

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

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(22) Explain the needs of your agency for a new system in the 700MHz spectrum and why those needs cannot be served by existing communications resources. Explain the deficiencies of your existing system which caused you to apply for new spectrum.

(23) System Justification: Explain why you require this spectrum.

(24) Implementation Time Table: Explain the proposed implementation schedule of your required system.

(25) Provide detailed information and supporting documentation showing the budget commitments for the completion of the system within the time allowed. (RPC expects a letter committing funds to system buildout.)

(26) Provide a time schedule of all significant implementation phases including funding, licensing, initial operation, channel loading and completion of your system.

(27) Provide an area of operation map detailing city/town/county/state boundaries and waterways. Identify any overlap coverage into neighboring cities/towns/counties/states and waterways. Provide marker identifications and a legend.

(28) Provide engineering studies as identified in “Procedure for Frequency Coordination”. The Technical Sub-committee plans to utilize software engineering known as “Comstudy”. The Longley-Rice model is used for coverage and interference prediction methodology (See Below - 1. Interference Determination/ Protection) because it is freely available in the public domain and has consistent implementations across propagation modeling programs of different sources, unlike Okumura Hata Davidson. All radiated and received power levels are referenced to a dipole antenna. The Technical Sub-committee will verify the accuracy of all engineering studies submitted to the committee. The engineering studies must be submitted in a version of “Comstudy” that is presently in use by the Technical Sub-committee. The Sub-committee in the future may change engineering software and will identify the software engineering required for submission in advance of any Window.

1. INTERFERENCE DETERMINATION/PROTECTION

This following procedure is the method that Region 8, 19 and 30 have agreed to for defining and evaluating “interference of a substantive nature” as specified in its letter “Mutual Agreement to protect against radio interference in the 700 MHz NPSPAC band.”
Recommended System Reliability

It is recommended that proposed facilities in Region 8, 19 and 30 be designed to provide 50 dB μ receive power levels for reliable portable coverage operations, and 40 dB μ receive power levels for reliable mobile coverage operations.

1.1 Coverage and Interference Prediction Methodology

Both TSB-88 (latest edition) and the Longley-Rice propagation model in median mode (50/50/50) shall be used to evaluate coverage and interference for proposed systems in either Region. The Longley-Rice model is used because it is freely available in the public domain and has consistent implementations across propagation modeling programs of different sources, unlike Okumura Hata Davidson. All radiated and received power levels are referenced to a dipole antenna.

1.2 Responsible Radiation Control and System Design

In order to promote responsible use of 700 MHz spectrum resources, all applicants are required to control unnecessary radio-frequency (RF) radiation. Therefore for all proposed facilities within the Region, 80% of the 50 dB μ Protected Service Area (PSA) must lie within the relevant jurisdictional boundary, plus an additional eight kilometer buffer zone. The 50 dB μ Protected Service Area shall be assessed using Longley Rice tile analyses.

1.3 Reliability Degradation Threshold

All licensed and previously-approved (by Regions 8, 19 and 30) facilities are required to provide co and adjacent channel interference protection to other similarly approved or licensed facilities.

Further, any new application or operations (which may consist of either single multiple facilities) must pose no more than 2.5% Area Reliability Degradation (ARD) at 90% reliability levels to any incumbent’s protected service area (PSA), with each individual PSA not to exceed a county-size jurisdiction. All facilities (including licensees and all approved allotments) in aggregate must pose no more than 5.0% cumulative area reliability degradation at 90% reliability levels to any incumbent’s protected service area.

The process for determining ARD is as follows:

- Compute the baseline Longley Rice 3-second tile coverage for each incumbent (Victim) co- and adjacent-channel licensee within their jurisdictional area. If the PSA coverage is provided by multiple sites, the coverage is assumed to be the most likely server coverage at each tile location,
- Evaluate the baseline total number of tiles within the Victim jurisdiction that achieve 90% or greater reliability levels using TSB-88 in conjunction with the deployed parameters for Channel Performance Criterion (CPC) at a delivered audio quality of 3.0, and receiver noise floor, and log-normal standard deviation (σ).
 - Example for typical parameters:
 - Receiver Noise Floor = -124 dBm
 - $CPC_f = 18$ dB
 - $\sigma = 7$ dB
 - These, along with the 40 dB μ (approximately -93 dBm at 807.5 MHz) give the following reliability throughout the service area:

$$R = 1 - Q[(-93 \text{ dBm} - (-124 \text{ dBm}) - 18 \text{ dB})/7 \text{ dB}] \approx 97\%,$$

where: R = Reliability in decimal, converted to percent, and

Q = Marcum's function, representing the cumulative area under a Gaussian distribution curve.

- Evaluate the received power levels of all proposed facilities at all tiles within the Victim jurisdictional area. Combine these into an equivalent interferer using the process outlined in TSB-88.
- Re-evaluate the total number of tiles within each Victim jurisdiction that achieve 90% or greater reliability levels, considering the effects of all proposed facilities.
- The ARD is defined as one minus the ratio of the number of tiles at 90% reliability (or greater) considering proposed facilities and the baseline number of tiles at 90% reliability (or greater).

1.4 Evaluation of Adjacent Channel Effects

The evaluation of adjacent channel interference will follow Sections 0 through 1.3, except that the effective radiated power of the adjacent channel proposed stations will be de-rated to account for Adjacent Channel Coupled Power Ratio (ACCPR) effects as specified in TRS-88. After this de-rating, they will be treated at the same time and using the method as if they as the co-channel interferers.

(29)

This form must be completed using the Region 19 Antenna Pattern Information Form (refer to Table 1, Horizontal Antenna Pattern, and Table 2, Vertical Antenna Pattern).

Please complete this form in full for each unique fixed-facility transmit antenna configuration (Antenna Number on the Form 601 Schedule-H) employed within the application. Be sure to include both the vertical and horizontal patterns with all gain units in dB and normalized to zero dBd at the main lobe.

This information supersedes the Schedule-H antenna information fields: Azimuth, Beam width, Polarization, and Gain.

Site Name: _____

Location Number: _____

Antenna Number: _____

Horizontal Antenna Pattern:

Horizontal antenna pattern from 0° to 360° degrees, with 0° and 360° referenced at true North, and numbered clockwise (CW).

Table 1, Horizontal Antenna Pattern

Pattern Reference (degrees)	Normalized Horizontal Antenna Pattern (dBd)
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Pattern Reference (degrees)	Normalized Horizontal Antenna Pattern (dBd)
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Site Name: _____

Location Number: _____

Antenna Number: _____

Vertical Antenna Pattern:

Elevation antenna pattern from -180° to +180° with 0° referenced at the horizon.

Table 2, Vertical Antenna Pattern

Pattern Reference (degrees)	Normalized Vertical Antenna Pattern (dBd)
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Pattern Reference (degrees)	Normalized Vertical Antenna Pattern (dBd)
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Application prepared by _____ Title _____
Preparer's Telephone Number _____ Fax # _____
Company Name _____
Company Address _____
Authorized Company Signature _____ Title _____
Printed Name _____ Date _____

Frequency Coordinator Name _____
Coordinator's Telephone Number _____ Fax # _____
Company Name _____
Company Address _____

The technical information contained in this application has been reviewed by me and is true and correct.

Frequency Coordinator's Signature _____ Title _____
Printed Name _____ Date _____

This agency has a firm intention to implement a new/expanded/modified 700MHz system with the time permitted by the FCC and to return for use by other public safety eligibles existing unneeded channels/frequencies. We will provide the committee with semi-annual copies of all progress reports. Should implementation not begin or be completed with the time approved by the FCC or channel loading projections are not achieved, the channels will be returned for re-allocation to other public safety agencies.

This agency will comply with all applicable requirements for common channel implementation and participation as required in the 700 MHz Plan – Region 19

The information contained in the application and attachments is true and correct.

Signature _____ Date _____
Typed Name _____ Title _____
Address _____
E-mail _____
Phone # _____ Fax # _____