

Digital Two-Way, Cellularized, ITFS: Potential Trouble Spots from an Engineering Perspective

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December 14, 1999

Existing ITFS Leased Access

- ◆ Easy to verify transmitter location, power, antenna type/orientation
- ◆ From a coverage standpoint, WCO's interests are generally identical to ITFS licensee's interests
- ◆ Number of WCO receive sites/customers have no interference impact on ITFS fixed receive sites

New Realities of Two-Way, Cellularized, Wireless Cable

- ◆ Now the number of upstream Response Stations has an impact on downstream service
- ◆ Difficult or impossible to verify independently the
 - u number of upstream transmitters
 - u their TPO/EIRP/antenna types
 - u number of transmitters that can be simultaneously on the air

What To Avoid

- ◆ Don't let your WCO create a situation where optimizing/improving its service can be done at the expense of your downstream ITFS service
- ◆ For example, upstream response stations TX on A1, ITFS downstream is on B1, WCO's downstreams are on A2 & B2

An Alternative, Self-Regulating Design

- ◆ WCO downstreams are on A1 & B1
- ◆ WCO upstream is on A2
- ◆ ITFS downstream is on B2
- ◆ Now inappropriately increasing the number or types of upstream TXs steps on WCO's downstream, as well; therefore, inherently self-regulating

Verify Design Adequacy

- ◆ Lease agreement should give you the right for an independent engineering review by your own engineering consultant
- ◆ WCO should be obligated to reimburse for the cost of this independent engineering review

'No Objection' Letters

- ◆ If RSA overlaps PSA, impossible to demonstrate protection of PSA, since each PSA can be filled with an unlimited number of hypothetical RX sites
- ◆ Collocation of hypothetical RX site with RSA upstream grid point takes FSPL to zero
- ◆ WCO must therefore have “no objection” letter from each affected ITFS licensee

Docket 97-217 Petition for Further Reconsideration Issues

- ◆ Retract rules allowing non-ITFS licensees to obtain boosters on ITFS frequencies
- ◆ ITFS RX sites >35 miles from TX should be eligible for protection, by waiver, upon showing of need
- ◆ Grandfathered ITFS RX sites entitled to BFO protection should retain that status if frequency swaps occur
- ◆ All ITFS/MDS licensees should be required to cooperate in resolving any interference from upstream Response Station transmitters

Docket 97-217 Appendix D

Unresolved Technical Issues

- ◆ $\sum \text{TX} \times \text{EIRP} \times \text{BW} \times \text{Simultaneous TXs}$ product equivalent only valid if no change in RSA
- ◆ Specific channels and the channel sharing being used are not defined in the Appendix D input file
- ◆ How are response transmitter points sorted into groups that share the same channel?

Docket 97-217 Appendix D

Unresolved Technical Issues

- ◆ Is the assumption that all points in a given hub sector share a channel, or is it a combination of a specific class & region?
- ◆ It is possible for the same channel to be used by more than one such group in a system; that is, used by more than one sector or class and region?

Docket 97-217 Appendix D

Unresolved Technical Issues

- ◆ The third full paragraph on Page 5 of Appendix D implies that a response transmitter grid point can be ignored if it does not have line-of-sight to a receiver being studied. Is this correct? If yes, why does the propagation model include a non-line-of-sight mode?

Docket 97-217 Appendix D Unresolved Technical Issues

- ◆ Why is it necessary to construct a -73 dBW/m² contour from the matrix of computed signal values described in the last Paragraph of Appendix D Page 7? Would it not be sufficient simply to examine all points falling within the protected region to determine if any exceed the signal strength limit?

Appendix D Errata

- ◆ Appendix D Equation (3) is adding unlike quantities and has the wrong sign for NF; therefore Equation (3) needs to be changed from

$$\text{PFD}_{\text{equiv}} = 10\log[10\exp(\text{PFD}_{\text{eff}}/10) + 10\exp([\text{PFD}_{\text{thermal}} - L_c + \text{NF} + G_{\text{ant}}]/10)]$$

to

$$\text{PFD}_{\text{equiv}} = 10\log[10\exp(\text{PFD}_{\text{eff}}/10) + 10\exp(\text{PFD}_{\text{thermal}} + L_c + \text{NF} - G_{\text{ant}} - 10\log(\lambda^2/4\pi))]$$

Appendix D Errata

- ◆ The constant 549.367 in Equation (20) should be 547.533. 549.367 implies a value for the speed of light of 301,804 km/sec, which is incorrect.

No “OET-69” Rosetta Stone

- ◆ Completely new methodology similarly adopted for DTV: 4 sq. km cells, new propagation model (Longley-Rice), receiving antenna directivity, dipole factors, etc.
- ◆ FCC therefore published OET-69 as a guide
- ◆ FCC provided April 17, 1997, baseline data on 1,600+ TV stations; allows checking implementation of custom software
- ◆ FCC declined to issue similar OET “Rosetta Stone” bulletin for new Docket 97-217 methodologies