**3GPP TSG RAN meeting #89e RP-20xxxx**

**Electronic Meeting, September 14 - 18, 2020**

## Status Report to TSG

**Agenda item:** 9.7.4

|  |  |
| --- | --- |
| **WI / SI Name** | Study on NR coverage enhancements |
| included in this status report | Study Item: Yes | Core part: No | Performance part:No | Testing part:No |
| **Acronym** | FS\_NR\_cov\_enh |
| **Unique ID** | 860036 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-200861 |
| **Target Completion Date****(indicate if changed)** | Study Item: 12/2020 | Core part: NA | Performance part: NA | Testing part: NA |
| **Overall Completion level** | Study Item: 50% | Core part: NA | Performance Part: NA | Testing part: NA |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG1 |
| **Rapporteur** | **Name** | Jianchi Zhu |
| **Company** | China Telecom |
| **Email** | zhujc@chinatelecom.cn |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

**RAN1 #102-e**

* The updated TR is endorsed in **R1-2005730.**

**Agreements:**

* TDL models are used to generate results in the link budget templates for FR1
	+ This does not preclude companies from performing the link-level simulations using CDL

**Agreements (for both FR1 & FR2):**

* For the definition of antenna array gain, adopt option 1, i.e. Antenna array gain is included in the link budget template, where there are four antenna gain components
	+ Note: the four components are illustrated below – the figure is for illustration purpose only
	+ FFS which component(s) are NOT part of the definition of antenna array gain

**Agreements:**

* For TDL Option 1
	+ Definition of MCL
		- Total transmit power - Receiver sensitivity + gNB antenna gain (component 2)
	+ Definition of MIL
		- Total transmit power - Receiver sensitivity + gNB antenna gain (component 2 + 3 + 4) + UE antenna gain
	+ Definition of MPL
		- Further discussion offline the definition using below as a starting point:
			* Total transmit power - Receiver sensitivity + gNB antenna array gain (component 2+3+4 for TDL option 1) + UE antenna gain - (8) Cable, connector, combiner, body losses (Tx side) - (20) Receiver implementation margin + (21a/b) H-ARQ gain - (25a/b) Shadow fading margin + (26) BS selection/macro-diversity gain - (27) Penetration margin + (28) Other gains – (12) Cable, connector, combiner, body losses (Rx side)
	+ Note: whether/how to use the above definitions is to be discussed

**Agreements:**

* Adopt single link budget template for both FR1 and FR2 based on IMT-2020 self-evaluation with rows for MIL, MCL, MPL, and necessary revisions, including adding/removing/revising/simplifying some parameters
	+ [For LLS based methodology, ] coverage bottleneck(s) identification is performed using at least [MCL and] MIL.
	+ [MCL values can also be considered to compare channels with similar antenna (and antenna array) gain]

**Agreements:**

* MPL can be used as supplemental information for coverage bottleneck(s) identification
* The results based on MPL are to be captured in TR
	+ Note: this is useful to show the achievable ISD.
* The definition of MPL shall be determined in RAN1
* RAN1 will not further discuss on specific values for the parameters related to MPL
	+ IMT-2020 values are as a starting point, but:
		- companies may use other values, and
		- for the parameters that companies think IMT-2020 self-evaluation does not clearly define the values for some scenarios, it is up to companies to report

**Agreements:**

* RAN1 strives for satisfying appropriate targets identified by companies particularly operators
	+ The targets may be in the form of one or more of the following:
		- 1. Scenario dependent targets, e.g., ISD/MPL
		- 2. Service dependent targets, e.g., [MCL=147] dB for VoIP;
		- 3. Relative difference between channels, e.g, MIL(/[MCL])
	+ Further values and details of such targets will be clarified at RAN1#103-e
	+ Note: there is no intention in RAN1 to update the study item objectives due to the identified targets.

**Agreements:**

* Adopt single link budget template for both FR1 and FR2 based on IMT-2020 self-evaluation with rows for MIL, MCL, MPL, and necessary revisions, including adding/removing/revising/simplifying some parameters
	+ For LLS based methodology, coverage bottleneck(s) identification is performed using at least MIL or MCL (assuming the set of simulation assumptions)
		- Even when SLS is used to obtain some components of MIL or MCL, it is categorized as LLS based methodology.
		- MCL values can also be used to identify the coverage bottleneck(s) when applicable
			* “applicable” above means the following situation:
				+ [comparing channels with similar antenna (and antenna array) gain, and/or
				+ the simulation results with MIL from companies are diverse, and the comparison with MIL is not easy]

**Agreements:**

* for SIP invite message
	+ Payload of 1500 bytes can be a starting point.
	+ The assumptions (TB size, time period etc.) are reported by companies.
	+ Contributions R1-2003464 and R1-2005259 are taken into account for the evaluation.
		- In addition, 1 second time period can also be considered.

**Agreements:**

For PDSCH, other parameters are reported by companies.

**Agreements:**

* Confirm the working assumption on DMRS configuration for PUSCH:
	+ For 3km/h: Type I, 1 or 2 DMRS symbol, no multiplexing with data.
* The number of DMRS symbols is reported by companies

**Agreements:**

* Update the description on Repetitions for PUSCH as follows:
	+ For VoIP, w/ type A repetition. (optional for type B repetition)
	The actual number of repetitions is reported by companies.

**Agreements:**

* Update the row for BLER for PUCCH as follows:
	+ BLER for CSI (1%, (optional for 10%) )

**Agreements:**

|  |  |
| --- | --- |
| Number of TxRUs for BS | gNB modelling in LLS for TDL:* 2 or 4 gNB receive chains in LLS.
* Optional: Number of gNB receive chains = number of TXRUs in LLS.
* Companies can report if and how correlation is modelled
 |

**Agreements:**

* Remove the whole bullets about gNB architectures to study for CDL and gNB modelling in LLS for CDL
* Note: if CDL is used for link level simulation for a certain purpose, the assumption for the number of TxRUs for BS is reported by companies, which implies that the assumption will be captured in the TR.

**Agreements:**

* The same PDSCH duration as PDSCH is used for Msg.4 PDSCH (i.e. remove the square bracket)
	+ Note: this does not preclude Msg4 with retransmission as a baseline.

**Agreements:**

* Update the BLER for PDCCH as follows:

|  |  |
| --- | --- |
| BLER for PDCCH | 1% BLER(optional for 10% BLER) |

**Agreements:**

* The agreement at RAN1#101-e remains: the simulation assumptions for SLS are up to companies’ reports
* The target performance of SLS based methodology, it is recommended to refer the agreements for LLS based methodology as much as possible.
* Note: these proposals are not necessary to be captured in the chairman’s note.

**Agreements:**

Update the agreements as follows:

* For VoIP performance evaluation based on link-level simulation for FR1

 A packet size of 320bits with 20ms data arriving interval is adopted:

|  |  |
| --- | --- |
|   | Size (bits) |
| Payload | 256 |
| CRC | 16 (TBS size lower than 3824 bits) |
| MAC | 16 (with 12 bits SN size) |
| RLC | 8 (with 6 bits SN size) |
| PDCP | 16 |
| RTP/UDP/IP | 24 (w RoHC) |
|  |  |

­      If applicable, companies report TB size assumed in evaluation

**Agreements:**

* For the evaluation, it is assumed that Msg. 4 PDSCH payload size is 1040 bits.

**Agreements:**

* For receiver interference density
	+ Up to each company to report for all scenarios as baseline
		- E.g. obtained by SLS, the ones for ITU self-evaluation, etc.

**Agreements:**

Further clarify the agreement on antenna gain and antenna gain components including antenna gain correction factors as follows:

* For both TDL option 1 (table A below) and TDL option 2 & CDL (table B below)
	+ The gain of antenna gain component 1 is included in LLS results
	+ The gain of antenna gain component 2 is included in link budget template
		- The gain is expressed by 10 \* log 10( N/k ) - Δ1
		- For TDL option 2 & CDL, the gain is 0 dB
	+ The gain of antenna gain component 3 is included in link budget template
	+ The gain of antenna gain component 4 is included in link budget template
		- The gain of antenna gain components 3 and 4 is expressed by Antenna Element Gain + 10 \* log 10( M/N ) -Δ2
		- For Tx, One row is used represent the gain of antenna gain component 3 + 4, i.e. row No. (4)
		- For Rx, One row is used represent the gain of antenna gain component 3 + 4, i.e. row No. (11)
		- Note: more appropriate name or explanation will be added to row No.(4) and (11). Details can be discussed when the link budget template is updated.

**Agreements:**

* Define PSD for DL Tx power, which is depend on deployment scenario
	+ For 4GHz frequency,
		- For rural with long distance scenario, PSD is 24 and 33 dBm/MHz
		- For rural scenario, PSD is 24 and 33 dBm/MHz
		- For urban scenario, PSD is 24 and 33 dBm/MHz
	+ For 2.6 GHz frequency,
		- For rural with long distance scenario, PSD is 33 dBm/MHz
		- For rural scenario, PSD is 33 dBm/MHz
		- For urban scenario, PSD is 33 dBm/MHz
	+ For 700MHz, 2GHz frequency
		- For rural with long distance scenario, PSD is 36 dBm/MHz
		- For rural scenario, PSD is 36 dBm/MHz
		- For urban scenario, PSD is 36 dBm/MHz
* Modify the description of row(s) of link budget template:
	+ Keep the meaning of Total transmit power (row (3) ) and adding a new row (3 bis):
		- (3bis) means the transmit power for occupied channel bandwidth for control channel (17a) or data channel (17b)
* Companies are requested to set appropriate values for parameters, which is used to determine total transmit power ( row (3) and/or (3bis) ), to satisfy the PSD value above
* Note: RAN1 will further check the consistency of the definition of row(s) in link budget table when the IMT-2020 based link budget tale is updated

**Agreements:**

For FR1 and FR2:

* Further clarify the Definition of MCL for downlink
	+ Total transmit power – Receiver sensitivity + gNB antenna gain (component 2), where
		- Total transmit power corresponds to row No.(3) + {(6) or -(7)} (for control & data channels)
		- Receiver sensitivity corresponds to row No.(22a/22b)
* Further clarify the Definition of MIL for downlink
	+ Total transmit power – Receiver sensitivity + gNB antenna gain (component 2 + 3 + 4) + UE antenna gain, where
		- Total transmit power + gNB antenna gain (component 2 + 3 + 4) corresponds to row No.(9a/9b), i.e.
			* (3) + (4) + (5) + (6) – (8) for control channel
			* (3) + (4) + (5) – (7) – (8) for data channel
			* Note: the derivation of (9a/9b) will be modified depending on the discussion on antenna gain & antenna gain correction
		- Receiver sensitivity corresponds to row No.(22a/22b)
		- (Working assumption for FR2) UE antenna gain corresponds to row No.(11)+No(11bis)
* Note: further refinement/definition of (3) and/or (22a/22b) can be discussed when link budget table is updated.

**Agreements:**

Definition of MPL for TDL option 1

* MPL = MIL + [(21a/b) H-ARQ gain] – [ (25a/b) Shadow fading margin – (27) Penetration margin ] + [(26) BS selection/macro-diversity gain ] + [(28) Other gains] – [(12) Cable, connector, combiner, body losses (Rx side) ]
* Note1: (8) is not necessary because it is included in the definition of MIL
* Note2: (20) is not necessary because it is included in receiver sensitivity, which is used to derive MIL

**Agreements:**

·         As for the agreement on antenna gain and antenna gain components including antenna gain correction factors, Table A and Table B are defined as below

Table A. antenna gain components for TDL option 1



Table B. antenna gain components for TDL option 2 and CDL

**Agreements:**

* Latency requirements assumed in VoIP evaluation for TDD and FDD are reported by companies

**Agreements:**

* For link level simulations in FR2, only PUCCH format 1 and format 3 are considered for baseline performance evaluation.
* For link level simulations in FR2, only PUCCH duration of 14 OFDM symbols is considered for baseline performance evaluation.
* For link level simulations in FR2, consider 4 DMRS symbol for PUCCH Format 3.
* Consider only one panel at the UE in link budget in FR2.
* For link budget calculation in FR2, downlink transmit power is scaled by the occupied bandwidth. The following downlink transmit power vs occupied bandwidth values are considered as baseline for the calculations:
	+ 40 dBm for 100 MHz Urban scenario,
	+ 23 dBm for 100 MHz Indoor scenario.
* For link budget calculation in FR2, an uplink transmit power of 23dBm is considered for baseline performance evaluations. Other values can be reported by companies.
* Confirm the target throughput values of the REL-17 SID for the suburban scenario:
	+ DL: 1 Mbps, UL: 50 kbps
* Study performance of PUSCH in FR2 only for DFT-s-OFDM.
* For link level simulations, only 1% BLER should be considered for baseline performance evaluation of PDDCH in FR2.
* For link level simulations in FR2, only PUSCH repetition type A is considered for baseline performance evaluation.
	+ Note: companies are not precluded to report results for repetition type B.
* Suburban scenario is deprioritized for NR coverage enhancement SI.
* Baseline performance evaluation of msg1 transmission is studied for 1% missed detection probability in FR2.
* Only 1% BLER target should be considered for baseline performance evaluation of PUCCH in FR2, regardless of whether UCI includes CSI feedback or not.
* Simulation assumptions for SLS in FR2 are up to companies’ reports, i.e., no more clarification is needed, as per agreement during RAN1#101-e.

**Agreements:**

* Capture the following updated structure in TR 38.830.

6.1 PUSCH coverage enhancements

6.1.1 Time-domain based solutions

6.1.2 Frequency-domain based solutions

6.1.3 DM-RS enhancements

6.1.4 Power-domain based solutions

6.1.5 Spatial-domain based solutions

6.1.6 Others

**Agreements:**

* Prioritize the study on the performance and specification impacts on time domain based solutions for PUSCH enhancements, including
	+ Increase the number of repetitions for PUSCH repetition  type A
		- PUSCH repetition with non-consecutive slots/on the basis of available slots for TDD
		- Note: whether increasing the number of PUSCH repetition for FDD depends on the outcome of AI 8.8.1.1.
	+ Enhancement on PUSCH repetition Type B
		- E.g., actual repetition across the slot boundary, or the length of actual repetition larger than 14 symbols, etc.
	+ TB processing at least over multi-slot PUSCH
		- e.g., single TB, sized for a single slot, but transmitted in parts over multiple slots; or single TB, sized for multiple slots, transmitted over multiple slots, and in conjunction with repetition, etc.
* FFS
	+ OCC spreading based repetition
	+ Symbol-level repetition
	+ TB interleaving
	+ RV repetition
	+ Early termination of PUSCH repetitions

**Agreements:**

* Following solutions are not considered for PUSCH enhancements in this study item in RAN1:
	+ Enhancements to improve spherical coverage / beam correspondence
	+ Reflective arrays
	+ Polarization aspects of the UL and/or DL reference signals

**Agreements:**

* Prioritize the study on the performance and specification impacts on DM-RS enhancements for PUSCH, including
	+ Cross-slot channel estimation
	+ With a lower priority compared with cross-slot channel estimation (i.e., companies are encouraged to study it)
		- Lower density
			* E.g., DM-RS sharing among multiple PUSCH transmissions **or lower DMRS density in the frequency domain.**
		- Higher density
			* E.g., in time or frequency domain, e.g., 1-comb pattern
		- Adaptive configuration
		- DM-RS balancing among frequency hops

**Agreements:**

* Multiple layer PUSCH transmission with DFT-S-OFDM for PUSCH enhancements can be studied with low priority.
* Study open-loop/closed loop Tx diversity for PUSCH enhancements with low priority.

**Agreements:**

* Study the performance and specification impacts on frequency domain based solutions for PUSCH, including
	+ Inter-slot frequency hopping
		- with more frequency offsets
		- with more frequency hopping positions.
	+ Inter-slot frequency hopping with inter-slot bundling to enable cross-slot channel estimation
	+ Enhancements on frequency hopping for PUSCH repetition type B
		- Note that the above inter-slot frequency hopping enhancement can apply for PUSCH repetition type B
	+ Sub-PRB transmission for VoIP
		- FFS: details, e.g., number of tones, multi-slot aggregation
* FFS
	+ Intra-slot frequency hopping
		- with more frequency offsets
		- with more frequency hopping positions.

[Note: Appropriate simulation assumptions are expected.]

**Agreements:**

* Study following power domain based solution for PUSCH enhancements
	+ Waveform design to optimize MPR/A-MPR
	+ [FDD high power UE]
	+ Power boosting for pi/2 BPSK

Note: if a LS to RAN4 (for the last two bullets) is deemed necessary, target sending the LS in the 1st week of RAN1#103-e

**Agreements:**

Contingent on all of the outcome of sub-agenda 8.8.1 regarding PUCCH enhancements, prioritize the study of the following schemes for PUCCH coverage enhancement,

* DMRS-less PUCCH
	+ FFS: design detail for DMRS-less PUCCH, e.g., sequence based PUCCH transmission, v.s. reuse Rel-15 scheme to transmit UCI without DMRS
* Rel-16 PUSCH-repetition-Type-B like PUCCH repetition at least for UCI <=11 bits.
* (Explicit or implicit) Dynamic PUCCH repetition factor indication
* DMRS bundling cross PUCCH repetitions
	+ Including study of transmitting a subset of PUCCH repetitions without DMRS, at least for UCI<=11 bits

Note 1: other schemes are not excluded.

Note 2: the study on DMRS bundling for PUCCH repetition can be a joint study with DMRS bundling for PUSCH repetition studied under 8.8.2.1.

Note 3: Companies are invited to report details of the receivers used in the evaluation. Advanced receiver can be included (not mandatory) in performance evaluations. Performance and receiver complexity are discussed respect to a baseline Rel-15/16 PUCCH scheme.

Note 4: proposed PUCCH repetitions scheme shall account for the resources used by PUSCH to meet the throughput target and should be compared against Rel-15/16 PUCCH repetition framework.

[Note 5: enhancement on one or more PUCCH formats/UCI types may or may not be needed, depends on the outcome of sub-agenda 8.8.1]

**Agreements:**

 Deprioritize the study of the following schemes for PUCCH coverage enhancement

* UE Antenna configuration enhancement for FR2
* Relay (including sidelink relay)
* Reflective arrays

**Agreements:**

Contingent on all of the outcome of sub-agenda 8.8.1 regarding PUCCH enhancements, the following schemes for PUCCH coverage enhancement can be further studied

* Sequence based PF 0/1 with Pi/2 BPSK
* Pre-DFT data-RS multiplexing for PF2 with Pi/2 BPSK
* UCI size reduction
* Freq hopping enhancement for PUCCH
* Short/mini-slot PUCCH repetition
* Power control enhancement for PUCCH (including power boost for pi/2 BPSK)
* Increase maximum # allowed repetitions for PUCCH
* PUCCH Transmit diversity scheme
* Symbol-level repetition for long PUCCH
* Split UCI payload on short and long PUCCH on adjacent S and U slots
* Potential higher DMRS density for PUCCH with repetitions

**Conclusion:**

For the performance evaluation of PUCCH coverage enhancement schemes under 8.8.2.2, use PUCCH simulation assumptions agreed under 8.4.1 in RAN1#101e as a baseline. Companies are encouraged to report additional simulation parameters/assumptions particular to their proposed schemes together with the simulations results in RAN1 #103e.

**Agreements:**

* Study Msg3 PUSCH enhancement in NR coverage enhancement SI
	+ Study at least Msg3 PUSCH repetition
		- FFS the aspects to be enhanced, e.g., signaling indication, repetition pattern, interplay between Msg1 and Msg3, DM-RS enhancements related to repetition etc.
	+ FFS multiple-antenna techniques.

**Agreements:**

* Study whether or how to enhance MsgA PUSCH in NR coverage enhancement SI

**Agreements:**

If PRACH enhancement is needed, study it in NR coverage enhancement SI, e.g. multiple PRACH transmissions.

**Agreements:**

Study whether/how to enable potential techniques for early CSI and/or beam refinement for physical channels during initial/random access procedure.

**Agreements:**

* If PDCCH enhancement is needed based on evaluation, study PDCCH enhancement for NR coverage enhancement
	+ Study at least for broadcast PDCCH
		- For broadcast PDCCH, it includes a PDCCH monitored in a Type0/0A/1/2-PDCCH CSS set.
	+ FFS unicast PDCCH
	+ Study the aspects to be enhanced, e.g., PDCCH repetition.

**Agreements:**

Further discuss the evaluation of PDSCH and discuss whether/how to enhance PDSCH in NR coverage enhancement SI.

**Agreements:**

Enhancement to PUSCH scheduled by RAR UL grant will not consider the optimization specific for CFRA case in NR coverage SI.

**Agreements:**

* Capture the following structure in TR 38.830.

6.3 Coverage enhancements for channels other than PUSCH and PUCCH

6.3.1 Enhancements for Msg3 PUSCH

* Note: The above structure can be further updated by adding more sections under section 6.3 for other enhancements if justified.

#### 2.1.2 Remaining Open issues

* Remaining issues on UE antenna gain modelling, MPL definition and link budget template.
* Identify baseline coverage performance for both DL and UL based on link-level simulation.
	+ UL channels (including PUSCH and PUCCH) are prioritized for FR1.
	+ Both DL and UL channels for FR2.
* Identify the performance target for coverage enhancement, and study the performance and specification impacts for the potential solutions for coverage enhancements based on agreements at RAN1 #102-e.
	+ The target channels include at least PUSCH/PUCCH.

## 2.2 RAN2

#### 2.2.1 Agreements

#### 2.2.2 Remaining Open issues

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

#### 2.4.2 Remaining Open issues

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

RAN1 #102-e:

1. [R1-2005729](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005729.zip) Updated work plan for Study on NR coverage enhancements China Telecom
2. [R1-2005730](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005730.zip) TR 38.830 v0.0.2 Study on NR coverage enhancements China Telecom
3. R1-2007449 [102-e-NR-CovEnh-01] Summary on A.I. 8.8.1.1 baseline coverage performance using LLS for FR1 Moderator (SoftBank).
4. R1-2007414 [102-e-NR-CovEnh-02] FL Summary of Baseline Coverage Evaluation of DL and UL for FR2 Moderator (Nokia/NSB)
5. R1-2007404 [102-e-NR-CovEnh-03] Email discussion/approval on PUSCH coverage enhancement Moderator (China Telecom)
6. R1-2007473 [102-e-NR-CovEnh-04] FL summary of PUCCH coverage enhancement Moderator (Qualcomm Incorporated)
7. R1-2007392 [102-e-NR-CovEnh-05] Feature lead summary on coverage enhancement for channels other than PUSCH and PUCCH Moderator (ZTE Corporation)
8. [R1-2006242](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006242.zip) Discussion on simulation assumptions for VoIP InterDigital, Inc.
9. [R1-2005256](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005256.zip) Evaluation on the baseline performance for FR1 Huawei, HiSilicon
10. [R1-2005297](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005297.zip) Baseline coverage evaluation of UL and DL channels – FR1 Nokia, Nokia Shanghai Bell
11. [R1-2005393](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005393.zip) Evaluation on NR coverage performance for FR1 vivo
12. [R1-2005425](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005425.zip) Discussion on baseline coverage performance for FR1 ZTE
13. [R1-2005722](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005722.zip) Baseline coverage performance for FR1 CATT
14. [R1-2005731](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005731.zip) Baseline performance for NR coverage enhancements for FR1 China Telecom
15. [R1-2005887](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005887.zip) Discussion on baseline coverage performance for FR1 Intel Corporation
16. [R1-2005939](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005939.zip) FR1 PUSCH Coverage Performance Sierra Wireless, S.A.
17. [R1-2006045](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006045.zip) Evaluation on NR coverage performance for FR1 OPPO
18. [R1-2006160](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006160.zip) Baseline coverage performance using LLS for FR1 Samsung
19. [R1-2006224](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006224.zip) Discussion on the baseline performance in FR1 CMCC
20. [R1-2006243](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006243.zip) FR1 baseline coverage performance using LLS InterDigital, Inc.
21. [R1-2006346](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006346.zip) Baseline coverage performance analysis in FR1 Panasonic Corporation
22. [R1-2006455](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006455.zip) Baseline coverage performance for uplink Indian Institute of Tech (H)
23. [R1-2006530](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006530.zip) Evaluation on FR1 coverage performance Apple
24. [R1-2006534](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006534.zip) Baseline coverage performance for FR1 Xiaomi Technology
25. [R1-2006578](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006578.zip) Evaluation results of coverage for FR1 Urban scenario Sharp
26. [R1-2006611](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006611.zip) Link and System Evaluation of Coverage for FR1 Ericsson
27. [R1-2006645](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006645.zip) Views on target performance metric and values for FR1 coverage enhancements SoftBank Corp.
28. [R1-2006652](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006652.zip) Baseline coverage performance for FR1 Charter Communications
29. [R1-2006739](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006739.zip) Baseline coverage performance for FR1 NTT DOCOMO, INC.
30. [R1-2006818](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006818.zip) Baseline FR1 coverage performance Qualcomm Incorporated
31. [R1-2005257](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005257.zip) Evaluation on the baseline performance for FR2 Huawei, HiSilicon
32. [R1-2005298](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005298.zip) Baseline coverage evaluation of UL and DL channels – FR2 Nokia, Nokia Shanghai Bell
33. [R1-2005394](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005394.zip) Evaluation on NR coverage performance for FR2 vivo
34. [R1-2005426](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005426.zip) Discussion on baseline coverage performance for FR2 ZTE
35. [R1-2005723](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005723.zip) Baseline coverage performance for FR2 CATT
36. [R1-2005888](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005888.zip) Discussion on baseline coverage performance for FR2 Intel Corporation
37. [R1-2006046](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006046.zip) Evaluation on NR coverage performance for FR2 OPPO
38. [R1-2006161](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006161.zip) Baseline coverage performance using LLS for FR2 Samsung
39. [R1-2006225](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006225.zip) Discussion on the baseline performance in FR2 CMCC
40. [R1-2006244](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006244.zip) FR2 baseline coverage performance using LLS InterDigital, Inc.
41. [R1-2006612](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006612.zip) Link and System Evaluation of Coverage for FR2 Ericsson
42. [R1-2006740](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006740.zip) Baseline coverage performance for FR2 NTT DOCOMO, INC.
43. [R1-2006819](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006819.zip) Baseline FR2 coverage performance Qualcomm Incorporated
44. [R1-2005258](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005258.zip) Discussion on the potential coverage enhancement solutions for PUSCH Huawei, HiSilicon
45. [R1-2005299](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005299.zip) Discussion on potential approaches and solutions for NR PUSCH coverage enhancement Nokia, Nokia Shanghai Bell
46. [R1-2005395](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005395.zip) Discussion on Solutions for PUSCH coverage enhancement vivo
47. [R1-2005427](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005427.zip) Discussion on potential techniques for PUSCH coverage enhancements ZTE
48. [R1-2005584](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005584.zip) On PUSCH coverage enhancement techniques Sony
49. [R1-2005724](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005724.zip) Discussion on potential techniques for PUSCH coverage enhancement CATT
50. [R1-2005732](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005732.zip) Potential solutions for PUSCH coverage enhancements China Telecom
51. [R1-2005758](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005758.zip) Discussion on PUSCH coverage enhancement NEC
52. [R1-2005889](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005889.zip) Discussion on potential techniques for PUSCH coverage enhancement Intel Corporation
53. [R1-2005938](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005938.zip) Potential techniques for PUSCH coverage enhancements Sierra Wireless, S.A.
54. [R1-2006047](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006047.zip) Consideration on PUSCH coverage enhancement OPPO
55. [R1-2006162](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006162.zip) PUSCH coverage enhancement Samsung
56. [R1-2006226](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006226.zip) Discussion on the PUSCH coverage enhancement CMCC
57. [R1-2006245](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006245.zip) PUSCH coverage enhancement InterDigital, Inc.
58. [R1-2006253](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006253.zip) Potential solutions for PUSCH coverage enhancement Spreadtrum Communications
59. [R1-2006348](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006348.zip) Discussion on PUSCH coverage enhancements Panasonic Corporation
60. [R1-2006456](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006456.zip) PUSCH coverage enhancements Indian Institute of Tech (H)
61. [R1-2006531](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006531.zip) On potential techniques for PUSCH coverage enhancement Apple
62. [R1-2006579](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006579.zip) PUSCH coverage enhancement Sharp
63. [R1-2006613](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006613.zip) PUSCH coverage enhancement Ericsson
64. [R1-2006741](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006741.zip) Potential techniques for PUSCH coverage enhancements NTT DOCOMO, INC.
65. [R1-2006820](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006820.zip) Potential coverage enhancement techniques for PUSCH Qualcomm Incorporated
66. [R1-2006877](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006877.zip) Discussion on potential techniques for coverage enhancement LG Electronics
67. [R1-2006892](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006892.zip) Discussion on potential techniques for PUSCH coverage enhancement WILUS Inc.
68. [R1-2005273](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005273.zip) Discussion on the potential coverage enhancement solutions for PUCCH Huawei, HiSilicon
69. [R1-2005300](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005300.zip) Discussion on potential approaches and solutions for NR PUCCH coverage enhancement Nokia, Nokia Shanghai Bell
70. [R1-2005396](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005396.zip) Discussion on Solutions for PUCCH coverage enhancement vivo
71. [R1-2005428](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005428.zip) Discussion on potential techniques for PUCCH coverage enhancements ZTE
72. [R1-2005585](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005585.zip) On PUCCH coverage enhancement techniques Sony
73. [R1-2005725](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005725.zip) Discussion on potential techniques for PUCCH coverage enhancement CATT
74. [R1-2005759](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005759.zip) Discussion on PUCCH coverage enhancement NEC
75. [R1-2005890](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005890.zip) Discussion on potential techniques for PUCCH coverage enhancement Intel Corporation
76. [R1-2006048](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006048.zip) Consideration on PUCCH coverage enhancement OPPO
77. [R1-2006163](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006163.zip) PUCCH coverage enhancement Samsung
78. [R1-2006227](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006227.zip) Discussion on the PUCCH coverage enhancement CMCC
79. [R1-2006246](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006246.zip) PUCCH coverage enhancement InterDigital, Inc.
80. [R1-2006349](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006349.zip) Discussion on PUCCH coverage enhancements Panasonic Corporation
81. [R1-2006457](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006457.zip) PUCCH coverage enhancements Indian Institute of Tech (H)
82. [R1-2006580](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006580.zip) PUCCH coverage enhancement Sharp
83. [R1-2006614](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006614.zip) PUCCH coverage enhancement Ericsson
84. [R1-2006742](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006742.zip) Potential techniques for PUCCH coverage enhancements NTT DOCOMO, INC.
85. [R1-2006821](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006821.zip) Potential coverage enhancement techniques for PUCCH Qualcomm Incorporated
86. [R1-2006880](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006880.zip) Limitations of NR short block-length codes for PUCCH coverage enhancement EURECOM
87. [R1-2006893](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006893.zip) Discussion on potential techniques for PUCCH coverage enhancement WILUS Inc.
88. [R1-2005274](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005274.zip) Discussion on the potential coverage enhancement solutions for other channels Huawei, HiSilicon
89. [R1-2005301](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005301.zip) Discussion on potential approaches and solutions for NR coverage enhancement: other channels than PUSCH and PUCCH Nokia, Nokia Shanghai Bell
90. [R1-2005397](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005397.zip) Discussion on coverage enhancement for channels other than PUCCH and PUSCH vivo
91. [R1-2005429](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005429.zip) Discussion on potential techniques for channels other than PUSCH and PUCCH ZTE
92. [R1-2005586](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005586.zip) Coverage enhancement for channels other than PUSCH and PUCCH Sony
93. [R1-2005726](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005726.zip) Disucssion on coverage enhancement for channels other than PUSCH and PUCCH CATT
94. [R1-2005891](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005891.zip) Discussion on NR coverage enhancement for other physical channels Intel Corporation
95. [R1-2006049](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006049.zip) Enhancement on NR channels for coverage OPPO
96. [R1-2006164](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006164.zip) Coverage enhancement for channels other than PUSCH and PUCCH Samsung
97. [R1-2006292](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006292.zip) Coverage enhancement for initial access InterDigital, Inc.
98. [R1-2006532](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006532.zip) On potential techniques for PDCCH and PDSCH coverage enhancement Apple
99. [R1-2006615](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006615.zip) Coverage enhancement for channels other than PUSCH and PUCCH Ericsson
100. [R1-2006743](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006743.zip) Potential techniques for coverage enhancement for channels other than PUSCH and PUCCH NTT DOCOMO, INC.
101. [R1-2006822](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006822.zip) Potential coverage enhancement techniques for other channels Qualcomm Incorporated
102. [R1-2005259](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005259.zip) Discussions on simulation assumptions for VoIP Huawei, HiSilicon
103. [R1-2005303](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005303.zip) Evaluation assumptions for NR coverage enhancement evaluation Nokia, Nokia Shanghai Bell
104. [R1-2005398](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005398.zip) Considerations on Evaluation Assumptions for Coverage Enhancements vivo
105. [R1-2005430](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005430.zip) Discussion on evaluation methodology for NR coverage ZTE
106. [R1-2005727](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005727.zip) Discussion on the methodology for baseline coverage performance using LLS CATT
107. [R1-2005733](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005733.zip) Remaining issues on evaluation methodology for NR coverage enhancements China Telecom
108. [R1-2005892](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2005892.zip) Discussion on simulation assumptions for NR coverage enhancement Intel Corporation
109. [R1-2006050](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006050.zip) Functionality of Coverage Enhancement and other SI/WI OPPO
110. [R1-2006293](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006293.zip) Reducing PDCCH load of coverage-limited UEs InterDigital, Inc.
111. [R1-2006616](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006616.zip) Evaluation methodology for coverage enhancements Ericsson
112. [R1-2006823](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006823.zip) Other coverage enhancement aspects Qualcomm Incorporated
113. [R1-2006977](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006977.zip) Potential coverage enhancement techniques for PUSCH Qualcomm Incorporated
114. [R1-2006990](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2006990.zip) Baseline coverage performance analysis in FR1 Panasonic Corporation
115. [R1-2007010](file:///C%3A%5CUsers%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_102%5CDocs%5CR1-2007010.zip) Baseline coverage performance for FR1 CATT

 31.08.2020 minor adaptations for RAN #89e

 20.04.2020 minor adaptations for RAN #88e

 18.02.2020 minor adaptations for RAN #87e

 14.11.2019 minor adaptations for RAN #86

 18.08.2019 minor adaptations for RAN #85

 12.05.2019 minor adaptations for RAN #84

 27.02.2019 minor adaptations for RAN #83

 21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template