The Design and Debug of system

1. Attention matters: the wavelength and frequency of inter-cut signal should not overlay with main signal. At least should be apart 0.8nm. Considering the CATV EDFA sold in the market is a kind of gain-inequality products, the space between the two signals should be 4nm. Huatai HA5100 series in 1544~1560nm, flatness ≤1.0dB. HA4100 series in 1528~1560nm, flatness ≤1.0dB, can ignore the wavelength space.
2. Inter-cut system, the optical power that receiver received is the sum of two optical signal power. If receiving optical power is 0dBm, the two optical signal power are equal, then each actual receiving optical power is -3dBm. (CNR degradation 3dB).
3. Principle: reduce the inter-cut signal influence to the main signal, that make both signals' index all in the range of system allowed.
4. Method: distribute the main signal and inter-cut optical power ratio reasonably, means reduce inter-cut optical power and improve the modulation degree of inter-cut optical.
5. Power ration setting: different network adopt different optical power ratio to balance the system index of main signal and inter-cut signal. General system, the empirical value be: inter-cut optical power (dBm) -main signal optical power (dBm) =-6dBm. Now, if receiving optical power is 0 dBm, the inter-cut signal optical power = -7 dBm, main signal optical power=-1dBm. The main signal output level will be 2dB lower than when that without inter-cut.
6. Teat and verify: considering the system EDFA gain slope, how to test and verify the difference between signals' receiving optical power is 6dB, at the system receive end? Test the main signal's output level at system receive end, when inter-cut optical source OFF, the output level is 2dB lower than when it is ON.
7. Simple debug method: debug the optical power ratio, and make the output level of inter-cut optical transmitter source 2dB fluctuation at receive end under the ON/OFF conditions.
8. Improve inter-cut signal quality: when inter-cut optical power is 6dB lower

than main signal's, the output level of inter-cut signal will be 12dB lower than the main signal's. The way to make both output level equal is to improve the modulation level of inter-cut optical transmitter.

9. Inter-cut channel loading: Under the condition that the total modulation degree of inter-cut unchanged, as the modulation level is improved, the general channel loading of inter-cut optical transmitter should be: analog four channels, or digital 40 QAM channels.
10. Improve VOD rate:
    1）. FTTB、FTTH;
    2）. Each inter-cut set services less customers;
    3）. Improve transmission flow （64QAM→256QAM）;
    4）. Improve the compression ratio of program source.