMCAT consider only a single CDMA cell, the cell layout shown in Figure 195 may need to be generated separately in the power control module. It is expected that the UE placement be done consistently with SEAMCAT's existing algorithms. However, once the UEs are placed, their mobility assignment should also be done. Actual mobility of the UEs cannot be simulated easily in a static simulation, but the effects of mobility on the channel power can be modeled in a limited sense. While the UEs will be treated at fixed locations within each snapshot, each will be assigned a speed to determine their channel conditions (fast fading), which will be used in the determination of their channel power requirements. This allows the flexibility to simulate various system configurations (fixed, highway, pedestrian, etc.).

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