

INTERFERENCE

Introduction To Telecommunications
By Engr. Abdul Rehman Chishti

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System Interference

- * Interference is defined as adverse interaction between two or more radio signals that causes noise or effectively cancels both signals.
- * It occurs between two transmitting radio signals whose frequencies are too close together, or even identical
- * In most cases, the interference is a by-product of frequency reuse
- * Types- 1. Co Channel Interference 2. Adjacent channel interference

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Cochannel Interference

- * Occurs when the same base station carrier frequency reaches the same receiver (mobile phone) from two separate transmitters (bases stations).
- * This type of interference is usually caused when channels have been assigned to two cells that are not far enough apart geographically and their signals are strong enough to overlap with each other, thereby causing interference.
- * It is the by product of frequency reuse.
- * It is important to ensure that the frequencies are reused far enough apart geographically, to ensure that no interference occurs between identical frequencies/channels.

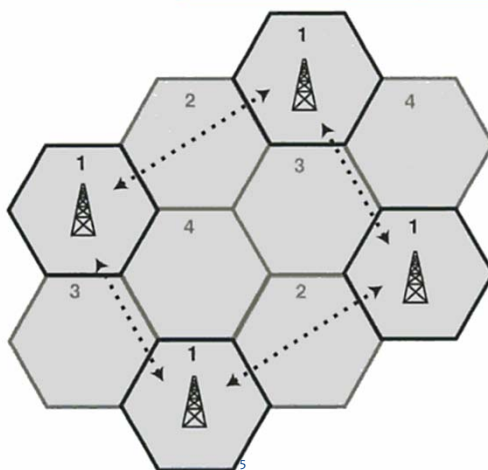
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- * To avoid this interference
 - * The cell sites are physically placed far enough apart
 - * The appropriate power levels must be maintained at cell base stations
 - * If power levels at one cell are too high, the RF coverage could overlap and hence possibly interfere with a cochannel cell.
 - * Reduce tower heights
 - * Use down tilt antenna when and where appropriate

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Adjacent Channel Interference

- * It is caused by inability of a mobile phone to filter out the signals (Frequencies) of adjacent channels assigned to nearby cell sites
- * Channel 361 in Cell A, Channel 362 in Cell D
- * Where Cell A and D are in the same frequency reuse cluster
- * Adjacent channel interference occurs more frequently in heavily used cells
- * Good system design can minimize adjacent channel interference temporarily by preventing adjacent channel assignments in cells that are near each other

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- * Adjacent channel interference can be minimize through careful filtering and channel assignments.
- * Since each cell is given only a fraction of the available channels, a cell need not be assigned channels which are all adjacent in frequency.
- * By keeping the frequency separation between each channel in a given cell as large as possible, the adjacent channel interference may be reduced
- * Instead of assigning channels which form a contiguous band of frequencies within particular cell, channels are allocated such that frequency separation between channels in a given cell is maximized