Is ~~[illegible]~~ handled?

Ans:- Once a call is established, the setup channel is not used again during the call period, therefore handoff is always implemented on the voice channel. The value of handoff is dependent on the size of the cell. Handoff is needed in two situations 1) where the cell site receives weak signals from the mobile unit i.e at the cell boundary 2) when the mobile unit is reaching the signal strength within the cell site.

To find the ~~requirement~~ probability of requiring a handoff, we can carry out the following simulation:

1) Suppose that a mobile unit randomly initiates a call in 10 mi cell
2) The vehicle speed is also randomly chosen as 5 to 60 mi/h

3) The direction is randomly chosen to be between 0° to 360°, then the chance of reaching the boundary is dependent on the call holding time.

Initiation of a Handoff

When the signal strength reaches the level of a handoff, then the cell site sends a request to the MTSO for a handoff on the cell.

Suppose that -100dBm is a threshold level at the cell boundary at which a handoff would be taken. If we setup a level higher than -100dBm i.e -100dBm + ΔB and when the received signal reaches this level, a handoff request is initiated.

→ Let the value of Δ be 10dB i.e a level of -90dBm as the threshold level for requesting a handoff.

→ The Δ should be varied according to the path loss slope of the received signal strength (γ) and the velocity of vehicle V, so that the number of unnecessary handoffs can be reduced and the required handoffs can be completed successfully.

→ We have to calculate the velocity V of the

mobile unit based on the predicted LCR (Level crossing rate of signal strength) at a -10 dB. Based with respect to the RMS level which is at -90 dBm thus

$$v = \begin{cases} \dfrac{n\lambda}{\sqrt{2\pi}(0.21)} & \text{ft/sec} \cdot \text{at } -10\,dB \text{ level} \\ n\lambda & \text{mi/h} \end{cases}$$

where n is the LCR counting positive slopes

λ is the wavelength in feet, then the equation can be simplified as

$v(\text{mi/h}) = n$ at 850 MHz and a -10 dB level.