23. In order to promote greater spectral efficiency, the Commission adopts efficiency standards for new radios. Although different efficiency standards were proposed for the VHF and UHF bands, the Commission adopts a common standard for all the refarming bands. In accordance with the transition dates for equipment in the 150–174 MHz VHF and 421–512 MHz UHF bands, the Commission adopts a spectrum efficiency standard of one voice channel per 12.5 kHz of channel bandwidth for equipment type accepted after August 1, 1996, and a spectrum efficiency standard of one voice channel per 6.25 kHz for equipment type accepted after January 1, 2005. Additionally, after August 1, 1996, equipment designed for data operation that uses more than a 6.25 kHz channel bandwidth, must meet a minimum efficiency standard of at least 0.768 bits per second per Hertz. At the chosen standard of 0.768 bps/Hz, the 6.25 kHz equipment will have a data rate of 4800 bps, and the 12.5 kHz equipment will have a data rate of 9600 bps. These are standard data rates. This standard will be incorporated into the type acceptance process by having equipment manufacturers certify as part of their application for type acceptance that their equipment meets the spectrum efficiency standard.

24. The Commission, in order to promote low-cost and low-power entry level communications, is making six additional frequencies in the 150 MHz band available to the Business Radio Service for low-power and itinerant operations. These are: 151.700 MHz, 151.760 MHz, and 154.5275 for itinerant use, and 151.820 MHz, 151.880 MHz, and 151.940 MHz for low-power use. Operation on these new low power frequencies will be limited to a maximum channel bandwidth of 12.5 kHz and a maximum output power of 1 watt. Also, after January 1, 2005, the Commission will continue to allow type acceptance of 12.5 kHz single mode radios that are designed to only operate on any of the low power and itinerant frequencies and have an output power of less than 2 watts.

25. Radio transmitters, when keyed on, require a very short period of time (in milliseconds) to ''warm-up'' and attain their designed operating frequency. During this short period of off-frequency operation, noise ''chirps'' are transmitted. A similar transient frequency behavior occurs when the transmitter is keyed off. Transmitters designed for digital transmissions produce in-band signals very close to an adjacent channel. Thus, noise ''chirps'' can cause interference to adjacent channel operations. The Commission proposed certain criteria to limit the amplitude of this type of noise. The comments indicate support for limiting these emissions. In order to assure that ''chirps'' do not cause excessive interfere to other land mobile licensees and to television receivers operating in adjacent bands, manufacturers must limit ''chirps'' in their equipment. Therefore, the Commission is adopting standards similar to those used by industry for transient frequency behavior for equipment designed to operate on 25, 12.5, or 6.25 kHz channel bandwidths.

26. The Commission also adopts several miscellaneous technical changes to 47 CFR Part 90. The Commission will allow the licensees in the Police Radio Service to use direct sequence spread spectrum during covert operations in addition to the currently allowed frequency hopping spread spectrum. Also, the Commission adopts new out-of-band emission limitations for transmitters licensed in the Business Radio Service that do not exceed 120 milliwatts in output power that are otherwise exempt from some of the technical standards of 47 CFR Part 90.

27. The rules are set forth at the end of this document.

28. The rules contained herein have been analyzed with respect to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., and found to contain no new or modified form, information collection, and/or record keeping, labeling, disclosure, or record retention requirements and will not increase or decrease burden hours imposed on the public.

29. This *Report and Order* is issued under the authority of sections 4(i) and 303(r) of the Communications Act of 1934 as amended, 47 U.S.C. 154(i) and 303(r).

Final Regulatory Flexibility Analysis

Need and Purpose of This Action

This *Report and Order* amends Part 90 of the Commission's rules governing the PLMR services. Specifically, this *Report and Order:* 1) increases channel efficiency by splitting existing channels between 150 and 512 MHz; 2) provides users technical flexibility to convert to narrowband technology; 3) introduces new power/antenna height limitations that will permit advanced technologies and reduce interference; 4) specifies new technical standards for emission masks, frequency stability, and spectrum efficiency. These actions will reduce congestion, meet future communications capacity needs and generally permit, facilitate and encourage licensees to be spectrum efficient. These proposals will not unduly burden the public or increase administrative costs.

Summary of Issues Raised by Public Comments in Response to the Initial Regulatory Flexibility Analysis

No party addressed the Initial Regulatory Flexibility Analysis (IRFA), although several parties, including AAR and ATA, produced higher per unit estimates of the cost of reducing transmitter power and deviation.

Significant Alternatives Considered and Rejected

Several proposals were suggested by commenters regarding the appropriate *channelization plan, transition period,* and *transmitter power/antenna heights.* One alternative which received strong support from the user community was to adopt a 12.5 kHz channelization plan. Another alternative presented the view that narrowband is more efficient than 12.5 kHz technology and recommended that the Commission convert to this technology to make the most gains in relieving spectrum congestion. Based on the record before us, we adopt a flexible channelization plan which is a combination of the above plans and considers the needs and concerns of users. The plan gives users the option of converting directly to narrowband technology or allowing users to first use 12.5 kHz equipment and thereafter migrate to narrowband technology. The Commission also reviewed varying proposals from users, ranging from 10 to 26 years, regarding the appropriate transition period for implementation of the channelization plan. We again adopt a flexible approach which permits users to amortize existing investments over standard equipment life cycles. The rules adopted impose minimal hardship on users, as they consider the significant costs users have already expended in imbedded equipment. The Commission also considered reducing the number of radio services. Generally, commenters did not agree on how many radio services should exist, which is a central issue in this debate. Therefore, in this document, because of the outstanding debate on this issue and several other issues, which need further discussion, we will not consolidate the radio services in this Report and Order. We believe that the move toward consolidation has merit and frequency coordinators of the radio services can greatly assist in the efficient implementation of the changes within this document. Consequently, we will allow frequency coordinators to submit a consolidation plan to the Commission