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| Project                      | <b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >  |   |
| Title                        | <b>Rebuttal of Task Group Resolution on Comments 0034, 0035</b>   |   |
| Date Submitted               | <b>2002-05-15</b>   |   |
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| Re:                          | Comments 0034 and 0035 in the Comment database <a href="#">IEEE 802.16-02/01r13</a>   |   |
| Abstract                     | This document is my rebuttal of the Task Group's rejection of my comments 0034 and 0035, and maintains my "disapproval" voting status based on these technically binding comments. The rebuttal takes into account the updated rejection text proposed in Contributions <a href="#">C802.16a-02/52</a> and <a href="#">C802.16a-02/53</a>   |   |
| Purpose                      | This information can be reviewed by the WG during Meeting #19 (Calgary) and I will then reconsider the status of my comments / disapproval for any future Draft of the 802.16a Standard.  |   |
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| Patent Policy and Procedures | <p>The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures (Version 1.0) &lt;<a href="http://ieee802.org/16/ipr/patents/policy.html">http://ieee802.org/16/ipr/patents/policy.html</a>&gt;, including the statement "IEEE standards may include the known use of patent(s), including patent applications, if there is technical justification in the opinion of the standards-developing committee and provided the IEEE receives assurance from the patent holder that it will license applicants under reasonable terms and conditions for the purpose of implementing the standard."</p> <p>Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair &lt;<a href="mailto:r.b.marks@ieee.org">mailto:r.b.marks@ieee.org</a>&gt; as early as possible, in written or electronic form, of any patents (granted or under application) that may cover technology that is under consideration by or has been approved by IEEE 802.16. The Chair will disclose this notification via the IEEE 802.16 web site &lt;<a href="http://ieee802.org/16/ipr/patents/notices">http://ieee802.org/16/ipr/patents/notices</a>&gt;.</p> |   |

**Rebuttal of Task Group Resolution on Comments 0034, 0035***David Trinkwon***1. Background**

Comments 0034 (License Exempt) and 0035 (Licensed) were based on Draft D2 and essentially say that because IEEE802 - through its Working Groups 802.16 ( and also 802.11 for the license exempt bands) - is defining several air interface solutions as part of the proposed Draft Standard, the Standard must include information which characterizes / differentiates them from each other for the benefit of the intended users of the standard. Although there was some improvement in the number of alternatives with the current (D3) Draft there are still the following (proposed) "Standard" air interfaces defined by IEEE 802, each of which is implied to be incompatible with any other, especially from a CPE perspective.

**License Exempt Bands (TDD Only) :**

- a) 802.11 variants
- b) 802.16 OFDM PMP
- c) 802.16 OFDM Mesh
- d) 802.16 OFDMA PMP
- e) 802.16 OFDMA Mesh

**Licensed Bands :**

- a) Single Carrier (10 – 66GHz) TDD, HFDD and FDD (which includes 10.5 GHz)
- b) Single Carrier 2 PMP (2 – 11 GHz) TDD, HFDD and FDD (which also includes 10.5 GHz)
- c) OFDM PMP TDD, HFDD and FDD (2 – 11 GHz)
- d) OFDMA PMP TDD, HFDD and FDD with OFDMA2 option (2 – 11 GHz)

The intention of the original IEEE 802.16 Project Authorizations was to develop a single, interoperable air interface (PHY + MAC) for BWA applications (actually, one each for licensed and license exempt bands). The PAR expectation was that a (single) standard would enable economies of development and scale and thereby stimulate a higher volume multi-vendor market to the greater benefit of the end users, service providers and system vendors concerned. To this end (at least for the licensed bands under the original TG3) significant Task Group effort was invested in generating and approving a Functional Requirements Document (FRD), Channel Models and Traffic Models to be used as the basis for evaluating the competing proposals, comparing different solutions and (eventually) characterizing the resultant Standard for the benefit of the intended users of the Standard.

The subsequent Task Group processes then avoided carrying out detailed evaluations / comparisons against the approved FRD and Channel / Traffic Models and instead accepted

all submitted technology proposals for inclusion (including a Mesh topology option for license exempt bands) and focused on the subsequent rationalization / consolidation of options / parameters leading to the current “*smorgasbord*” of alternative air interfaces which are not interoperable (one with another) and do not visibly support multi-vendor CPE compatibility between the alternatives.

Unfortunately, the Task Group has largely been driven by the technology and vendor interests of the participating members and received negligible input from or on behalf of Service Providers or the WCAI, although they each claim to want a (single / multivendor) Standard.

### **Basis of Disapproval**

There are three bases for my Disapproval of the current Draft D3, symbolized by my Comments 0034 and 0035.

- i) **Intention of PAR** : The Draft does NOT meet the PAR intention / expectation of stimulating a high volume multi-vendor market based on a (single) interoperable air interface standard derived by an open process of technical evaluation / compliance against approved FRD, Channel and Traffic Models.
- ii) **Characterization of Alternatives** : Given that the 802.16 Working Group was unable or unwilling to propose a single standard interoperable air interface (or one each for licensed and license exempt bands) and believed it necessary to specify a number of non-interoperable alternatives then (in my opinion) it behoves the Working Group to explain its reasoning for including each of the alternatives  
*(see ExCom comment ... Note that under Distinct Identity of the Five Criteria one requirement is: "Easy for the document reader to select the relevant specification." so it is a reasonable request that should have gotten a more serious response).*
- iii) **Market Need** : So far, the volume market for BWA has failed to materialize, despite significant expenditures by equipment vendors, service providers and spectrum authorities over several years. A (technology) standard which inadequately recognizes or addresses the significant coverage, capacity and cost issues which inhibit the success of a service provider business case or deployment scenario is not worth having. The current draft falls within this category, both through the lack of relevant or timely Service Provider input, the technology bias / focus of the Task Group participants and the procedural distortions used to publish a “lowest common denominator ” Standard document in accordance with a pre-defined schedule. In my opinion, this resultant “Standard” will be irrelevant to the (potential) market. This fact would become more apparent if proper data was provided to characterize / differentiate the proposed alternative standards.

## 2. Basis of Rejections

The original Task Group rejection of Comments 0034, 0035 at Meeting #18 (St Louis) were based on a combination of three arguments :

- i) Rejected due to lack of text proposed for the document : The comments actually proposed that an *ad hoc* group should be formed to generate the agreed text, based on previously approved criteria / documents and technical data (e.g. from simulations or estimates) to be submitted.
- ii) Rejected due to foreseeable lack of consensus on performance data : The purpose of the proposed activity (and *ad hoc* group ) was precisely to overcome any difficulty of achieving consensus or consistency between the alternative “standards”. Some commenters stated that this would / should be done outside the standard, or by system vendors, or “the marketplace”. In my opinion, this is a cop-out. If 50 – 100 technical professionals (experts) who have spent almost two years developing “The standard(s)” can’t figure out how to characterize it/them in a consistent, useful or accurate way, then what chance would an individual Service Provider or Regulatory Authority have, especially when faced with a range of system providers and technology vendors with competing claims or views ?
- iii) Rejected due to lack of time : This refers to the lack of time available for compiling the information through contributions or an *ad hoc* group. The only reason for a lack of time is because the pre-defined development schedule doesn’t include any such time, because it was based on an intention / expectation of creating a single air interface standard which should have been based on detailed technical characterization etc. The correct solution is to modify the development schedule to include the time needed to complete the job properly.

## 3. Rebuttal of Task Group Resolutions

In my opinion, the Task Group resolutions of rejecting comments 0034 and 0035 were based on the imposed scheduling deadlines, and a desire not to “Rock the Boat” and expose strengths or weaknesses of the alternative “standards” compared with the FRD, Channel and Traffic Models or other objective criteria. I therefore did not agree to forward such a draft to Sponsor Ballot and eventual publication as an “IEEE Standard” because it would be irrelevant to the aims of helping Service Providers and Regulatory Authorities stimulate a successful high volume market based on optimized high coverage, high capacity, cost effective multi-vendor equipment solutions.

I therefore retained my “Disapprove” voting status for the Working Group Letter Ballot #4.

## 4. Further Input and Considerations

Following the rejection of the Motion to go to sponsor Ballot with D3 (partly because of perceived inadequate Rejection Comments for some of the “Disapprove” comments – including 0034 and 0035) a number of TG members have contributed Doc [C802.16a-02/52](#) containing a series of proposed Rejection Comments to address the concerns of the 802

Executive Committee who considered and rejected the Motion to go to Sponsor Ballot with D3.

The 802.16 Chair, Roger Marks, has in turn submitted a contribution Doc [C802.16a-02/53](#) which further addresses the issues (including the proposals submitted in Doc [C802.16a-02/52](#) ) and offers a revised set of proposed rejection comments.

**i) Comment 0034**

I agree with the criticism by Marks of the proposals in Doc 52 and have some additional criticisms and disagreements of my own. However, I additionally disagree with Marks' proposed rejection

*(...In license-exempt bands, 256-point OFDM has been defined as mandatory. Therefore, the WG believes that the comment has been superseded and is no longer relevant.)*

because although there are now less alternatives (from an interoperability / CPE compatibility basis) than in D2, there are still at least five non-interoperable standards (see Par. 1(a)-(e) above) proposed by IEEE 802 for license exempt bands, with no information or guidance as to the relative performance or deployment characteristics of each.

**ii) Comment 0035**

I agree with the criticism by Marks of the proposals in Doc 52 and have some additional criticisms and disagreements of my own. However, I additionally disagree with Marks' proposed rejection

*(...The set of mode options has been reduced to the minimum acceptable to the WG, which believes that a variety of alternatives is required to support operation in the many regulatory and service environments in which the standard may be applied. The WG appreciates the suggestion of a summary table and has added one (Table XX).*

*The WG does not accept the request to form an ad hoc group to develop a comparative performance study. The WG believes that such a group would not reach consensus. Potential users must be willing to make their own decisions based on their own usage scenarios..)*

because :

- i. I haven't yet seen a Table XX which includes a summary of the main characteristics / differentiators of each mode (from a Service Provider or Regulator's perspective)
- ii. The Single Carrier section includes typical link budgets and fade margins and an update has been proposed (Contribution [IEEE C802.16a-02/47](#) ) which covers the range of channel models approved by TG3. This goes a long way to satisfying my comments (at least in respect of Coverage), and should be repeated for the OFDM and OFDMA Modes.

- iii. It is equally feasible to produce a similar analysis of Capacity (as per the FRD definition, using the approved Channel and Traffic models) for each of the Single Carrier, OFDM and OFDMA modes under “typical” frequency reuse and allocated bandwidth scenarios. Again, some of this data already exists in Draft D3 for the Single Carrier 2 mode.

## 5. Conclusion

It is my belief that the target audience for the 802.16 Standard is BWA Service Providers and (Spectrum) Regulators who will reference the Standard (and appropriate modes / options) in their licensing and procurement procedures. Their key reference in selecting modes or options within the Standard will be parameters which they can relate to their interests (e.g. coverage, capacity, relative spectrum efficiency and relative deployment cost ) rather than technology / topology attributes (such as Single Carrier, OFDM, OFDMA, PMP or Mesh).

In my opinion, most of the rejection explanations view the target audience as technology or system vendors who will then translate the technologies into system or deployment proposals to Service Providers and Regulators, using their own models and assumptions for coverage, capacity and relative deployment cost.

I maintain that it is perfectly achievable and reasonable to provide typical coverage (link budget and fade margin) and base station capacity data for each Standard, using the (updated) Single Carrier Mode tables and data as an example or starting point.

I am prepared to update / replace the two Comments to reflect the any new versions of the Draft Standard, but the principle behind my disapproval remains, so long as there are multiple / non-compatible modes (especially from a multi-vendor CPE perspective).

I emphasize that I am NOT objecting to having multiple Standards or Modes, if that is what the WG believes is appropriate or necessary. I am simply stating my belief that the reasoning and main characteristics / differentiators of each Standard or Mode should be spelled out for the benefit of Service Providers, Regulators and other target users of the IEEE Standard.