

IEEE P802.22
Wireless RANs

**DRAFT 5 Criteria for 802.22 Proposed PAR on Enhanced Protection
of Part 74 Devices**

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Abstract

This document contains the "5 Criteria" information for the IEEE 802 Executive Committee's review, regarding a PAR proposed by 802.22 for approval at the November 2005 IEEE 802 Plenary.

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CRITERIA FOR STANDARDS DEVELOPMENT (FIVE CRITERIA)

Broad Market Potential

A standards project authorized by IEEE 802 shall have a broad market potential. Specifically, it shall have the potential for:

- a) Broad sets of applicability.*
- b) Multiple vendors and numerous users.*
- c) Balanced costs (LAN versus attached stations).*

IEEE P802.22 is developing a standard for use, on a strictly non-interfering basis, for Wireless Regional Area Networks (“WRANs”) using a cognitive radio-based approach, with the target spectrum being geographically unused channels allocated to the TV Broadcast Service.

In the course of our studies, it has become apparent that certain low-powered licensed devices such as wireless microphones (licensed under Part 74 of the FCC rules in the US and nominally equivalent regulations in other regulatory domains around the world) that are critical to the production of television programming are also more difficult to detect and protect (avoid) than TV broadcast stations, due their low power and other factors such as body absorption, etc.

The proposed PAR is intended to develop improved and standardized methods of detecting and protecting such “Part 74” devices. Because of the significant global use of such devices, there is significant need and market potential.

Development of enhanced methods for detecting and protecting Part 74 devices will facilitate the wider deployment of 802.22 networks and will be applicable to other devices and applications that regulatory bodies may, in the future, allow to operate in the TV bands on a non-interfering basis.

Compatibility

IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management, and Interworking documents as follows: 802 Overview and Architecture, 802.1D, 802.1Q, and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802. Each standard in the IEEE 802 family of standards shall include a definition of managed objects which are compatible with systems management standards.

The proposed standard will define methods for enhancing the ability of IEEE 802.22 devices to detect and protect the previously described low-power licensed device operations. It is believed that these methods will, by extension be usable by, or readily adaptable to, other 802 and non-802 license-exempt devices that may be allowed access to the TV bands by the FCC and other regulatory agencies around the world in the future.

One method that has been suggested is a “beacon” device/network that would be deployed and activated on an as-needed basis by operators of Part 74 devices to provide a more readily detectable signal with a common signalling format that would facilitate the detection and avoidance of Part 74 operations by IEEE 802.22 devices and such other devices as may be permitted to operate in the TV bands. Other methods may be possible and are not precluded by the scope of the proposed PAR.

At the present time, it is not believed that there will be a need or a requirement for a device such as a "Part 74 beacon" (if that, in fact, is the result of the work proposed by the PAR) to interoperate with other 802 devices in the normal sense, nor is it envisioned that such a device would need to bridge to other 802 devices at the MAC layer or above, provide internet connectivity, etc.

If, during the course of the work proposed in the PAR it is determined that such requirements exist, they will be implemented in a way that meets the 802 compatibility requirements.

Distinct Identity

Each IEEE 802 standard shall have a distinct identity. To achieve this, each authorized project shall be:

- a) Substantially different from other IEEE 802 standards.*
- b) One unique solution per problem (not two solutions to a problem).*
- c) Easy for the document reader to select the relevant specification.*

The solution, whether it be a "Part 74 beacon" or some other method will be new and unique from existing 802 standards. A simple, standardized method of enhancing the ability of 802.22 devices to detect and protect Part 74 devices and their operations will inherently have a distinct identity, since this specific problem and its solution have not previously been addressed.

Technical Feasibility

For a project to be authorized, it shall be able to show its technical feasibility. At a minimum, the proposed project shall show:

- a) Demonstrated system feasibility.*
- b) Proven technology, reasonable testing.*
- c) Confidence in reliability.*

The "beacon" concept mentioned above is clearly technically feasible, being based on a simple low-rate, narrow-band FSK technique that would be very simple and cost-effective to implement and easy for 802.22 devices and other devices to detect and interpret.

While, as stated above, the "beacon" has not been selected as "the" solution, and the scope of the proposed PAR does not preclude the selection of another solution, the "beacon" concept clearly illustrates that there are technically feasible solutions. Other solutions considered in the course of the work proposed by the PAR would be required to likewise be demonstrably technically feasible.

Economic Feasibility

For a project to be authorized, it shall be able to show economic feasibility (so far as can reasonably be estimated), for its intended applications. At a minimum, the proposed project shall show:

- a) Known cost factors, reliable data.*
- b) Reasonable cost for performance.*
- c) Consideration of installation costs.*

The economic feasibility of IEEE 802 wireless devices is well-documented. As stated above under "Technical Feasibility," at least one possible solution has already been described and that solution would be simple, economical, and easily deployable. Any other solutions considered in the course of the work proposed by the PAR would be required to likewise be demonstrably economically feasible.

References: