State of New Hampshire

Department of Resources and Economic Development

Application for Electronic Communication Site Use

The information requested in this form will be used by the Department of Resources and Economic Development (DRED) and the DRED Communication Site Advisory Committee to evaluate your request for use of a State owned mountaintop communication site. DRED communications sites are administered under DRED Policy on Use and Management of Mountaintops for Communication Facilities (adopted November 7, 1989; revised April 15, 1998; Reviewed April 27, 2005) and Technical Requirements for Use of Communication Sites (adopted June 30, 1995; Reviewed April 27, 2005). *Applicants are advised to become thoroughly familiar with these documents before making an application.*

If the applicant should have any questions, please call the Division of Forests and Lands at 603-271-2214, ext 304.

Incomplete applications will be returned to the applicant.

Please return completed application and attachments to:

Chief of Communication
New Hampshire Department of Resources and Economic Development
Division of Forests and Lands
PO Box 1856, 172 Pembroke Road
Concord, NH 03302-1856

Official Use Only
Date Received:
Received by:
Site:
Tenant ID:
Antenna ID:
Facilities Location:
Activity:

1 Communications Site

2

Applicant
Organization:
Point of Contact:
Title:
Department:
Mail Address:
Address 2:

Address 3:

City: ***State:***

Zip:
Business Tel:
After Hours Tel:
Mobile Tel:

Fax:

E-mail:

Applicant's Project name/number:
Applicant's Site Designator:

Agent / Point of Contacts
Legal:
Tel:
Fax:
E-mail:
Technical:
Tel:

After Hrs Tel:

Mobile:

Fax:
E-mail:

Applicant authorized Electronics Repair Organization:
Name:

Address:

City: ***State:***

Zip:
Point of Contact:
Tel:
After Hrs Tel:
Fax:
Mobile::
E-mail:

3	***Statement of communication service to be provided and justification:***
4	***Description of alternatives considered and reasons they were not used:***
5	***Provide an analysis of the compatibility of the proposed equipment and frequencies with existing facilities, equipment and frequencies. This must include an Electromagnetic Compatibility (EMC) analysis as well as an Intermodulation Interference (Intermod) analysis of the frequencies involved.*** ***Include results as Attachment:_____*** ***Comments:***
6	***Provide an analysis and documentation of the results for the RF exposure hazard of the proposed installation radio frequency emissions. Show the FCC required information as well as the results for controlled and uncontrolled human exposure to radio frequency electromagnetic fields which the subject transmitters and antenna(s) generate. Supply diagrams depicting the boundaries of the uncontrolled exposure limit in relation to the subject antenna(s), one diagram for each horizontal and vertical planes. Supply diagrams of any human access restrictions necessary to prevent human exposure to fields greater than the FCC/OSHA uncontrolled limits, one diagram for each horizontal and vertical planes. Additionally, provide documentation as above, demonstrating the cumulative affects of the proposed installation with the existing exposure fields for this site. Demonstrate the proposed installation percentage contribution to the total RF exposure at the site.*** ***Include results as Attachment: _____*** ***Comments:***
7	***Attach complete plans and specifications of the proposed installation, including but not limited to:*** ***Buildings; type, size, appearance, materials*** ***Accessory Structures; type, dimensions, appearance, material*** ***Towers; type, make, model, serial #, material, drawings*** ***Generators, make, model, fuel, cooling, dimensions, clearance, location,*** ***Fuel Farm details; type, dimensions, capacity, protection*** ***Site access / improvements; required or offered*** ***Site additions/improvements required:*** ***Electrical Power Improvements*** ***Included as Attachment:***

8 ***Attach a detailed list of the requested equipment for the proposed installation. Include all items and include information for each individual item, including but not limited to:***
Transmitters; make, model, serial #, dimensions, power consumption, heat dissipation, power output
Receiver; make, model, serial #, dimensions, power consumption, heat dissipation
Duplexer; make, model, serial #, dimensions, power consumption, heat dissipation
Transmitter Combiner; make, model, serial #, dimensions, power consumption, heat dissipation
Receiver multicoupler; make, model, serial #, dimensions, power consumption, heat dissipation
Volume occupied for each item Service access dimensions and location for each item
Equipment desired location in shelter (include annotated floor plan)
Power requirements; total consumption, peak consumption, voltage, phases
Describe special needs, if any, such as environmental requirements, security, etc.
Coaxial Cable; make, model, nomenclature, length Coaxial Connectors, make, model, nomenclature, type
Coax jumper cables; make, model, nomenclature, length Coax Jumper connectors; make, model, nomenclature, type
Antenna; make, model, type, gain, pattern, dimensions, weight, wind loading, bending moment, wind area
Antenna; desired elevation AGL, minimum elevation AGL, desired leg mounting, main beam azimuth, include plan drawings for tower and site.
Antenna; ERP, special mounting, distance from tower, etc.
Details included as Attachment: _____
Comments:

9 ***Provide a detailed communications block diagram for the requested equipment and service. Include all directional paths, bearings, elevations, transmit levels, ERP, receive levels, frequencies, etc.***
Provide a detailed table of frequency correlation; transmit, receive, antenna, beam width, equipment unit, squelch CTCSS or DCSS, modulation type, modulation bandwidth, receiver threshold sensitivity, receiver passband, etc.
Included as Attachment: _____
Comments:

Complete the following table as a synopsis: Use additional page if necessary

Tx Freq	*Power*	*Rx Freq*	*Rx Level*	*Antenna*	*Gain*	*Pattern*	*Bearing*

10	***Will the requestor permit or join in equipment co-habitation in a common rack or cabinet?*** ***Yes:*** ☐ ***No:*** ☐ ***Comments:***
11	***Provide a copy of the FCC license for the requested communications site for the file and post one on the equipment at the site.*** ***Post complete tenant identification, equipment identification and all contact information on the equipment at the site.*** ***Included both as Attachment: _____ with this Application.*** ***Comments:***

STATE OF NEW HAMPSHIRE

DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT

TECHNICAL REQUIREMENTS FOR USE OF COMMUNICATION SITES

Adopted June 30, 1995
Reviewed April 27, 2005

R Sean O'Kane, Commissioner

P.O. Box 1856
Concord, N.H. 03302-1856

State of New Hampshire
Department of Resources and Economic Development
Technical Requirements For Use of Communication Sites

Introduction

The following outlines technical requirements for installation, operation and maintenance of communication equipment and appurtenances at Department of Resources and Economic Development (DRED) communication sites as required by Item III.H.6 of the DRED "Policy On Use and Management of Mountaintops for Communication Facilities". As stated in the policy, all requests for new communication equipment installations or modifications of existing equipment require review by the Communication Site Advisory Committee and approval by the Commissioner.

The Commissioner, with counsel from the Communication Site Advisory Committee, shall be the final authority in resolution of any conflicts between site users or in interpretation of these technical requirements and may require testing of user's equipment to determine compliance or to investigate possible sources of interference.

These requirements are in addition to any standards or conditions contained in the lease/use agreement.

These requirements shall apply to all new communications facilities and to existing facilities that are upgraded or expanded. The requirements may be waived or modified by the DRED Site Manager for facilities and/or users in existence at the date of adoption, as communication site conditions warrant.

Transmitters and Associated Equipment

A. Transmitters shall be equipped with isolators to provide the following minimum isolation to reduce the possibility of intermodulation interference.
   25 db (70 MHz to 220 MHz)
   50 db (220 MHz to 1000 MHz)

B. A Bandpass cavity shall be used between each antenna and associated transmitter or combiner.

C. R.F. Devices including duplexers, isolators, cavities, switches, etc. shall be located inside grounded cabinets where physically possible.

D. Ground strap to each cabinet shall be a minimum of #6 copper wire or solid copper strap at least 1 inch in width.

E. Transmission lines entering equipment cabinets shall do so via bulkhead connectors. Type "N" bulkhead connectors shall be used above 54 MHz.

F. Power and telephone or control lines shall be protected by grommets where they enter radio cabinets. Where high R.F. fields exist, telephone lines and control lines shall enter radio cabinets via RFI filtration devices.

G. The use of RG\8, RG\58, braided shield, single shield coax cable or aluminum shielded cable is not permitted. This includes cables located within cabinets.

Antenna System Requirements

A. Antenna systems must be approved by the DRED Site Manager prior to the commencement of installation work. The cost of any changes to the existing tower including structural work, tower painting, tower lighting, etc. will be paid for by the site user. Rearrangements of existing antennas will not be considered except under unusual circumstances.

B. The design of each proposed antenna systems shall take into account the following:

*Antenna location will be assigned by the DRED Site Manager based on available space, required radiation pattern, transmitter power and frequency, antenna type, mounting restrictions and interference considerations.

*Only antennas which provide a direct dc path to ground may be utilized.

*Antennas shall be equipped with coaxial lightning protectors meet ANSI standard 62.1. Lightning protectors shall be connected to site ground system with at least a #2 copper wire or two inch copper strap.

*R.F. link and control antennas will be assigned mounting positions as low on the tower as possible.

*Metal antenna mounting hardware will be hot dipped galvanized or stainless steel.

*Only solid copper jacketed cable will be permitted for antenna cable runs.

*Coax cable shall be individually attached to the tower legs or waveguide hangers. The location of coax cable runs will be assigned by the DRED Site Manager.

*Attachment of coax cable will be by stainless steel clamps or hangers spaced a maximum of three feet apart.

*The use of plastic " tie wraps " to support coax cable in any location is not permitted. The use of coating products that emit acetic acid are not permitted. Use of ultra-violet protected "tie wraps" are allowed on a temporary basis during construction or for temporary installations.

*Grounding kits with solid copper straps and mechanical compression shall be installed at top of tower, at point where coax cable departs the tower, and at the building entrance point. These clamps will be properly sealed to prevent corrosion at the coax cable connection. Stainless steel connectors will be used from the grounding kit to the tower.

*Horizontal runs of coax cable shall be protected by ice shields and supported every three feet with stainless steel clamps or hangers.

*Coax cable shall enter buildings via weatherproof cable entrance ports or cable mounting plates. Positions will be assigned by the DRED Site Manager. Ground Clamps will be used on both sides of this connection and will be connected to the site ground system.

*Coax cable runs located inside buildings will utilize existing cable racks or will be supported overhead by hangers.

Power Requirements:

A. Each site user will be responsible for the cost of installation of separately metered electrical service when such metering is required unless otherwise specified in the lease/use agreement.

B. The provisions of backup power by DRED will require approval of the DRED Site Manager.

C. Emergency generating equipment or battery backup units shall not be installed without approval of the DRED Site Manager.

D. Each new transmitter and equipment cabinet will be connected to a separately fused AC outlet in accordance with National and State Electrical codes.

E. Under no circumstances will one station be plugged into the accessory outlet of another cabinet.

F. All electrical installation work shall be in full compliance with National and State Electrical Codes.

Administrative Items

A. Should the DRED Site Manager determine that a frequency compatibility study must be performed prior to installation, it shall be done by an independent consulting firm, which has been approved by DRED. The cost of this study is the responsibility of the site user. A subsequent study may be required each time the site user proposes an additional frequency at the site.

B. The site user shall immediately cease operation if notified by the DRED that they are causing harmful interference.

C. The DRED Site Manager shall be provided with copies of all FCC license applications, current FCC licenses and equipment specifications.

D. The site user shall make no changes after the initial installation without prior written approval from the DRED Site Manager.

E. Equipment shall be maintained in such a manner as to prevent it from becoming a source of interference or a safety hazard.

F. Equipment shall have an ID tag attached, which shows licensee's name, address, call sign, frequency, tone squelch frequency and telephone number of person or organization responsible for maintenance work. Radio station licenses shall be posted for each transmitting station as required by FCC rules.

G. Speakers will be turned off except during periods of maintenance work.

H. Areas in and around the site user's equipment shall be kept clean and neat at all times. In addition, exterior areas including access roads, trails, and parking area shall be kept clean. Trash and unused materials shall be immediately removed from the site and not stored on the premises in any manner.

I. Smoking, open flame, or welding will not be permitted inside buildings.

J. Should the site user cause discharge of any Fire Protection System, they will be responsible for all costs
associated with recharging the system, cleaning the building and repairing damaged equipment.

K. If the building has an alarm system installed, the site user will notify designated Alarm Center when entering or leaving building in accordance with posted instructions.

L. Site access shall be as designated in and subject to restrictions as described in the lease\use agreement. The DRED will not be responsible for plowing of access roads or trail entrances to the site unless specified in lease/use agreement.

M. Prior to the signing of any lease, a joint visit of the site will be made by the proposed site user and the DRED Site Manager. Any additional special technical requirements not covered in this document will be determined at this meeting.

N. When a lease is terminated for any reason, the site user will remove all equipment including antennas and feed lines within thirty days and will be responsible for any work necessary to return site to its previously existing condition. Should the site user fail to do so, then DRED will arrange to have work completed and will bill the site user for this work.

EXHIBIT I

Relevant sections of the "American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz" (ANSI C95.1-1982) are reprinted below by permission. This ANSI standard has been copyrighted (1982) by the Institute of Electrical and Electronics Engineers, Inc., New York, N.Y. Complete copies of this and other ANSI publications are available from:

American National Standards Institute
1430 Broadway
New York, NY 10018
(212) 354-3300 or (212) 354-3473

Standard Sales-IEEE
or 445 Hoes Lane
Piscataway, NJ 08854

AMERICAN NATIONAL STANDARD SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ELECTROMAGNETIC FIELDS, 300 kHz to 100 GHz

1. Scope and Purpose

Recommendations are made to prevent possible harmful effects in human beings exposed to electromagnetic fields in the frequency range from 300 kHz to 100 GHz. These recommendations are intended to apply to non-occupational as well as to occupational exposures. These recommendations are not intended to apply to the purposeful exposure of patients by or under the direction of practitioners of the healing arts.

2. Definitions

Radio frequency protection guides (RFPG). The radio frequency field strengths or equivalent plane wave power densities which should not be exceeded without (1) careful consideration of the reasons for doing so, (2) careful estimation of the increased energy deposition in the human body, and (3) careful consideration of the increased risk of unwanted biological effects.

Specific absorption rate (SAR). The time rate at which radio frequency electromagnetic energy is imparted to an element of mass of a biological body.

3. References [not reprinted here; see original]

4. Recommendations

4.1 Radio Frequency Protection Guides. For human exposure to electromagnetic energy at radio frequencies from 300 kHz to 100 GHz, the protection guides, in terms of the mean squared electric (E^2) and magnetic (H^2) field strengths and in terms of the equivalent plane wave free space power density, as a function of frequency, are given in Table 1.

For near field exposures, the only applicable protection guides are the mean squared electric and magnetic field strengths as given in Table 1, columns 2 and 3. For convenience, these guides may be expressed as the equivalent plane wave power density, given in Table 1, column 4.

For mixed or broadband fields at a number of frequencies for which there are different values of protection guides, the fraction of the radio frequency protection guide incurred within each frequency interval should be determined, and the sum of all such fractions should not exceed unity.

Table 1

RADIO FREQUENCY PROTECTION GUIDES

1	2	3	4
Frequency Range (MHz)	Electric Field Strength E^2 (V^2/m^2)	Magnetic Field Strength H^2 (A^2/m^2)	Power Density (mW/cm^2)
0.3-3	400,000	2.5	100
3-30	4,000($900/f^2$)	0.025($900/f^2$)	$900/f^2$
30-300	4,000	0.025	1.0
300-1500	4,000(f/300)	0.025(f/300)	f/300
1500-100,000	20,000	0.125	5.0

Note: f = frequency in megahertz (MHz)

E^2 = electric field squared

H^2 = magnetic field squared

V^2/m^2 = volts squared per meter squared

A^2/m^2 = amperes squared per meter squared

mW/cm^2 = milliwatts per centimeter squared

4.2 Exclusions

(1) At frequencies between 300 kHz and 100 GHz, the protection guides may be exceeded if the exposure conditions can be shown by laboratory procedures to produce specific absorption rates (SARs) below 0.4 W/kg as averaged over the whole body, and spatial peak SAR values below 8 W/kg as averaged over any one gram of tissue.

(2) At frequencies between 300 kHz and 1 GHz, the protection guides may be exceeded if the radio frequency input power of the radiating device is seven watts or less.

4.3 Measurements

(1) For both pulsed and non-pulsed fields, the power density, the squares of the field strengths, and the values of specific absorption rates (SARs) or input power, as applicable, are averaged over any 0.1 h period. The time-averaged values should not exceed the values given in Table 1 or in the Exclusions, 4.2.

(2) Measurements to determine adherence to the recommended protection guides shall be made at distances 5 cm or greater from any object [refer to ANSI C95.3-1973, American National Standard Techniques and Instrumentation for the Measurement of Potentially Hazardous Electromagnetic Radiation at Microwave Frequencies and ANSI C95.5-1981, American National Standard Recommended Practice for Measurement of Hazardous Electromagnetic Fields-RF and Microwave].

5. Explanation

Exposure to electromagnetic fields in the frequency range under consideration is but one of the several sources of energy input into the body, which requires wide ranges of energy production and dissipation in order to function. For situations involving unrestricted exposure of the body, the radio frequency protection guides are believed to result in energy deposition averaged over the entire body mass for any 0.1 h period of about 144 joules per kilogram (J/kg) or less. This is equivalent to a specific absorption rate (SAR) of about 0.40 watts per kilogram (W/kg) or less, as spatially and temporally averaged over the entire body mass.

Biological effects data applicable to humans for all possible combinations of frequency and modulation do not exist. The radio frequency protection guide, therefore, has been based on the best available interpretations of the literature and is intended to eliminate adverse effects on the functioning of the human body.

Exclusion criterion (2) to the protection guides can be used in relation to fields from low power devices such as hand-held, mobile, and marine radio transceivers. These devices may emit localized fields exceeding the protection guides, but will result in a significantly lower rate of energy absorption than allowed for the whole body average. Thus, exposure to fields emitted by devices operating at 1 GHz or lower and at less than 7 W output power would not be restricted. Exposure to fields from devices with greater output power or operating at frequencies above 1 GHz require a case-by-case analysis to determine if exclusion criterion (1) is applicable.

Because of the limitations of the biological effects data base, these guides are offered as upper limits of exposure, particularly for the population at large. Where exposure conditions are not precisely known or controlled, exposure reduction should be accomplished by reliable means to values as low as are reasonably achievable. Exposures slightly in excess of the radio frequency protection guides are not necessarily harmful, however, such exposures are <u>not</u> desirable and should be prevented wherever possible.

6. <u>Rationale</u>

[not reprinted here; see original ANSI document for rationale]