

1.4.2 An illustration with C/I as interference criterion

The C/I ratio available at the victim receiver's input is computed using both the iRSS (Interfering Received Signal Strength) and the dRSS (desired Received Signal Strength),. Figure 7 illustrates the various signal levels used to determine whether or not interference is occurring.

Figure 7(a) represents the situation in case of no interference - the VLR is receiving the dRSS with some safe margin above its sensitivity level. The victim's signal level is the sum of the sensitivity and wanted signal margin I.

Figure 7 (b) illustrates the case of tolerable interference. The interference power iRSS adds to the noise floor power resulting in an increase of the noise floor. The example introduces an increase of 1 dB of the noise floor caused by an iRSS 6 dB below the noise floor. As a result the wanted signal margin is also reduced by 1 dB assuming a constant wanted signal power. However since the original wanted signal margin is much larger the interference is tolerable -i.e. the C/I ratio available at the receiver's input is larger than the S/N required for the operation of the system.

Figure 7(c) shows the case of interference which can not be tolerated - i.e. the operation of the system is impaired. The power sum of all the interfering signals including the noise floor of the receiver results in an insufficient wanted signal margin -, i.e. the C/I ratio available at the receivers input is less than the S/N ratio required for the intended operation.

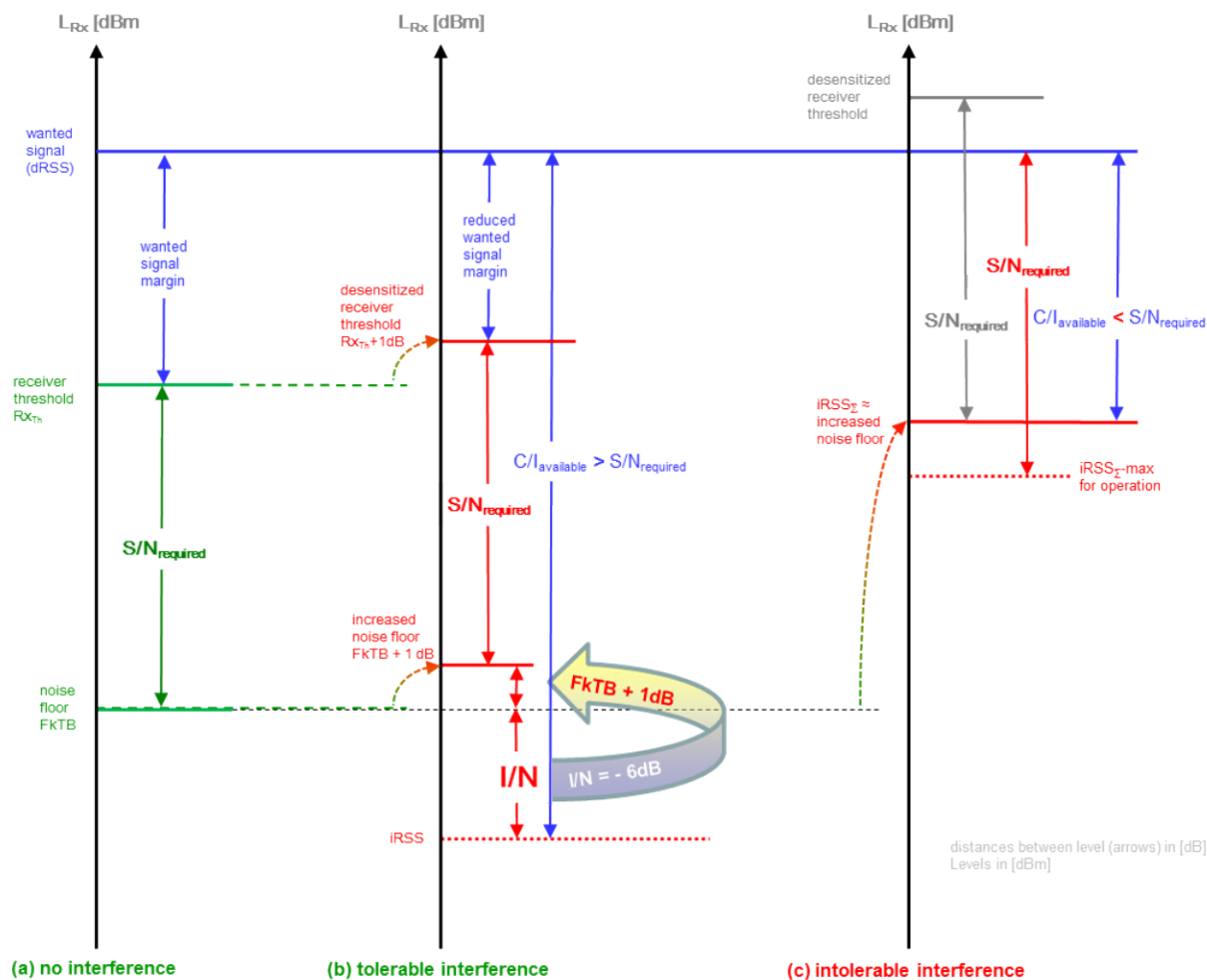


Figure 7: Levels used to determine whether or not interference is occurring

As a receiver cannot distinguish between various sources of interference or noise, the sum of all interfering signals including the receiver noise floor has to be taken into account. The C/I ratio available at the receiver's input must be greater than the S/N required for the operation of the system if the interference is to be avoided. SEAMCAT checks for this condition and records whether or not degradation due to interference is occurring. This is illustrated further in Figure 8

The Monte Carlo technique works by considering many independent events in time (or in space). For each instant a scenario is built up using a number of different random variables, i.e. where the interferer is located with respect to the victim, the signal strength of the wanted signal, which channels the victim and interferer are using etc. If a sufficient number of simulation trials are run then the probability of a certain event occurring can be calculated with a high level of accuracy.

In this way, the tool is able to quantify the **probability of interference** between radio systems and is able to help determine appropriate frequency arrangement rules or identify suitable limits for transmitter/receiver performance.

You can select the **interfering modes** (unwanted and blocking) as well as the **interference criteria** of your choice in SEAMCAT as shown in Figure 97.

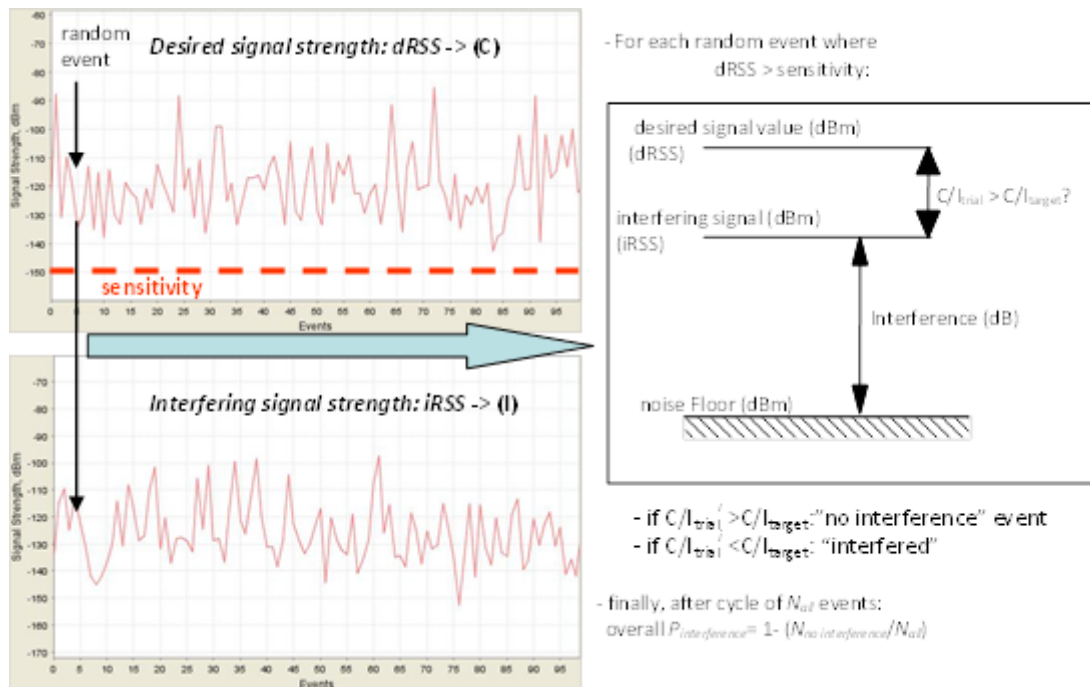


Figure 8: Illustrative summary of the interference criteria computation

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