

such as between computing devices within a room or in adjoining rooms. The 5.250–5.350 GHz sub-band may be used indoors and outdoors and is limited to 1 watt e.i.r.p. This sub-band is shared with the Federal Government Radiolocation Service, Earth Exploration Satellite Service and Space Research Service. This U–NII sub-band is suitable for communications links both within and between buildings such as for campus-wide local area networks. The 5.725–5.825 GHz sub-band may be used indoors and outdoors with power levels up to 4 watts e.i.r.p. This U–NII sub-band is shared with Federal Government Radiolocation, Amateur, ISM, and other part 15 devices and is suitable for communications links within and among buildings and over long distances through use of high-gain antennas.

7. We propose to add the 5.470–5.725 GHz band to the U–NII bands with the same technical requirements that apply to the existing 5.250–5.350 GHz U–NII sub-band. This is consistent with the WECA petition and the U.S. position for the upcoming WRC–03. The Federal Government believes that the power must be limited to 1 watt e.i.r.p. to protect incumbent systems. We also believe that this will best provide for communications among devices within and among buildings where demand is greatest. We expect that the 100 MHz of spectrum that is already available at 5.725–5.825 GHz will remain sufficient for higher power operations. We note in particular that operations over longer distances employ directional antennas that allow for high reuse and sharing of the spectrum, which mitigates the need for additional spectrum for these types of operations. We seek comment on this analysis.

8. ARRL argues that WECA, in its petition, has not demonstrated that U–NII devices operating in the 5.650–5.725 GHz band will avoid causing interference to the Amateur Radio service, which operates on a secondary basis in this band. Our review of ARRL's web site indicates that amateur use of this band is limited to propagation beacons and possibly some limited satellite use. Roeder comments that there is little ready made Amateur equipment for this band and that there are only a few rare mountain top users of this band. We observe that amateurs already share the 5.725–5.825 GHz band with U–NII devices and we are unaware of any complaints of interference. Further, we have proposed to permit a lower e.i.r.p. for U–NII devices operating in the 5.470–5.725 GHz band (*i.e.*, 1 watt e.i.r.p.) than for the existing 5.725–5.825 GHz band (*i.e.*, 4 watts

e.i.r.p.). Therefore, we believe that U–NII devices can operate in 5.650–5.725 GHz band without causing interference. Finally, U–NII devices in this band would continue to operate under part 15 of our rules and would be required to eliminate any harmful interference that may occur to the Amateur Radio service. We tentatively conclude that the proposals in the NPRM are adequate to protect the Amateur Radio service from interference. We seek comment on this tentative conclusion.

9. In addition to applying the existing technical requirements for the 5.250–5.350 GHz sub-band to the new 5.470–5.725 GHz band, to ensure protection to existing vital DoD radar operations, we are proposing that U–NII devices operating in both the existing 5.250–5.350 GHz sub-band and the new 5.470–5.725 GHz sub-band employ a listen-before-talk mechanism called dynamic frequency selection (DFS). DFS is an interference avoidance mechanism. Prior to the start of any transmissions, and through constant monitoring, the device (*e.g.*, RLAN) equipped with such a mechanism monitors the radio environment for a radar's presence. If the U–NII device determines that a radar is present, it either moves to another channel or enters a sleep mode if no channels are available. We proposed that U–NII devices be required to continuously monitor their environment for the presence of radars both prior to and during operation. DoD concurs that the use of DFS at the thresholds proposed will provide the necessary protection for its vital radar systems.

10. For systems, where multiple devices operate under a central controller, we propose that only the central controller be required to have DFS capability. We recognize that there may be devices or architectures developed, where remote devices are not under the control of a master device. We seek comment on requiring such devices to have DFS. We also invite comment on how to identify remote units that operate only under the control of a central controller.

11. The U–NII device's ability to reliably detect a radar's presence in the channel depends greatly on the pulse characteristics of the radar. The time for which the radar occupies the U–NII channel (dwell time) also influences the detection probability. The problem arises when the dwell time is very short as is the case for frequency hopping radars. In this case, the subject radar signal is characterized as a receive signal strength (RSS) equal to or greater than the DFS detection threshold level within the U–NII device's channel bandwidth (*e.g.*, typically 18 MHz for

devices operating under IEEE 802.11(a)). The radar signal has a bandwidth of 1 MHz and a pulse repetition rate (PRR) in the range 200–4000 pulses/s, where the nominal pulse width is in the range of 1 to 20 microseconds. We seek comment on the minimum number of pulses and the observation time required for reliable detection.

12. We are also proposing to require a transmit power control (TPC) mechanism in the 5.470–5.725 GHz band to further reduce the potential for impact on EESS and SRS operations. TPC is a feature intended to adjust the transmitter's output power based on the signal level at the receiver. TPC will allow the transmitter to operate at less than the maximum power for most of the time. As the signal level at the receiver rises or falls, the transmit power will be decreased or increased as needed. Because TPC equipped devices adjust their transmit power to the minimum necessary to achieve the desired performance, the average interference power from a large number of devices is reduced, the power consumption is minimized and network capacity is increased. Consistent with the U.S. proposals to the WRC–03, we are proposing that U–NII devices employ a TPC mechanism that will ensure a 6 dB drop in power when triggered. We seek comment on what the appropriate triggering mechanism will be. For example, should TPC seek to keep a receiver parameter such as received signal strength, bit error rate, or block error rate below a certain threshold? How long will a pair of U–NII devices have to adjust their link powers? Will it be necessary to require U–NII devices to employ TPC if their maximum power is 3 dB or more below the maximum permitted under the rules? How should TPC be applied to system configurations where multiple devices may operate under the control of a central device.

13. *Test procedures.* We seek comment on appropriate test procedures needed to ensure compliance with the DFS and TPC requirements proposed in this proceeding. We note that the operational requirements for DFS are well defined in the applicable industry standards. We observe that while TPC has been agreed to as a general requirement, its operational details are still under development. Therefore, we particularly seek comment on the means by which devices can be tested for compliance with TPC requirements to implement reduced power without placing unnecessary restrictions on device design. We also seek comment on the extent to which devices under development that may have unique or