

**IEEE 1900.7 Whitespace Radio Working Group  
12-14 December 2011, Scottsdale, AZ, USA**

**Chair: Stanislav Filin  
Acting Secretaries: Oliver Holland, Xin Zhang**

**First Session Minutes (AM2, Monday 12<sup>th</sup> December)**

**Call to Order**

The meeting was called to order by Stanislav at 10.40.

**Acting Secretary**

Oliver Holland appointed with unanimous agreement of the group, but he stated that he cannot attend some sessions due to 1900.1a technical editing in parallel. Another participant will be selected to stand in for him for the sessions that he cannot attend.

**Roll Call**

Oliver took the roll call.

Stanislav took attendance notes.

Quorum: 16 voting members, 10 present. Quorum established. The attendance was as follows:

Demessie	Yohannes	yes
Filin	Stanislav	yes
Harada	Hiroshi	
Hoang	Vinh-Dien	yes
Holland	Oliver	yes
Lee	Ignatius	
Lu	Liru	yes
Mackenzie	Richard	yes
Noguet	Dominique	yes
Prasad	Venkatesha	
Sun	Chen	yes
Swain	Darcy	
Tran	Ha Nguyen	yes
Xue	Jiantao	yes
Zhang	Xin	yes
Aljuaid	Muhammad	yes
Joan	Woolery	
Alex	Gelman	
Yuriy	Posherstnik	
Shinji	Murai	
Takayoshi	Hiroto	

### **Approval of Agenda**

Doc 7-11-0020-02, displayed on the screen.

Stanislav overviewed agenda, suggested cancellation of two sessions.

Dominique asked about choice of cancelled sessions and suggested that could be later sessions to make it easier for people from Europe to attend. Stanislav mentioned that the cancellations were chosen to avoid overlap with 1900.6. Dominique accepted this.

Motion to approve the agenda:

Oliver Holland moved.

Haguen Tran seconded.

There was no further discussion.

No objections or abstentions: approved by unanimous consent.

### **Call for essential patent claims**

Stanislav overviewed patent slides, duty to inform, etc.

There were no essential patent claims.

### **Approval of Minutes of Previous Meeting**

Motion to approve of telco on Nov 14 minutes:

Yohannes Alemseged moved.

Zhang Xin seconded.

There was no discussion.

No objections or abstentions: approved by unanimous consent.

Stanislav presented "Opening Report", doc number 7-11-0023-00.

There were no questions on the presentation.

### **Recess of the Meeting**

The session was recessed at 11.20, to resume at 13.20 local time.

## Second Session Minutes (PM1, Monday 12<sup>th</sup> December)

### Call to Order

Meeting was called to order by Stanislav.

### Roll Call

The roll call was taken. The attendance was as follows:

Demessie	Yohannes	yes
Filin	Stanislav	yes
Harada	Hiroshi	yes
Hoang	Vinh-Dien	yes
Holland	Oliver	
Lee	Ignatius	
Lu	Liru	yes
MacKenzie	Richard	yes
Noguet	Dominique	yes
Prasad	Vankatesha	yes
Sun	Chen	yes
Swain	Darcy	yes
Tran	HaNguyen	yes
Xue	Jiantao	yes
Zhang	Xin	yes
Aljuaid	Muhammad	
Joan	Woolery	yes
Alex	Gelman	yes
Yuriy	Posherstnik	yes
Shinji	Murai	yes
Takayoshi	Hiroto	yes

### Contributions

Dominique presented 1900.7-11-0024-01-CNTR.

Yohannes asked a question on how the concept fitted into different regulatory domains where you only have one control mechanism.

The answer was given: Indeed, the complexity grows exponentially if you want to use the 8MHz bandwidth. This is due to the fact that if you want to use 100% 8MHz channel, then you would need a filter with infinite number of taps, because in that way, the filter edge is vertical in frequency domain which is not possible. The Complexity of the filter depends not on the bandwidth but rather on the width of the transition band. This means that, if you want to have similar spectrum efficiency even for 6MHz channel, the filtering complexity is high. If you look at the graph that is being displayed, what we have to consider is not the absolute value of the channel width, but rather the used spectrum over channelization. The x-axis here is the ration of the bandwidth against

channelization. So if you want to use only 90% of the channel, the slope of the filter are still the same which means the complexity remains high. In this case, you can't compare used 6 MHz over 6MHz channelization and used 6 MHz over 8MHz channelization.

There was a disagreement expressed on the second bullet point in the summary slide. The ACLR requirement is ok, but it is not controversial with LTE?

The answer was given: What you ask is it if you don't operate in adjacent channel, you don't need filtering. Basically this is true, but if you look at the regulation statement, they also mention N+9 channels, these correspond to 72 MHz channel, which is the frequency of the radio. If you add all channels together, you will end up with large number of channel, in which you need to observe this requirement. If you don't want to dramatically reduce the number of channels you can operate, it is still important to observe ACLR which is mentioned in this presentation.

An opinion was expressed that this statement is to be compared with the availability of isolated channel versus the option of having made adjacent channel available for secondary user.

The answer was given: Point taken. The situation might be quite different across different locations.

There was the question: Are you aware of any other method that can suppress OFDM sidelobes?

The answer was given: Yes, that would be in the future presentation. This presentation was to highlight special channel issue in relation to this adjacent leakage problem.

There was another question on the complexity of the calculation. For a 100 MHz channel, a large number of tap is required. Is this design feasible?

The answer was given: Due to this additional constraint, we need to filtering which in turn incur additional complexity. Putting complexity issue aside, this design is feasible.

Stanislav contemplated which category this presentation should belong to. The presenter would say it is general requirement or radio regulation. Stanislav agreed.

Alina presented 1900.7-11-0025-01-CNTR

Dominique asked what the aim behind this channel model selection is.

The answer was given: To have a unified channel model for simulation.

Stanislav asked Dominique about his opinion.

Dominique answered: I don't have a strong opinion here, because we don't have clear use cases yet. We may have a diversity of scenarios which may result in many different channel models. Although, I agree to use the same channel model for the same scenarios.

Hiroshi expressed his opinion. This presentation is not to narrow down application, but if the application meet this range, we recommend to use it.

### **Recess of the Meeting**

Stanislav briefly introduced the content of PM2. The meeting was then recessed.

### Third Session Minutes (PM2, Monday 12<sup>th</sup> December)

#### Call to Order

The meeting was called to order by Stanislav.

#### Roll Call

The roll call was taken. The attendance was as follows:

Demessie	Yohannes	
Filin	Stanislav	yes
Harada	Hiroshi	yes
Hoang	Vinh-Dien	yes
Holland	Oliver	
Lee	Ignatius	
Lu	Liru	yes
MacKenzie	Richard	yes
Noguet	Dominique	
Prasad	Vankatesha	yes
Sun	Chen	
Swain	Darcy	
Tran	HaNguyen	
Xue	Jiantao	
Zhang	Xin	yes
Aljuaid	Muhammad	
Joan	Woolery	yes
Alex	Gelman	yes
Yuriy	Posherstnik	yes
Shinji	Murai	yes
Takayoshi	Hiroto	yes

#### Contributions

Stanislav presented 1900.7-11-0015-00, regarding liaisons for 1900.7

Richard asked a question about liaisons, “We will only know which liaison is needed at later stage”?

There was a suggestion that we need to decide whether we need liaisons or not.

There was a straw poll on liaisons:

Do we need to have liaisons?

Results:

Yes: Richard, Alina, Hoang, Xin

No: None

There was a request to add all the names of the IEEE groups to the motion. Joan and Hiroshi expressed their opinions on the procedure.

A question was asked: "Regarding the procedure once you have decided that you want to have liaison, I would like to recommend that you write down the group that you want to have liaison with, and why. For example, 1900.7 would like to have liaison with .11, for the reason, and the representative is xxx."

Stanislav asked if there was any other discussion on liaisons. None was heard.

Document 1-11-0065-01-DRFT-2nd was presented by Stanislav (2<sup>nd</sup> request to WGs for feedback on 1900.1 terms/definitions)

Attention was drawn to: "are there terms that you consider "common knowledge" in the field of DSA...."

Stanislav asked the working group if anyone would like to make any modification to the input, deleting some terms, or modifying some names. No comments were heard. Stanislav said that he will forward the WG opinion (no comments) to the 1900.1 WG Chair.

### **Recess of the Meeting**

The meeting was recessed until AM2 on Tuesday 13<sup>th</sup>.

## **Fourth Session Minutes (AM2, Tuesday 13<sup>th</sup> December)**

### **Call to Order**

The meeting was called to order by Stanislav.

### **Roll Call**

The roll call was taken. The attendance was as follows:

Demessie	Yohannes	yes
Filin	Stanislav	yes
Harada	Hiroshi	yes
Hoang	Vinh-Dien	yes
Holland	Oliver	
Lee	Ignatius	
Lu	Liru	yes
Mackenzie	Richard	yes
Noguet	Dominique	yes
Prasad	Vankatesha	
Sun	Chen	
Swain	Darcy	
Tran	HaNguyen	
Xue	Jiantao	

Zhang	Xin	yes
Aljuaid	Muhammad	yes
Joan	Woolery	yes
Alex	Gelman	yes
Yuriy	Posherstnik	yes
Shinji	Murai	
Takayoshi	Hiroto	

### **Revised Agenda**

Stanislav asked the group to approve document 20r3 as the meeting agenda. Agenda 20r3 was discussed and approved and uploaded to mentor.

Motion: To approve December 12-14 meeting agenda 7-11-0020-03

Moved: Richard

Seconded: Dominique

The motion was approved by unanimous consent.

Dominique asked a question about the possible change of schedule which would result in the collision with 1900.6. Stanislav answered that 1900.6 doesn't have PM2, we don't have PM1, so we don't have any collision with 1900.6. Tomorrow, PM2 is the DySPAN plenary; we would try to finish 1900.7 before PM2 tomorrow. So, the schedule is fine.

### **Draft Development Process**

The fourth session covered the draft development process.

Stanislav presented document 7-11-0019-00

Stanislav asked a question to the working group: Would it be beneficial for us to have a draft table of contents (ToC)?

Richard asked how early this is being done within other 1900 working groups?

Stanislav responded that there are different procedures. Some are going contributions such as 1900.4, some contributed session by session. In 802, some go by a full proposal. As he knows, in the 1900 group, inputs are mainly on a contribution by contribution basis.

Alina asked whether options shown in slide 7 relate to the two directions shown in an earlier slide.

Stanislav responded that what he was trying to achieve in slide 6 was to show that we need to have a draft ToC, which is easy for us to follow. Also we have two proposed directions. One is a full proposal, the other is step-by-step contributions. The full proposal is around June next year. To generate such document, you need ToC. This needs to be done soon. If we don't have a ToC, at least we should have a summary.

Alina asked whether, from your slide 6, if you go by direction 1, since at the moment, the use cases are not decided yet. If we adopt full proposal and the contribution are for different cases, how to decide which one to decide. She agrees that the draft ToC is important, but we need to narrow down the scope first. She would also like to know the thinking of the group.

Stanislav asked if there was any opinion from the group?

There was no response. Stanislav asked again if it would be beneficial to have a draft ToC.

Someone asked whether the working group knew what specific area that the standard would like to develop.

Stanislav responded that this is according to the scope. Scope is that this is a PHY and MAC layers.

Dominique stated that his feeling is that it is a bit early to discuss the ToC at this stage. We don't know how many options we have in whitespace. Maybe at later stage there may be some common technologies that people may want to push. At this stage, he feels it is a bit early to decide the way forward and also a ToC.

Dominique mentioned that the discussion is interesting, but too early.

Alina says that This discussion is necessary because there are many use cases; we need to narrow it down. We may need to have some strategy to keep it moving on.

Someone requested a summary of 1900.7 activities. Stanislav displayed document 10r0.

Alina asked if we are going to discuss use cases today? or tomorrow?

Stanislav responded: Let me look at the agenda, tomorrow in AM2 it is almost impossible to discuss use cases. The use case presentation would be scheduled today for PM2.

Alina stated that usually use cases are studied during the study group. I don't know how this would go in 1900.7. Presently, we have quite a large number of use cases which can cover from short distance to long distance. To narrow down is necessary, but how to narrow down? For a whitespace project, there is one limitation: we have to follow the law where the law has an impact on our use cases. We can't do every use case. We will need to have some strategy in mind, how can we select those use cases. Presently, we have a lot of use cases. But we don't have any specific requirements for them. If we can categorize them and give technical requirements, hopefully we can move the whole project forward.

Stanislav asked if we can postpone the discussion on the ToC.

None response was heard. Stanislav therefore summarized that the group feels at the moment ToC is too early to proceed. We should proceed with topics that were discussed in September meeting. For this meeting, we mainly discussed use cases.

### **Recess of the Meeting**

The meeting was recessed until PM2 on Tuesday 13<sup>th</sup>.

## Fifth Session Minutes (PM2, Tuesday 13<sup>th</sup> December)

### Call to Order

The meeting was called to order by Stanislav.

### Roll Call

The roll call was taken. The attendance was as follows:

Demessie	Yohannes	yes
Filin	Stanislav	yes
Harada	Hiroshi	yes
Hoang	Vinh-Dien	yes
Holland	Oliver	
Lee	Ignatius	
Lu	Liru	yes
MacKenzie	Richard	yes
Noguet	Dominique	yes
Prasad	Vankatesha	yes
Sun	Chen	yes
Swain	Darcy	
Tran	HaNguyen	yes
Xue	Jiantao	yes
Zhang	Xin	yes
Aljuaid	Muhammad	yes
Joan	Woolery	yes
Alex	Gelman	yes
Yuriy	Posherstnik	
Shinji	Murai	yes
Takayoshi	Hiroto	yes

### Contributions

BUPT presented "Underwater Usage Model" (document number 7-11-0028-00)

Dominique asked a question "There is radio communication in the underwater scenario, that is what I understood from your presentation. Is my understanding correct?"

The speaker answered "I can't hear a single word. The audio is very soft."

Alina commented that from her understanding, for underwater communication, whitespace communication may not be used; TV white space communication is only for over water part.

Stanislav commented that another question was already being asked from the floor, and that question should be answered first?

Discussion continued.

Alina commented that she wanted to clarify whether underwater communication would be using white space radio access. Or the proposal is only used TV white space for the over water part?

The answer was given that for the over water part is used TV WS, but for under water part, there are also some projects going on using electromagnetic waves for communication. From the relay station to the terminal, you actually expect to use electromagnetic wave device to implement communication. In that case, you should indicate this in the double line.

Stanislav summarized: for BS to BS, RS to terminal is using TV white space. From BS to RS, for example, the upper part is white space. From RS to terminal, the lower part is white space. Alina, does it clarify your answer?

Alina responded that it does.

Stanislav asked if there were any other questions. None were heard.

Yohannes presented "Use Cases" (document number 7-11-0029-00)

There was a question on what the rationale is behind this presentation.

Yohannes responded that it was partly a response to the call for proposals. The idea was that we try to capture all the ideas we have, but mainly it is a response to the call.

The questioner responded that maybe he should clarify his question a bit. Some of the scenarios have been presented in the previous presentation. He is wondering, in order to respond to the call, why do you prefer to have everything in a single presentation? He wonders, if there is any intention to have this document as a summary of the current status of your vision of where we are in terms of use cases.

Yohannes responded that the questioner was right: some of the use cases have been presented. Now we have 1900.7 officially formed, it is good to have a unified document to list all the available use cases that have received comments from the beginning. Even though some have been presented before, we think it is wise to add updated information as well.

The questioner's next question is related to the methodologies used in some use case considerations. It might be a good option to have a document where we can find all the scenarios. Would the group recommend to have one presentation in which all new scenarios will be included? Or do you suggest to have independent, separate presentations on use cases?

Alina stated that she would prefer to have one document to include all use case.

Stanislav asked if there were any other opinions on this.

Dominique commented that his opinion is that there is certain format that is used for the presentation. Some of the presenter might not be comfortable with the way presented here. If anyone would like to have a detailed presentation on certain use cases, they could have separate presentation. Additionally, it would be good to append a summary of their use cases to this presentation. This will help us we keep track of all use cases in a single document.

Alina asked if it can list out certain terminology related to each use case, which can help us to consider technical requirements. It might be good to categorize use cases according to range too. This will help us to come out with more detailed technical requirements.

Yohannes commented to Dominique: Please correct me if I understand your idea wrongly. What you are requested is to have a document that is similar to a system engineering document but dedicated to use cases. Inside this document, we will have all the new use cases that are approved by the working group, that will summarize use cases along with the parameters categorizing each group of use cases for the MAC and PHY design purposes, is that correct?

Dominique responded: Yes, it would be useful to have one document where you can find all the use cases. This is useful to create the draft, also for people who join the group later. At the same time, maybe people who want to have more space, or a different way of presenting their use cases, should also have freedom.

Stanislav asked that regarding the combined document, what would be the best procedure, any opinion from the group? He asked Yohannes what his vision is of such topic?

Yohannes responded that the presentation can be different, but finally, we need to have one single document containing all use cases. At some point, you may find two or three use cases share similar technical requirements. When he says "working group approved", is not document by document, but the summarized document. There should be a timeline for this. It takes time to get approval from the working group. This is what we need to consider when rushing to make a decision. These are Yohannes' personal opinions.

Stanislav reminded the group that in the September meeting we presented the first use cases document. The expected timeline is finalized. And the channel models are to be decided by the end of March meeting.

Dominique commented that he would like to mention that in his remark, he didn't mean the scenario document needed to be approved by the group. He understands that this is time-consuming. His intention is not to get the document approved, before appendments are added to the document.

Stanislav asked if there were any other questions or opinions?

Richard commented that for Yohannes' presentation, slide 5/6 is for the wireless backbone network. He is wondering: why is the tolerable delay high there?

Yohannes commented that this was a good question. We mainly focus was on the data service, so the whitespace link is between the BS and wireless radio terminal. When you consider the service you provide to the end user, for example interactive services, it really depends on the actual application.

Richard commented that the reason he asked the question is that he proposed a dynamic backhaul in the September meeting. One of the scenarios we consider is for small cells.

Yohannes mentioned that this was a good comment. It was asked if there were any other questions.

Stanislav thanked Yohannes for his presentation. He displayed the agenda. Today, we will finish PM2, tomorrow, we will have AM2 and PM1. The discussion is on the positioning of 1900.7. My current thinking is we can move some agenda items from PM1 to AM2. If we have extensive discussion in AM2, we can extend it to PM1. Is there any discussion?

**Recess of the Meeting**

No discussion was heard, so the meeting was recessed until AM2 on Wednesday 14<sup>th</sup>.

**Sixth Session Minutes (AM2, Wednesday 14<sup>th</sup> December)**

**Call to Order**

The meeting was called to order by Stanislav.

**Roll Call**

The roll call was taken. The attendance was as follows:

Demessie	Yohannes	yes
Filin	Stanislav	yes
Harada	Hiroshi	yes
Hoang	Vinh-Dien	yes
Holland	Oliver	
Lee	Ignatius	yes
Lu	Liru	yes
MacKenzie	Richard	yes
Noguet	Dominique	
Prasad	Vankatesha	yes
Sun	Chen	
Swain	Darcy	
Tran	HaNguyen	
Xue	Jiantao	
Zhang	Xin	yes
Aljuaid	Muhammad	yes
Joan	Woolery	yes
Alex	Gelman	yes
Yuriy	Posherstnik	
Shinji	Murai	
Takayoshi	Hiroto	

**Positioning of 1900.7**

This was discussed by Stanislav. This included the direction which we will move to in future, in terms of use cases, etc.

Richard commented that we need to be close to agreement on use cases first. Based on the use cases presented in the working group, such discussion is better to postpone to March.

### **Revised Agenda**

The agenda was discussed. Stanislav asked the group to approve document 20r4 as the meeting agenda. A motion was called to approve the December 12-14 meeting agenda 7-11-0020-04

Moved: Richard.

Seconded: Xin.

The motion was approved by unanimous consent.

### **Upcoming Meetings**

Upcoming meetings were discussed. The following schedule was arrived at:

- January 30, 2012, teleconference, 9AM - 11AM, UTC
- February 27, 2012, teleconference, 9AM - 11AM, UTC
- March 26-29, 2012, Osaka, Japan, face-to-face meeting co-located with DySPAN-SC plenary meeting

There was a motion on this schedule:

Moved: Richard.

Seconded: Xin.

The motion was approved by unanimous consent.

### **Any other business?**

There was no other business.

### **Meeting Adjournment**

Stanislav wrapped up discussions. There was a motion to adjourn the meeting:

Moved: Richard.

Seconded: Yohannes.

The motion was approved by unanimous consent.