September 3, 2004

Dear NesCom Members,

I am writing as the Chair of 802.20 Working Group to request that NesCom and the IEEE-SA Board not approve the 802.16e Modified PAR for the reasons cited below. During the July IEEE 802 Plenary, the members of the IEEE 802.20 Working Group stated their strong opposition to the approval of the proposed 802.16e PAR modification. Though I attempted to state those views during a short debate at the 802 Executive Committee meeting on July 16, 2004, the Modified PAR was approved by a vote of 7-3-5. The Executive Committee then voted to remove the 802.16e PAR from continuous processing to allow discussion of the issue at NesCom and the IEEE-SA Board meeting.

Given the strong position the 802.20 Working Group members took at the July Plenary, I am obligated as the Working Group Chair to state the members' positions again.

Before and during the July IEEE 802 Plenary, the members of the IEEE 802.20 Working Group reviewed the proposed 802.16e PAR amendment. The members of the 802.20 Working Group passed a directed position motion in opposition to the modification of the original 802.16e PAR. The motion and rationale were provided to the Chair of 802.16 and the 802 Executive Committee members. Subsequently the 802.20 Working Group reviewed the reply comments and PAR changes supplied by the Chair of 802.16. The Working Group members of IEEE 802.20 found the response inadequate (see discussion below) and again stated their opposition by motion and asked the 802 Executive Committee not to approve the Modified PAR.

Attached are the 802.20 Motions and Rationale (Document #1). Attached are the original approved 802.16e PAR (Doc. #2) and the revised PAR modification, after comments, as sent by 802.16e to 802.20 (Doc. #3).

On behalf of the members of the IEEE 802.20 Working Group, I request the NesCom members and SA-Board not approve the proposed 802.16e PAR modification.

In explanation, the 802.16e Modified PAR should not be approved for the following reasons:

1. **Lack of Uniqueness of Modified Project – No Distinct Identity**
   The proposed PAR modification provides for modes of operation that are not compatible with the 802.16 base specifications. These new modes will compromise fixed subscriber capabilities that is counter to the Scope of the original PAR.

   This is stated in the ADDITIONAL NOTES section of the PAR "*Subscriber stations and base station specified herein shall be interoperable with existing physical layer specifications in IEEE Std. 802.16-2004 except when using one of their extensions with scaled down FFT sizes (1024, 512, 128). For OFDM (256 FFT)/OFDMA (2048) implementations as specified in IEEE Std. 802.16-2004, there shall be no changes or addition to the mandatory features and backward compatibility shall be maintained.*"

This is further documented in the minutes of the May 2004 of 802.16e (Doc. #4) with the below excerpt:
"Contribution 802.16e-04/98r4 containing the latest proposed PAR revisions was discussed. During the discussion, Itzik Kitrozer specifically requested that the following statement made by 98r4 presenter, Jose Puthenkulam, be recorded in the minutes (note: this is a paraphrasing of the statement, agreed to by both parties):"it's now possible to implement systems that may not be interoperable between 16d and 16e under the same PHY.""
(Please see Document #5)
In November 2002, the 802 Executive Committee chartered two groups to work on mobility projects:

- 802.16e for adding mobility to base 802.16 systems with the specific constraint of compatibility and interoperability
- 802.20 for a new PHY and MAC optimized for full mobility and no technology or compatibility constraints.

The proposed PAR modification clearly violated this original understanding and should not be approved as written.

A principle justification for the new non-inoperable modes is based upon the need to use narrow bandwidths down to 1.25 MHz. This was an agreed differentiation between 802.20 and 802.16e. The joint justification for both projects in November 2002, stated 802.16e would address bandwidth wider than 5MHz. Please see Document #6, as well as the Executive Committee minutes http://ieee802.org/minutes/nov2002/Minutes%20-%20Friday,%20November%2015,%202002.pdf.

The redefinition of the 802.16e PAR no longer gives the project a unique identity over 802.20, an existing project. Therefore it violates the "Five Criteria" for the project and the modification should not be approved.

2. **The inadequacy of 802.16's response to the comments provided by 802.16**
   a. <u>The response asserted:</u>

   Issues regarding distinct identity between the 802.16e and 802.20 PARs are not incorporated in any formal documents. However, some discussion items were represented in the presentation "MBWA and 802.16e: Two Markets –Two Projects" (802.16sgm-02/16 or 802m_ecsg-02/15). This document provides a two-page table of distinct elements. This list is far broader than the brief one below. Therefore, even if the PAR change could be construed as blurring the lines on all three points below, this would not necessarily blur the overall distinct identity. Therefore, even if the PAR change could be construed as blurring the lines on all three points below, this would not necessarily blur the overall distinct identity."

   The document referenced in the 802.16 reply was the document used by both 802.16 and 802.20 at the 802 Executive Committee to justify the approval of the two projects. Indeed the 802.20 comments did not address

every item in the referenced document since other differentiators also disappear as a result of the PAR modification.

Document #6 (802.16sgm-02/16) is attached and had the objectives of showing that 802.16e and 802.20 were unique with respect to each other as well as with respect to the efforts of 3G standardization. The document lists a total of 14 attributes (classified into end-user, service provider and technology dimensions) along which comparisons are made in order to differentiate 802.16e/802.20/3G. Six of these attributes are irrelevant in distinguishing between 802.16e (un-modified) and 802.20, but served to distinguish both projects from 3G. Please see Document #7 that eliminates the 3G comparisons for clarification.

The comments by 802.20 directly address the remaining four technical attributes. In the proposed Modified PAR version, the remaining 4 technical attributes become indistinguishable from those of 802.20 and as a result the end-user and service providers' differentiators also become untenable (Please Document #8 for rationale).

Clearly the response does not adequately address the proposed overlap. A revised Five Criteria with the Modified PAR proposal, if available, would have highlighted the issues more clearly.

b. 802.16 then states: *"Furthermore, we disagree that the proposed changes in these areas compromise the distinct identity, as explained below:"*

Item (a) of their response does not address the issue and merely includes a statement that 802.16e is *"continuing to provide a backward-compatible mobile upgrade path to all systems conforming to IEEE Standard 802.16-2004."* Regardless of the statement there will be modes, under the modified 802.16e PAR, that are neither compatible in technology nor in deployment scenarios. Such a situation does not qualify as a "backward-compatible upgrade path."

In *item (b)* 802.16 admits having dropped the lower 2 GHz limit; justifies it on the basis of accommodating the corresponding low-frequency limit in the revised, base standard; and denies the band overlap is a critical factor in determining distinct identity.

First, it should be noted that the change in scope of the revised 802.16 base specification was done without being identified in the relevant PAR and as such was done in contravention of the NesCom Conventions which requires that "All modified PARs and PARs for the revision of a standard shall include an indication of **all** changes that are part of the request" (emphasis added). Since the network operations addressed by bands below 2 GHz is different then that addressed by the higher frequencies, this is a scope change that directly impacts uniqueness in all three dimensions – technology, end-user and service provider.

In *item (c)* 802.16 again refuses to accept the channel bandwidth as an important attribute and argues that they can find "no proposed modification related to channel bandwidth" and that furthermore 802.16a already "called out channel bandwidth as low as 1.75 MHz". Though 1.75MHz and 1.25MHz may seem similar, the licensing of 1.25MHz channels to digital cellular operators illustrates this is an important difference and addresses different end-users and service provider needs. That the channel bandwidth issue is not addressed in the modified PAR (neither was the dropping of the 2 GHz limit in the revision to 802.16 base specification) does not eliminate the issue. Please see Document #9 that clearly states the rationale for the new modes includes the need to support narrowband channels including the 1.25 MHz channels.

The other 802.16 replies refer back to these basic answers that are rebutted above. The above clearly supports not approving the 802.16e PAR modification.
Finally, the distinction in scope question should be evaluated based upon current statements and a historical perspective.

3. Historical Perspective and Process Concerns

The project that eventually became 802.20 was launched as a result of a tutorial presented in March 2002. At the time the Chair of 802.16 approached the proponents of the project indicating that 802.16 would be interested in the project since they have been considering mobility as potential future work. 802.16 did not schedule a meeting during the Call for Interest meeting on the mobility project so that the 802.16 members could attend. As a result of that, the proponents agreed to launch a Study Group within 802.16 to define the mobility project and develop the PAR.

In subsequent meetings, during the discussions, it became clear that the SG participants who were voting members of 802.16 wanted a PAR that would mandate an amendment to 802.16a with compatible PHY and MAC. Whereas those participants that were non-voting members of 802.16 wanted a project that had no constraints and would be optimized for mobility. During the July 2002 meeting there was also a proposal to adopt a two PAR approach. One PAR to serve the needs of 802.16a and the other for a PAR designed for a mobility-optimized system.

The majority of that mobility Study Group defined and approved a PAR that had no constraints on compatibility with the fixed-wireless access system. Then the 802.16 members, as a whole, rejected the proposed PAR. The Study Group was shut down and the 802.16e PAR was created with constraints on interoperability with fixed modes. (Please see Document #10).

The above makes it clear that members of 802.16 themselves imposed constraints in the initial PAR. During the discussions, the advocates for no constraints stated 802.16a without incompatible changes would not be able to fully support mobility. Belated acceptance of these points does not justify creating a project

within a project and overlapping with 802.20 rather than bringing the proposed solutions to 802.20 that has a charter for such technologies. Considering the above history, the current attempt to change the backward compatibility requirement with a PAR modification versus working another group, 802 20 or creating a new project within 802, may be interpreted as members of 802.16 refusing to consider other technologies and possibly acting in concert to block potential technology choices.

4. A New Project and Potential Market Division Concerns

a. The revised PAR in Item 19 states that;

" Subscriber stations and base stations specified herein shall be interoperable with existing physical layer specifications in IEEE Std 802.16-2004 except when using one of their extensions with scaled down FFT sizes (1024, 512, 128). For OFDM (256 FFT)/OFDMA (2048 FFT) implementations as specified in IEEE Std 802.16-2004, there shall be no changes or additions to the mandatory features and backward compatibility shall be maintained."

This paragraph allows the definition of a scalable PHY that is not interoperable for FFT sizes 128, 512 and 1024. It does not allow this scalable PHY to address FFT sizes of 256 and 2048. This clearly indicates two separate projects, one tied to IEEE Std. 802.16-2004, the other not. Furthermore, this constraint cannot be justified on a technical basis as it makes would seem logical to allow the scalable PHY to cover all FFT sizes. This issue was raised in 802.20 comments to 802.16 and was not addressed in the reply. This constraint can only be explained by a tacit agreement to protect certain existing implementations and move to a new project. If the non-compatible modes were treated as new projects, IEEE 802 could decide where the work should be done whether in 802.20 or a new Working Group or a new Task Group in 802.16.

b. Clearly the modified PAR is an attempt at sponsoring a competing and redundant project to 802.20 within 802.16 and should, therefore, not be approved. In email discussions and at 802 Executive Committee meetings regarding the process for standards project sponsorship by the IEEE-SA CAG, the 802 Executive Committee including the Chair of 802.16 took the position that procedures be instituted that:
"*recognize that working groups must make selections between technical alternatives and prevent the CAG from becoming a mechanism that can be used for undermining the decision making process of working groups by sponsoring competing projects to standards and projects of those working groups;"*

c. The proposed PAR modification by 802.16e is an attempt to create a new and competing project without the formulation and approval of a new PAR. Given New Functionality is planned, the Modified PAR should have a revised Five Criteria per the 802 Policies and Procedures. A review of

the Five Criteria should be part of any approval process for a PAR modification with new work and new functionality as planned in 802.16e.

In summary, the proposed 802.16e Modified PAR should not be approved. The modification creates another project within 802.16e that does not have a Distinct Identity within IEEE 802. The proposed new work including the stated new modes to support full mobility can be brought to 802.20 where there are no restrictions on the scope of solutions that can be considered. The Modified PAR has new functionality and requires a new Five Criteria.

This is an important issue for the members of the 802.20 Working Group. Therefore, please contact me with any questions or clarifications.

Sincerely,
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Documents List:

1) 802.20 Positions on 802.16e (Directed Position votes in 802.20 and rationale)
2) 80216-02_48r4 Org802.16e PAR (Original approved 802.16e PAR)
3) 80216-04_33r3 802.16ePAR rev (modified PAR amendment as sent to 802.20 after comments)
4) 802.16e-04/11 (Minutes of Session 31, May 2004)
5) 802.16e-04/98r4 (J. Puthenkulam's Contribution marked as 98r3)
6) Uniqueness of Projects 1 (as originally developed with 802.16e Chair)
7) Uniqueness of Projects_WO_3G_ATTY (Original Uniqueness without 3G)
8) Post_Amendment_PARS_16_20 (now showing the lack of uniqueness with the proposed modification)
9) 802.16e-04/70r3 (FFT size & subchannelization for scalability)
10) 802.16-02/37 (Minutes of Session 20, July 2002)