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| 3GPP RAN5 PRD 21 v1.4.1 (2023-3) | |
| Permanent Reference Document | |
| 3rd Generation Partnership Project;  Technical Specification Group RAN WG5;  Permanent Reference Document (PRD);  NR bands and 5G NR CADC configuration handling in RAN5  (Release 15 and later releases) | |
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# Foreword

This Permanent Reference Document (PRD) has been produced by the 3rd Generation Partnership Project (3GPP) TSG RAN Working Group 5 (RAN WG5 = RAN5).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

# Introduction

PRD21 describes handling and tracks completion status of RAN5 work items introducing new NR bands, new channel bandwidth extensions of existing NR bands and 5G NR CADC configurations. This also covers handling and tracking of RAN5 work items for introducing new power classes for NR bands and 5G NR CADC configurations.

PRD21 is based on the RAN5 agreements in [1-10]. In case of any deviations between PRD21 and the agreements in [1-10], PRD21 takes precedence.

Clause 4 provides RAN5 agreed guidelines for the different areas covered by PRD21:

- 5G NR CADC configurations (sub-clause 4.1)

- New NR bands and CBW extensions (sub-clause 4.2)

- 5G NR feature specific WIs impacting 5G NR CADC configurations (sub-clause 4.3)

- 5G NR High Power WIs impacting 5G NR CADC configurations (sub-clause 4.4)

- 5G NR CADC fallback configurations without Interested Operator or Interested Deployer (sub-clause 4.5)

The tracking of completion status, industry priorities and responsibility of NR bands and 5G NR CADC configurations is provided by the PRD21 attached Excel document "5G NR bands and CADC configurations list". Clause 5 gives an overview of the different work sheets in the Excel document.

For NR bands and 5G NR CADC configuration work items the handling in RAN5 is based on the following principles endorsed by RAN5 at RAN5#94-e in [10]:

- RAN5 5G NR CADC configuration work items should focus on updating existing test cases and/or adding new test cases for the new type of 5G NR CADC configurations introduced by the work items. There shall be a column named "Status" in the PRD21 5G NR CADC list showing the status of the configuration is "Pending","Ongoing" or "Completed". See clause 3.1 for definition of "Pending","Ongoing" or "Completed".

- The minimum criteria for closing a RAN5 5G NR CADC configuration work item is that the associated RAN4 core work item(s) are completed; that all required new or existing test cases have been completed for at least one representative 5G NR CADC configuration; and that PRD21 includes all the 5G NR CADC configurations introduced by the associated RAN4 core work items. It is encouraged to close a RAN5 5G NR CADC configuration work item when there are no “Ongoing” configurations in the 5G NR CADC configurations list.

- PRD21 is used to keep track of TS 38.101-1 [11], TS 38.101-2 [12] and TS 38.101-3 [13] 5G NR CADC configurations and the status of the configurations in RAN5 conformance test specifications.

- A “Completion Declaration Statement (CDS) + the WP attached” is used to formally declare RAN5 completed NR bands and 5G NR CADC configurations. The RAN5 Tdoc number of the CDS would be recorded in the PRD21 list.

# 1 Scope

The scope of present document is to track status of for NR bands, NR band CBW extensions and 5G NR CADC configurations and its power classes covered by RAN5 work items and to provide a tool and guideline for companies volunteering to take responsibility to introduce new NR bands, NR band CBW extensions and 5G NR CADC configurations in 3GPP RAN5 test specifications.

The RAN5 work items covered by RAN5 PRD21 are:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** | **Status** |
| Rel-15 | 760087 | UE Conformance Test Aspects - 5G system with NR and LTE  Sub-WI: Rel-15 NR bands, NR CA/DC and EN-DC configurations | TEI15\_test, 5GS\_NR\_LTE-UEConTest | Completed |
| Rel-16 | 870062 | UE Conformance Test Aspects - High power UE (power class 2) for EN-DC (1 LTE TDD band + 1 NR TDD band) | TEI16\_test, ENDC\_UE\_PC2\_TDD\_TDD-UEConTest | Completed |
| 830083 | UE Conformance Test Aspects - Rel-16 NR CA and DC; and NR and LTE DC Configurations | NR\_CADC\_NR\_LTE\_DC\_R16-UEConTest | Ongoing |
| 850062 | UE Conformance Test Aspects - New Rel-16 NR bands and extension of existing NR bands | NR\_bands\_BW\_R16-UEConTest | Ongoing |
| 870061 | UE Conformance Test Aspects - RF requirements for NR frequency range 1 (FR1) | NR\_RF\_FR1-UEConTest | Ongoing |
| 910098 | UE Conformance Test Aspects - NR RF requirement enhancements for frequency range 2 (FR2) | NR\_RF\_FR2\_req\_enh-UEConTest | Ongoing |
| 911004 | UE Conformance Test Aspects - LTE-NR & NR-NR Dual Connectivity and NR CA enhancements | LTE\_NR\_DC\_CA\_enh-UEConTest | Ongoing |
| 920068 | UE Conformance Test Aspects - 29 dBm UE Power Class for LTE Band 41 and NR Band n41 | TEI16\_test, LTE\_NR\_B41\_Bn41\_PC29dBm-UEConTest | Completed |
| 890044 | UE Conformance Test Aspects - High power UE (power class 2) for EN-DC (1 LTE FDD band + 1 NR TDD band) | TEI16\_test, ENDC\_UE\_PC2\_FDD\_TDD-UEConTest | Completed |
| 940091 | UE Conformance Test Aspects - Common RF requirement configured output power for EN-DC with 3 uplink CC and 2 different bands (2CC LTE, 1CC NR FR1) | DC\_Pcmax\_3UL\_CC-UEConTest | Ongoing |
| Rel-17 | 900056 | UE Conformance - Rel-17 NR CA and DC; and NR and LTE DC Configurations | NR\_CADC\_NR\_LTE\_DC\_R17-UEConTest | Ongoing |
| 900055 | UE Conformance - New Rel-17 NR licensed bands and extension of existing NR bands | NR\_lic\_bands\_BW\_R17-UEConTest | Ongoing |
| 911000 | UE Conformance - High power UE (power class 2) for EN-DC with 1 LTE band + 1 NR TDD band | ENDC\_UE\_PC2\_R17\_NR\_TDD-UEConTest | Ongoing |
| 920065 | UE Conformance - SAR schemes for UE power class 2 (PC2) for NR inter-band Carrier Aggregation and supplemental uplink (SUL) configurations with 2 bands UL | TEI17\_test, NR\_SAR\_PC2\_interB\_SUL\_2BUL-UEConTest | Completed |
| 920066 | UE Conformance - Rel-17 High power UE for NR inter-band Carrier Aggregation with 2 bands downlink and x bands uplink (x=1,2) | NR\_PC2\_CA\_R17\_2BDL\_2BUL-UEConTest | Ongoing |
| 930051 | UE Conformance - Power Class 2 for EN-DC with x LTE bands + y NR band(s) in DL and with 1 LTE band +1 TDD NR band in UL (either x= 2, 3, y=1 or x=1, 2, y=2) | ENDC\_PC2\_R17\_xLTE\_yNR-UEConTest | Ongoing |
| 930052 | UE Conformance - High power UE (power class 1.5) for NR band n79 | TEI17\_test, NR\_UE\_PC1\_5\_n79-UEConTest | Completed |
| 930053 | UE Conformance - High power UE (power class 2) for NR band n34 | TEI17\_test, NR\_UE\_PC2\_n34-UEConTest | Completed |
| 930054 | UE Conformance - High power UE (power class 2) for NR band n39 | NR\_UE\_PC2\_n39-UEConTest | Ongoing |
| 930055 | UE Conformance - High-power UE (power class 1.5) operation in NR bands n77 and n78 | TEI17\_test, HPUE\_PC1\_5\_n77\_n78-UEConTest | Completed |
| 940092 | UE Conformance - UE RF requirements for Transparent Tx Diversity (TxD) for NR | [NR\_RF\_TxD-UEConTest](https://www.3gpp.org/DynaReport/WiSpec--940092.htm) | Ongoing |
| 960070 | UE Conformance - High power UE (power class 2) for one NR FDD band  Remark: n1 and n3 | TEI17\_test, NR\_PC2\_UE\_FDD-UEConTest | Completed |
| 960071 | UE Conformance - 4Rx support for NR band n8 | TEI17\_test, NR\_4Rx\_Bn8\_FWA-UEConTest | Completed |
| 960073 | UE Conformance - Introduction of DL 1024QAM for NR frequency range 1 (FR1) | NR\_DL1024QAM\_FR1-UEConTest | Ongoing |
| 960074 | UE Conformance - Solutions for NR to support non-terrestrial networks (NTN)  Remark: n255 and n256 | NR\_NTN\_solutions\_plus\_CT-UEConTest | Ongoing |
| 960080 | NR support for high speed train scenario in frequency range 2 (FR2)  Remark: n257, n258, n261 | NR\_HST\_FR2-UEConTest | Ongoing |
| 960083 | UE Conformance - NR Sidelink Relay | NR\_SL\_relay-UEConTest | Ongoing |
| 960084 | UE Conformance - NR Sidelink enhancement | NR\_SL\_enh-UEConTest | Ongoing |
| 960088 | UE Conformance - Introduction of UE TRP (Total Radiated Power) and TRS (Total Radiated Sensitivity) requirements and test methodologies for FR1 (NR SA and EN-DC)  Remark: n41, n28, n78, and n79 | NR\_FR1\_TRP\_TRS-UEConTest | Ongoing |
| 960090 | RF requirements enhancement for NR frequency range 1 (FR1) | NR\_RF\_FR1\_enh-UEConTest | Ongoing |
| 970070 | Further enhancements of NR RF requirements for frequency range 2 (FR2)  Remark: CA\_n258A-n260A, CA\_n257A-n259A, CA\_n258-n261, CA\_n260-n261 | NR\_RF\_FR2\_req\_enh2-UEConTest | Ongoing |
| 981033 | Downlink interruption for NR and EN-DC band combinations to conduct dynamic Tx Switching in Uplink | DL\_intrpt\_combos\_TxSW\_R17-UEConTest | Ongoing |
| Rel-18 | 981034 | NB-IoT (Narrowband IoT)/eMTC (enhanced Machine Type Communication) core & performance requirements for Non-Terrestrial Networks (NTN)  Remark: n255 and n256 | LTE\_NBIOT\_eMTC\_NTN\_req-UEConTest | Ongoing |

# 2 References

[1] R5-195406: "WF update for Rel-16 NR CADC band combinations WI".

[2] R5-197600: "WF update for Rel-16 NR CADC band combinations WI".

[3] R5-198048: "Discussion on how to update Rel-16 NR CA/DC band combinations WI".

[4] R5-201917: "Discussion on how to introduce Rel-16/15 NR CADC band combinations/new bands/new BWs into TS 38.521-1/-2/-3".

[5] R5-212566: "Way forward on how to bring contributions to "NR\_CADC\_NR\_LTE\_DC\_R16-UEConTest" WI and "NR\_CADC\_NR\_LTE\_DC\_R17-UEConTest" WI".

[6] R5-215709: "Handling of CA/DC basket WIs and HP (high power) WIs".

[7] R5-217504: "Way forward on how to bring contributions to "NR\_CADC\_NR\_LTE\_DC\_R16-UEConTest" WI and "NR\_CADC\_NR\_LTE\_DC\_R17-UEConTest" WI".

[8] R5-217767: "Checklist - NR CA; NR-DC and EN-DC configurations for RAN5#93-e".

[9] R5-217498: "Checklist - Rel-17 NR CA; NR-DC and EN-DC configurations for RAN5#93-e"

[10] R5-221397: "Discussion on 5G NR CADC configuration handling in RAN5".

[11] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".

[12] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone".

[13] 3GPP TS 38.101-3: "NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios".

[14] 3GPP TS 38.521-1: "NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: Range 1 Standalone".

[15] 3GPP TS 38.521-2: "NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Range 2 Standalone".

[16] 3GPP TS 38.521-3: “NR; User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios”.

[17] 3GPP TS 38.508-2: "5GS; User Equipment (UE) conformance specification; Part 2: Common Implementation Conformance Statement (ICS) proforma"

# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

**5G NR CADC configuration**: A NR CA, NR-DC, NR SUL, NE-DC or EN-DC configuration as specified in TS 38.101-1 [11], TS 38.101-2 [12] and TS 38.101-3 [13].

**Assigned band**: A 5G NR band is assigned to a company volunteering to take responsibility to make sure that the necessary contributions to include the band into RAN5 conformance test specifications are prepared, submitted and agreed in RAN5.

**Assigned configuration**: A 5G NR CADC Ongoing configuration is assigned to a company volunteering to take responsibility to make sure that the necessary contributions to include the configuration into RAN5 conformance test specifications are prepared, submitted and agreed in RAN5.

**Completed band**: All CRs required to make the 5G NR band completed have been agreed by RAN5 for inclusion in next version of impacted RAN5 conformance test specifications.

**Completed configuration**: All CRs required to make the 5G NR CADC configuration completed have been agreed by RAN5 for inclusion in next version of impacted RAN5 conformance test specifications.

**Configuration specific WIs**: A work item is to introduce new configurations into RAN5 test specifications.

**Feature specific configuration**: A configuration is included in the scope of a feature specific WI and is used to introduce new features into RAN4 technical specifications.

**Feature specific WIs**: A work item is to introduce new features into RAN5 test specifications.

**Interested Deployer**: An organization (e.g. railway union) interested in deploying a 5G NR band or 5G NR CADC configuration (e.g. 5G NR railway band or 5G NR railway CADC configuration), or a V2X company interested in deploying a 5G NR V2X band or 5G NR V2X CADC configuration, or an industry company (e.g. agriculture company, power company) interested in deploying a 5G NR band or 5G NR CADC configuration.

**Interested Operator**: An mobile network operator interested in deploying a 5G NR band or 5G NR CADC configuration.

**Ongoing band**: A 5G NR band that has been interested by at least one "Interested Operator" or "Interested Deployer" and is open for assignment or contributions in RAN5. As long as a 5G NR band has been interested by at least one "Interested Operator" or "Interested Deployer", it can be regarded as an Ongoing band no matter it has been assigned to a volunteering company or not.

**Ongoing configuration**: A 5G NR CADC configuration that has been interested by at least one "Interested Operator" or "Interested Deployer" and is open for assignment or contributions in RAN5. As long as a 5G NR CADC configuration has been interested by at least one "Interested Operator" or "Interested Deployer", it can be regarded as an Ongoing configuration no matter it has been assigned to a volunteering company or not.

**Ongoing fallback configuration**: A 5G NR CADC configuration that is a fallback to an Ongoing configuration.

**Pending band**: A 5G NR band that has not been interested by any operator or deployer yet in RAN5.

**Pending configuration**: A 5G NR CADC configuration that has not been interested by any operator or deployer yet in RAN5.

**Responsible Company**: A company that volunteers to take responsibility to make sure that the necessary contributions to include a 5G NR band or configuration into RAN5 conformance test specifications are prepared, submitted and agreed in RAN5.

**V2X configuration**: A V2X configuration as specified in TS 38.101-1 [11]] and TS 38.101-3 [13].

## 3.2 Symbols

None

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

BCS Bandwidth Combination Set

CADC Carrier Aggregation and Dual-Connectivity

CDS Completion Declaration Statement

CBW Channel Bandwidth

HP High Power

N/A Not Applicable

PC1.5 Power Class 1.5

PC2 Power Class 2

PC3 Power Class 3

WI Work Item

WP Work Plan

# 4 Guidelines to handle the RAN5 work items covered by PRD21

## 4.1 Guidelines to handle the 5G NR configuration specific WIs

The existing 5G NR **configuration specific WIs** are list in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** |
| Rel-15 | 760087 | UE Conformance Test Aspects - 5G system with NR and LTE  Sub-WI: Rel-15 NR bands, NR CA/DC and EN-DC configurations | TEI15\_test, 5GS\_NR\_LTE-UEConTest |
| Rel-16 | 830083 | UE Conformance Test Aspects - Rel-16 NR CA and DC; and NR and LTE DC Configurations | NR\_CADC\_NR\_LTE\_DC\_R16-UEConTest |
| Rel-17 | 900056 | UE Conformance - Rel-17 NR CA and DC; and NR and LTE DC Configurations | NR\_CADC\_NR\_LTE\_DC\_R17-UEConTest |

1. There is column of “Status” in the PRD21 5G NR CADC configuration list. All the configurations shall be set as “Pending” as default.
2. There is column of “Interested Operator” in the PRD21 5G NR CADC list. For a "Pending" configuration, only when there is at least one "Interested Operator" or "Interested Deployer" expressing its “interest” in this configuration, it can be set as “Ongoing” which is ready to be assigned. Otherwise, this configuration shall stay in the “Pending” state as default.
3. Operators or Deployers are requested to take up "Pending" status configurations from the PRD21 5G NR CADC list before “Tdoc number reservation deadline” to allow for contributions and progress at the upcoming meeting. Once a configuration has been taken up by operators or deployers, the "Interested Operator" column for the configuration will be tagged with interested operator or deployer and the status will be changed to "Ongoing" in the PRD21 5G NR CADC list.
4. Updated PRD21 5G NR CADC configuration list shall be sent out to the RAN5 reflector prior to "Tdoc number reservation deadline" for each RAN5 meeting.
5. No contributions shall be submitted for configurations tagged as "Pending" in the draft PRD21 5G NR CADC configuration list.
6. As an exception, if the updated draft PRD21 5G NR CADC configuration list cannot be available before the "Tdoc number reservation deadline", the deadline for taking up configurations by interested operator or deployer shall be extended pending on the 5G NR configuration specific WI rapporteurs' decision.
7. For the operator or deployer that doesn’t attend RAN5 in person, its name could also be filled in the column of “Interested Operator” by its agent vendor to show the industry needs. And the agent vendor shall also fill its names in the column of “Company” to indicate that the agent vendor will be in charge of facilitating the completion of the test cases for the corresponding configurations in RAN5. Any exceptions shall get the approval from RAN5 with justification before any corresponding contributions can be brought to RAN5.
8. In the PRD21 5G NR CADC list, the “Interested Operator” and “Company” could be filled in and the “Status” could be changed between the RAN5 meetings as well as during the meetings.
9. For an “Ongoing” 5G NR CADC configuration, if the listed operator or deployer is requesting to be removed from the “Interested Operator” column and no more interested operators or deployers are listed, the WI rapporteurs can set the status of the configuration back to “Pending” by providing the justification.
10. When RAN4 corresponding 5G NR CADC basket WI closes and there are no RAN5 “Ongoing” 5G NR CADC configurations anymore, the RAN5 5G NR CADC WIs can be regarded as “Closed”.
11. After a RAN5 5G NR CADC WI closes, if any RAN5 “Pending” 5G NR CADC configuration gains an interested operator or deployer, this configuration could be implemented under maintenance using appropriate TEIxx\_Test WI code as indicated in the PRD21 5G NR CADC configuration list. E.g., After RAN5 Rel-16 5G NR CADC WI close, if any RAN5 “Pending” Rel-16 5G NR CADC configuration gains an “Interested Operator”, this configuration could be implemented under WI codes "TEI16\_test, NR\_CADC\_NR\_LTE\_DC\_R16-UEConTest".
12. Considering the meeting efficiency, it is strongly suggested that all the configuration specific changes to Chapter 5 to be covered in a Jumbo CR submitted by Chapter 5 owner. Any other individual configuration specific change request to Chapter 5 is suggested to be merged into the Jumbo CR and the corresponding company will be added as a co-source company. Additional change requests not related to configuration specific changes can be submitted under feature specific WIs
13. No new configurations/new bands/new BWs shall be introduced into Chapter 5 of TS 38.521-1 [14], TS 38.521-2 [15] and TS 38.521-3 [16], unless the new configurations/new bands/new BWs have been completed in RAN4.
14. To avoid missing configuration specific changes to the test cases in Chapter 6/7 of TS 38.521-1 [14], TS 38.521-2 [15] and TS 38.521-3 [16] for any new configurations/new bands/new BWs,

If it is thought there are no configuration specific changes needed for Chapter 6/7 or only the changes to ΔTIB,c and ΔRIB,c are needed in Chapter 6/7, an paper shall be submitted to justify why no such changes to Chapter 6/7 are needed or why only the changes to ΔTIB,c and ΔRIB,c are needed in Chapter 6/7. Otherwise, any configuration specific change requests to Chapter 5 ONLY shall NOT be accepted by RAN5 except for the following cases:

* If there are already new configurations/new bands/new BWs related test cases in Chapter 6/7;
* If the configuration is an Inter-Band EN-DC configuration including FR2 1 NR CC (no impact on Chapter 6/7 as the Inter-Band EN-DC test cases including FR2 1 NR CC are anchor agnostic and implicitly covered by the NR single carrier FR2 Tx/Rx test cases in TS 38.521-2 for the FR2 NR band);
* If the configuration is an Inter-Band EN-DC configuration including FR2 >1 NR CC (no impact on Chapter 6/7 as the Inter-Band EN-DC test cases including FR2 >1 NR CC are anchor agnostic and implicitly covered by the NR CA FR2 Tx/Rx test cases in TS 38.521-2 for the FR2 NR bands);
* If the configuration is an Inter-Band EN-DC configuration including both FR1 and FR2  (no impact on Chapter 6/7 as no test case details are specified for the Inter-Band EN-DC including both FR1 and FR2)

1. Considering Chapter 5 is necessary for the corresponding test case validation, any change requests to test cases of Chapter 6/7 without any new/existing corresponding changes to Chapter 5 shall not be accepted by RAN5.
2. If there are any 5G NR CADC configuration(s) without UL configuration(s) to be involved in the 5G NR CADC configuration WIs, the corresponding 5G NR CADC configuration(s) with UL configuration(s) cannot be considered as completed before the involved 5G NR CADC configuration(s) without UL configuration(s) to be confirmed as completed.

## 4.2 Guidelines to handle the New NR bands and extension of existing NR bands WIs impacting 5G NR CADC configurations

The existing **New NR bands and extension of existing NR bands WIs** are list in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** |
| Rel-16 | 850062 | UE Conformance Test Aspects - New Rel-16 NR bands and extension of existing NR bands | NR\_bands\_BW\_R16-UEConTest |
| Rel-17 | 900055 | UE Conformance - New Rel-17 NR licensed bands and extension of existing NR bands | NR\_lic\_bands\_BW\_R17-UEConTest |

If there are any new NR bands and extension of the existing NR bands to be involved in the 5G NR CADC configuration WIs, the corresponding 5G NR CADC configuration(s) cannot be considered as completed before the involved new NR bands and the extended NR bands to be confirmed as completed.

The handling of the new NR bands shall follow the same rules as specified for 5G NR configuration specific WIs in clause 4.1 items 1 to 15.

For the SUL/SDL bands, the test cases need to be defined and implemented by using the corresponding SUL/SDL band configurations. Once the SUL/SDL band configurations to be assigned with “Interested Operator”, the corresponding SUL/SDL bands shall be assigned with the same “Interested Operator” and shall be set as “Ongoing” in the PRD21 5G NR CADC list.

For the newly introduced CBW extension of the "Completed" or “Ongoing” NR bands, its status shall be set as “Ongoing (CBW)” in the PRD21 5G NR CADC list even if without “Interested Operator”.

## 4.3 Guidelines to handle the 5G NR feature specific WIs impacting 5G NR CADC configurations

The existing 5G NR **feature specific WIs** are list in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** |
| Rel-15 | 760087 | UE Conformance Test Aspects - 5G system with NR and LTE  Except for Sub-WI “Rel-15 NR bands, NR CA/DC and EN-DC configurations” | TEI15\_Test, 5GS\_NR\_LTE-UEConTest |
| Rel-16 | 870061 | UE Conformance Test Aspects - RF requirements for NR frequency range 1 (FR1) | NR\_RF\_FR1-UEConTest |
| 910098 | UE Conformance Test Aspects - NR RF requirement enhancements for frequency range 2 (FR2) | NR\_RF\_FR2\_req\_enh-UEConTest |
| 911004 | UE Conformance Test Aspects - LTE-NR & NR-NR Dual Connectivity and NR CA enhancements | LTE\_NR\_DC\_CA\_enh-UEConTest |
| 870062 | UE Conformance Test Aspects - High power UE (power class 2) for EN-DC (1 LTE TDD band + 1 NR TDD band) | TEI16\_test, ENDC\_UE\_PC2\_TDD\_TDD-UEConTest |
| 890044 | UE Conformance Test Aspects - High power UE (power class 2) for EN-DC (1 LTE FDD band + 1 NR TDD band) | TEI16\_test, ENDC\_UE\_PC2\_FDD\_TDD-UEConTest |
| 940091 | UE Conformance Test Aspects - Common RF requirement configured output power for EN-DC with 3 uplink CC and 2 different bands (2CC LTE, 1CC NR FR1) | DC\_Pcmax\_3UL\_CC-UEConTest |
| Rel-17 | 911000 | UE Conformance - High power UE (power class 2) for EN-DC with 1 LTE band + 1 NR TDD band | ENDC\_UE\_PC2\_R17\_NR\_TDD-UEConTest |
| 920065 | UE Conformance - SAR schemes for UE power class 2 (PC2) for NR inter-band Carrier Aggregation and supplemental uplink (SUL) configurations with 2 bands UL | TEI17\_test, NR\_SAR\_PC2\_interB\_SUL\_2BUL-UEConTest |
| 920066 | UE Conformance - Rel-17 High power UE for NR inter-band Carrier Aggregation with 2 bands downlink and x bands uplink (x=1,2) | NR\_PC2\_CA\_R17\_2BDL\_2BUL-UEConTest |
| 930051 | UE Conformance - Power Class 2 for EN-DC with x LTE bands + y NR band(s) in DL and with 1 LTE band +1 TDD NR band in UL (either x= 2, 3, y=1 or x=1, 2, y=2) | ENDC\_PC2\_R17\_xLTE\_yNR-UEConTest |
| 940092 | UE Conformance - UE RF requirements for Transparent Tx Diversity (TxD) for NR | [NR\_RF\_TxD-UEConTest](https://www.3gpp.org/DynaReport/WiSpec--940092.htm) |
| 960071 | UE Conformance - 4Rx support for NR band n8 | TEI17\_test, NR\_4Rx\_Bn8\_FWA-UEConTest |
| 960073 | UE Conformance - Introduction of DL 1024QAM for NR frequency range 1 (FR1) | NR\_DL1024QAM\_FR1-UEConTest |
| 960074 | UE Conformance - Solutions for NR to support non-terrestrial networks (NTN)  Remark: n255 and n256 | NR\_NTN\_solutions\_plus\_CT-UEConTest |
| 960080 | NR support for high speed train scenario in frequency range 2 (FR2)  Remark: n257, n258, n261 | NR\_HST\_FR2-UEConTest |
| 960083 | UE Conformance - NR Sidelink Relay | NR\_SL\_relay-UEConTest |
| 960084 | UE Conformance - NR Sidelink enhancement | NR\_SL\_enh-UEConTest |
| 960088 | UE Conformance - Introduction of UE TRP (Total Radiated Power) and TRS (Total Radiated Sensitivity) requirements and test methodologies for FR1 (NR SA and EN-DC)  Remark: n41, n28, n78, and n79 | NR\_FR1\_TRP\_TRS-UEConTest |
| 960090 | RF requirements enhancement for NR frequency range 1 (FR1) | NR\_RF\_FR1\_enh-UEConTest |
| 970070 | Further enhancements of NR RF requirements for frequency range 2 (FR2)  Remark: CA\_n258A-n260A, CA\_n257A-n259A, CA\_n258-n261, CA\_n260-n261 | [NR\_RF\_FR2\_req\_enh2](https://www.3gpp.org/DynaReport/WiSpec--890059.htm)-UEConTest |
| 981033 | Downlink interruption for NR and EN-DC band combinations to conduct dynamic Tx Switching in Uplink | DL\_intrpt\_combos\_TxSW\_R17-UEConTest |
| Rel-18 | 981034 | NB-IoT (Narrowband IoT)/eMTC (enhanced Machine Type Communication) core & performance requirements for Non-Terrestrial Networks (NTN)  Remark: n255 and n256 | LTE\_NBIOT\_eMTC\_NTN\_req-UEConTest |

1. Only the “Ongoing” or “Completed” configurations in Rel-16 configuration specific WI can be used to complete the Rel-16 feature specific WIs. Otherwise, one specific “Ongoing” or “Completed” configuration in Rel-17 and forward configuration specific WIs shall be used to complete the Rel-16 feature specific WI. The corresponding progress shall be reflected both in the Rel-16 feature specific WI WP and the PRD21 5G NR bands and CADC configurations list.
2. Only the “Ongoing” or “Completed” configurations in Rel-17 configuration specific WI can be used to complete the Rel-17 feature specific WIs. Otherwise, one specific “Ongoing” or “Completed” configuration in Rel-18 and forward configuration specific WIs shall be used to complete the Rel-17 feature specific WI. The corresponding progress shall be reflected both in the Rel-17 feature specific WI WP and the PRD21 5G NR bands and CADC configurations list.
3. Only the feature specific configurations can be introduced into RAN5 specifications under the feature specific WIs. All the other configurations shall be introduced into RAN5 specifications under the configuration specific WIs.
4. All the “Ongoing” feature specific configurations shall be introduced under the corresponding feature specific WIs.

## 4.4 Guidelines to handle the 5G NR High Power WIs impacting 5G NR bands or CADC configurations

The 5G NR High Power WIs have also been included in the existing 5G NR **feature specific WIs** in RAN5.

The existing 5G NR **High Power configuration WIs** in RAN5 are list in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** |
| Rel-16 | 870062 | UE Conformance Test Aspects - High power UE (power class 2) for EN-DC (1 LTE TDD band + 1 NR TDD band) | ENDC\_UE\_PC2\_TDD\_TDD-UEConTest |
| Rel-17 | 911000 | UE Conformance - High power UE (power class 2) for EN-DC with 1 LTE band + 1 NR TDD band | ENDC\_UE\_PC2\_R17\_NR\_TDD-UEConTest |
| 920065 | UE Conformance - SAR schemes for UE power class 2 (PC2) for NR inter-band Carrier Aggregation and supplemental uplink (SUL) configurations with 2 bands UL | NR\_SAR\_PC2\_interB\_SUL\_2BUL-UEConTest |
| 920066 | UE Conformance - Rel-17 High power UE for NR inter-band Carrier Aggregation with 2 bands downlink and x bands uplink (x=1,2) | NR\_PC2\_CA\_R17\_2BDL\_2BUL-UEConTest |
| 930051 | UE Conformance - Power Class 2 for EN-DC with x LTE bands + y NR band(s) in DL and with 1 LTE band +1 TDD NR band in UL (either x= 2, 3, y=1 or x=1, 2, y=2) | ENDC\_PC2\_R17\_xLTE\_yNR-UEConTest |

The existing 5G NR **High Power band WIs** in RAN5 are list in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Release** | **UIC** | **3GPP Work Item Name** | **3GPP Work Item Acronym** |
| Rel-16 | 920068 | UE Conformance Test Aspects - 29 dBm UE Power Class for LTE Band 41 and NR Band n41 | TEI16\_test, LTE\_NR\_B41\_Bn41\_PC29dBm-UEConTest |
| Rel-17 | 930052 | UE Conformance - High power UE (power class 1.5) for NR band n79 | TEI17\_test, NR\_UE\_PC1\_5\_n79-UEConTest |
| 930053 | UE Conformance - High power UE (power class 2) for NR band n34 | TEI17\_test, NR\_UE\_PC2\_n34-UEConTest |
| 930054 | UE Conformance - High power UE (power class 2) for NR band n39 | NR\_UE\_PC2\_n39-UEConTest |
| 930055 | UE Conformance - High-power UE (power class 1.5) operation in NR bands n77 and n78 | TEI17\_test, HPUE\_PC1\_5\_n77\_n78-UEConTest |
| 960070 | UE Conformance - High power UE (power class 2) for one NR FDD band  Remark: n1 and n3 | TEI17\_test, NR\_PC2\_UE\_FDD-UEConTest |

1. All the general requirements shall be introduced by 5G NR feature specific WIs. Regarding the power class dependent requirements, i.e. MOP, MPR, A-MPR, SEM, ACLR, A-SEM, A-SE and REFSENS, the PC3 requirements shall be introduced by 5G NR band WIs or configuration specific WIs, and the HP requirements shall be introduced by HP band or configuration WIs.
2. HP band or configuration shall not be set as 100% until the corresponding PC3 band or configuration is confirmed as 100% completed.
3. It’s encouraged that the same company take responsibility of HP configuration and corresponding PC3 configuration. If different companies share the work, efficient coordination and co-operation would be required.

## 4.5 Guidelines to handle the 5G NR CADC fallback configurations without Interested Operator or Interested Deployer

There are 5G NR CADC fallback configurations without interested operator or deployer in “Interested Operator”column. However, as defined in Section 5.3A UE channel bandwidth for CA in TS 38.101-1 [11] and TS 38.101-2 [12], these fallback configurations still need to be completed as long as they are in the same fallback group of the configuration with the interested operator or deployer.

For these 5G NR CADC fallback configurations without interested operator or deployer, as long as they are in the same “fallback group” of the configuration with interested operator or deployer, they shall be tagged as “Ongoing (FB)” in the “Status” Column of the RAN5 PRD21 5G NR CADC list and are ready for accepting contributions. The configurations in the same fallback group should share the same “Responsible Company (Contact)”.

They also shall be tagged as “Completed (FB)” in the “Status” Column of the RAN5 PRD21 5G NR CADC list when they are 100% completed in the 5G NR CADC configuration WIs.

"Fallback group" applies to all intra-band contiguous band components in intra-band contiguous, intra-band non-contiguous or an inter-band configurations. See TS 38.101-1 [11], Table 5.3A.5-1 for FR1 and in TS 38.101-2 [12], Table 5.3A.4-1 for FR2 for definition of fallback groups.

# 5 5G NR bands and CADC configurations list

## 5.1 General

The RAN5 PRD21 5G NR bands and CADC configurations list attached to PRD21 is an macro enabled Excel file named "PRD21 5G NR bands and CADC configurations list vx.y.z" where vx.y.z is the same version number as the version number of this PRD.

The PRD21 5G NR bands and CADC configurations list includes the worksheets as listed in Table 5.1-1. Sub-clauses 5.2 to 5.4 describes the purpose and how to use the different worksheets.

Table 5.1-1: Work sheets in PRD21 5G NR bands and CADC configurations list.

|  |  |
| --- | --- |
| Worksheet name | Description |
| Introduction | Description of PRD21 NR bands, V2X bands and 5G NR CADC configurations list and statistics of number of NR bands, NR band extension, V2X bands items and 5G NR CADC configurations covered by RAN5 work items. |
| NR bands | List of NR bands and NR band CBW extension items and their status in RAN5. |
| 5G NR CADC configurations | List of 5G NR CADC specific configurations including NR CA, NR-DC, NR SUL, NE-DC, EN-DC configurations and their status in RAN5. |
| V2X bands | List of NR V2X bands and their status in RAN5. |
| V2X configurations | List of NR V2X configurations and their status in RAN5. |

## 5.2 Introduction worksheet

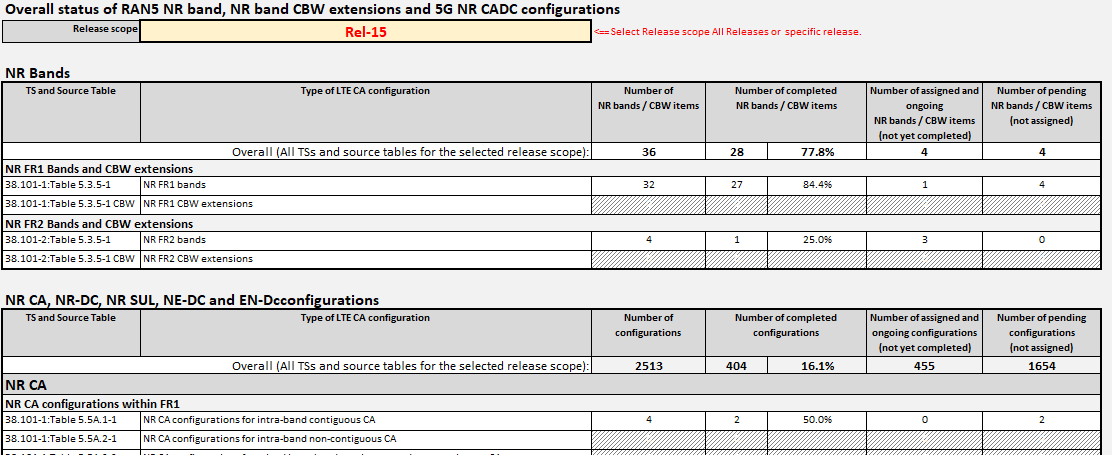


The worksheet "Introduction" contains a short description of the PRD21 NR bands, V2X bands and 5G NR CADC configurations lists and includes a table showing the overall status of the NR bands, V2X bands and 5G NR CADC Configurations vs TS 38.101-1 [11], TS 38.101-2 [12] and TS 38.101-3 [13] NR bands and 5G NR CADC configuration tables. By selecting a specific release or "All Releases" current RAN5 status of completed, assigned and pending NR bands, V2X bands and 5G NR CADC configurations is shown.

Picture 5.2-1 shows a snapshot of the table with overall status of NR bands and RAN5 5G NR CADC configurations for the case "Rel-15" has been selected. The data in Picture 5.2-1 reflect the status after RAN5#94-e (February 2022).

For the actual status see worksheet "Introduction" in the attached version of the attached PRD21 NR bands and 5G NR CADC list.

Picture 5.2-1: Overall status of RAN5 5G NR CADC configurations for the case "Rel-15" selected.



## 5.3 NR bands worksheet



### 5.3.1 Overview

Picture 5.3-1 shows a snapshot of the worksheet "NR bands". The list covers all NR bands and CBW extensions within the scope of RAN5 5G NR work items and based on the TS 38.101-1 (FR1) and TS 38.101-2 (FR2) versions as indicated in the top f the worksheet (see item 1 in Picture 5.3-1).

The purpose of the columns in the list are:

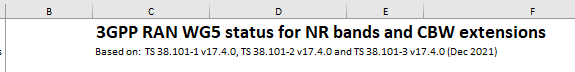
|  |  |  |
| --- | --- | --- |
| Column | | Description |
| A | Marked config | Indicates if the NR band/CBW extension is selected/marked as input to an assignment request or to create workplan/checklist for. |
| B | Release introduced in TS 38.101-x | The release the NR band/CBW extension was introduced in TS 38.101-1 [11] or TS 38.101-2 [12]. |
| C | Type of band | Indicates if the NR band/CBW extension is a FDD FR1, TDD FR1, SUL FR1, SDL FR1 or TDD FR2 band. |
| D | TS and Source Table | Indicates the source TS and Table number the NR band/CBW extension is specified in. |
| E | NR band / NR band CBW Extension | NR band/CBW extension label in format "nX" for NR bands and "nX CBW (<list of added CBWs>)"  For power classes beyond PC3 a power class suffix is used. E.g. for the NR band n1 the NR band column will show "n1" for PC3 and "n1 PC2" for PC2. |
| F | CBWs SCS[kHz]:[MHz]+...+[MHz] | List the covered CBWs for each SCS, 15 kHz, 30 kHz and 60kz for FR1 and for SCS 60kHz and 120 kHz for FR2.  CBW details is only shown for PC3. |
| G | Status | Status of RAN5 process ("Pending", "Ongoing" or "Completed") to introduce details for the NR band/CBW extension in RAN5 TSs and TRs. See clause 3.1 for the purpose of the different status indication in the RAN5 process to introduce NR bands/CBW extensions. |
| H | Completed Power Class(es) | List of all completed Power Classes. |
| I | RAN5 Completion Meeting | Indicates the RAN5 meeting the NR band/CBW extension was completed in RAN5 TSs and TRs for applicable power classes. |
| J | Completion Reference | Reference RAN5 CDS TDOC declaring the completion of the NR band/CBW extension for applicable power classes. |
| K | Interested deployer | Indicate the interested operator or deployer of the NR band/CBW extension for PC3. See clause 3.1 for the purpose of "Interested operator" and "Interested Deployer" in the RAN5 process to introduce NR bands/CBW extensions. |
| L | Responsible Company (contact) | Indicate the company name(s) and the contact name(s) for the company acting as responsible company to coordinate the contributions to secure all aspects for the PC3 NR band/CBW extension has been taken into account before the NR band/CBW extension is declared as completed. The workplans/checklists provided by PRD21 give guidance to the responsible company. See clause 3.1 for the purpose of "Responsible Company" in the RAN5 process to introduce NR bands/CBW extensions. |
| M | Assignment [RAN5 meeting] | Indicates the RAN5 meeting the NR band/CBW extension for PC3 was assigned to interested operator or deployer, and responsible company. |
| N | Applicable RAN5 WI code(s) for CRs | Indicates 3GPP WI code to be used in CRs for the NR band/CBW extension. |

The colour labelling of 5G NR bands and CBW extensions rows is:

|  |
| --- |
| Completed: Green row indicates that the 5G NR band / NR band CBW Extension item is complete in the RAN5 test specifications. Available for testing. |
| Ongoing: Yellow row indicates that the 5G NR band / NR band CBW Extension item is ongoing and assigned to at least one "Interested Deployer" and at least one "Responsible Company assignment". CRs can be submitted to RAN5 test specifications. |
| Ongoing: White row with black text indicates that the 5G NR band / NR band CBW Extension item is ongoing but pending assignment to a "Responsible Company". No CRs shall be submitted to the RAN5 specifications unless the company volunteers to be assigned as "Responsible Company". |
| Pending: White row with red text indicates that the 5G NR band / NR band CBW Extension item is pending assignment to an "Interested Deployer". No CRs shall be submitted to the RAN5 specifications. |

The column "Applicable RAN5 WI code(s) for CRs" shows the RAN5 WI code(s) to be specified on the CR coversheet for CRs to the 5G NR CADC configurations. See Picture 5.3-1.

Picture 5.3-1: Indication of source of TS 38.101-X [11,12,13].



### 5.3.2 Requesting assignment of NR bands and NR band CBW extensions

See picture 5.3-2 showing location of the different buttons referenced in the text below.

To submit an assignment request for "Interested Operator" or "Interested Deployer", and/or "Responsible Company" for one or more NR bands and/or NR band CBW extensions do:

Step 1: Select the "NR bands" worksheet.

Step 2: Mark NR bands and NR band CBW extension items to be included in the assignment request:

- Individual items can be marked/un-marked by double-clicking on the row with the item.

- Multiple items can be marked by first selecting multiple rows followed by pressing the "Mark selected items" button.

- All marked items can be un-marked by pressing the "Clear" button.

Step 3: Press the "Request assignment for marked items" button.

Step 4: In the pop-up window (see picture 5.3-3) select type of assignment request: "Interested operator", "Responsible company" or "Interested Operator and Responsible Company". Depending on selected type of assignment fill in interested operator or deployer, responsible company or both. If the assignment request includes responsible company, then fill in the company contact name.

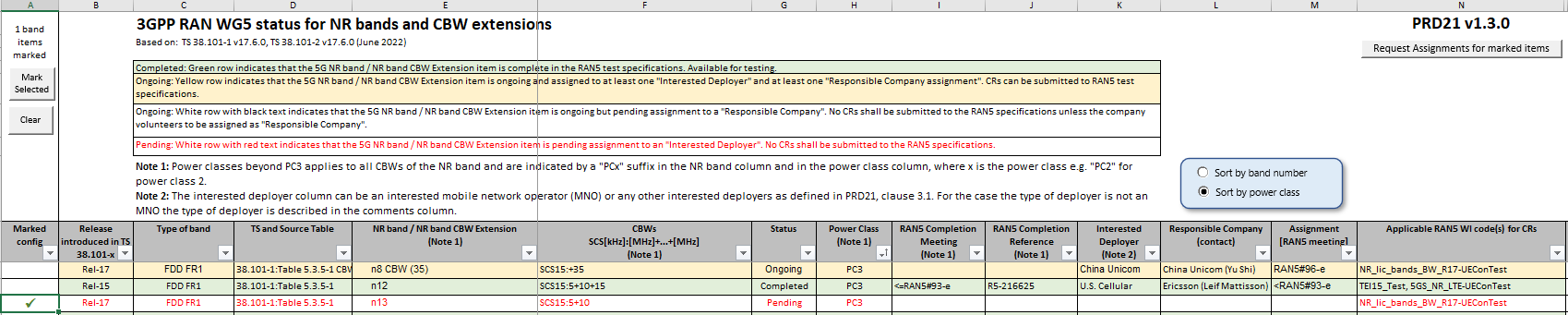
Step 5: Press the "Request Assignment" button (see picture 5.3-3).

Step 6: If Microsoft Outlook is supported then an email is created including the assignment request (see picture 5.3-4) including an Excel file with the requested configurations (see picture 5.3-5). Press the "Send" button to send the assignment request to the PRD rapporteur.  
  
If Microsoft Outlook is not supported then the request email need to be created manually. A text file with instructions and information to copy/cut and paste into the assignment request email will pop-up, see Picture 5.3-6 for an example.

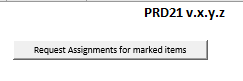
Step 7: The requested assignment is confirmed by the PRD rapporteur responding to the assignment request email.

When a responsible company has been assigned for a NR band or NR band CBW extension should the responsible company create a work plan as described in clause 6.2.

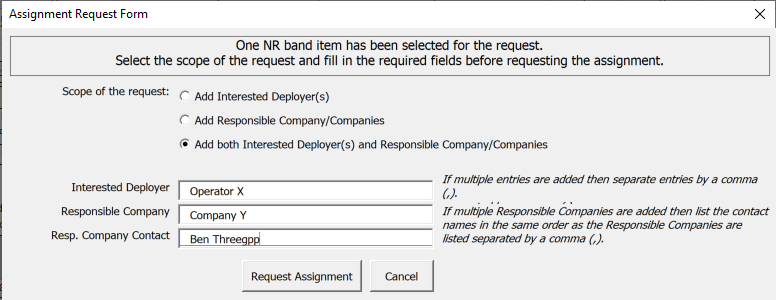
Picture 5.3-2: NR band worksheet overview.



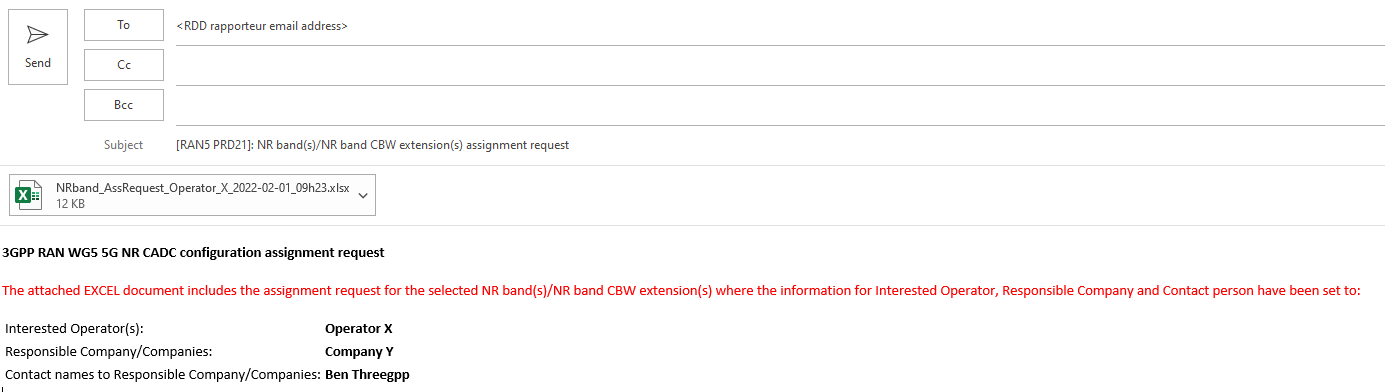
WI code to be used for CRs



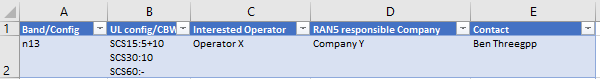
Picture 5.3-3: Assignment request form for NR bands and CBW extensions.



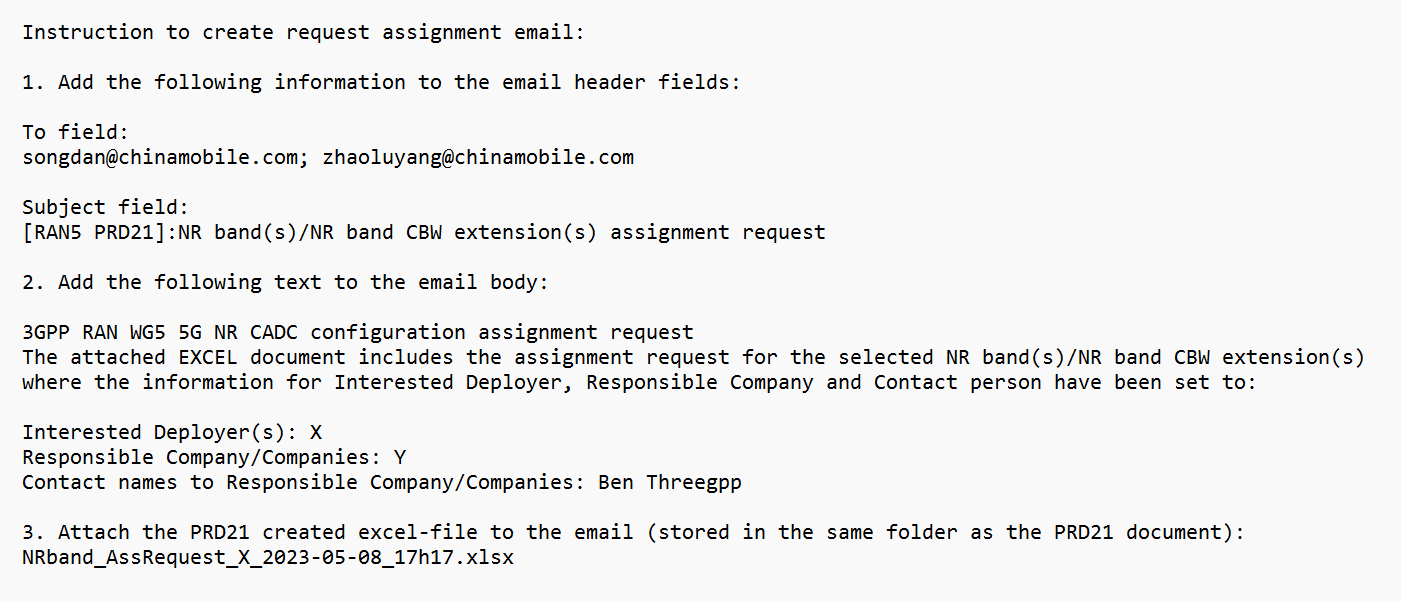
Picture 5.3-4: Example of an assignment request email for the case Microsoft Outlook is supported.



Picture 5.3-5: Example of attached EXCEL file attachment for an assignment request of a NR band CBW extension.



Picture 5.3-6: Example of text file with instructions what to include in the assignment request email for the case Microsoft Outlook is not supported.



## 5.4 5G NR CADC Configurations worksheet



### 5.4.1 Overview

Picture 5.4-1 shows a snapshot of the worksheet "5G NR CADC Configurations". The list covers all 5G NR CADC specific configurations including NR CA, NR-DC, NR SUL, NE-DC and EN-DC configurations within the scope of RAN5 5G NR work items and based on the TS 38.101-1,-2,-3 [11,12,13] versions as indicated in the top of the worksheet (see item 1 in Picture 5.4-1).

The purpose of the columns in the list are:

|  |  |  |
| --- | --- | --- |
| Column | | Description |
| A | Marked config | Indicates if the configuration is selected/marked as input to an assignment request or to create workplan/checklist for. |
| B | Release introduced in TS 38.101-x | The release the configuration was introduced in TS 38.101-1 [11], TS 38.101-2 [12] or TS 38.101-3 [13] |
| C | Type of configuration | Indicates if the configuration is a NR CA, NR-DC, NR SUL, NE-DC or EN-DC configuration. |
| D | TS and Source Table | Indicates the source TS and Table number the configuration is specified in. The format used is TS:Table <Table number>, e.g. " 38.101-3:Table 5.5A.1-1" for TS 38.101-3 and Table 5.5A.1-1. |
| E | Configuration | Indicates the DL configuration for NR CA, NR-DC, NE-DC and EN-DC configurations. For NR SUL it indicates the SUL band combination if the TS and Source Table is "38.101-1:Table 5.5C-1" else it indicates the SUL band combination with CA.  For power classes beyond PC3 a power class suffix is used for power classes beyond PC3. E.g. for the NR CA configuration CA\_n1A-n78A the configuration column will show "CA\_1A-n78A" for PC3 and "CA\_n1A-n78A PC2" for PC2. |
| F | Uplink configuration | Indicates the UL configuration for the configuration for NR CA, NR-DC, NE-DC and EN-DC configurations. For NR SUL it is not applicable if the TS and Source Table is "38.101-1:Table 5.5C-1" else it indicates the SUL configuration for the SUL band combination with CA indicated in column "Configuration". |
| G | Status | Status of RAN5 process ("Pending", "Ongoing" or "Completed") to introduce details for the configuration and power class (and its UL configuration when applicable) in RAN5 TSs and TRs. See clause 3.1 for the purpose of the different status indication in the RAN5 process to introduce 5G NR CADC configurations. |
| H | Power Class | Applicable Power Class. |
| I | RAN5 Completion Meeting | Indicates the RAN5 meeting the configuration was declared completed in RAN5 TSs and TRs for applicable power classes. |
| J | Completion Reference | Reference RAN5 CDS TDOC declaring the completion of the configuration for applicable power classes. |
| K | Interested deployer | Indicate the interested operator(s) or deployer(s) of the configuration. See clause 3.1 for the use of "Interested operator" in the RAN5 process to introduce 5G NR CADC configurations. |
| L | Responsible Company (contact) | Indicate the company (or companies) acting as responsible company to coordinate the contributions to secure all aspects for the configuration has been taken into account before the configuration is declared as completed. The workplans/checklists provided by PRD21 give guidance to the responsible company. See clause 3.1 for the use of "Interested operator" and "interested Deployer" in the RAN5 process to introduce 5G NR CADC configurations. |
| M | Assignment [RAN5 meeting] | Indicates the RAN5 meeting the configuration was assigned to interested operator or deployer, and responsible company. |
| N | Applicable RAN5 WI code(s) for CRs | Indicates 3GPP WI code to be used in CRs for the configuration.. |

The colour labelling of 5G NR CADC configurations in the list reflects the current status of the configurations:

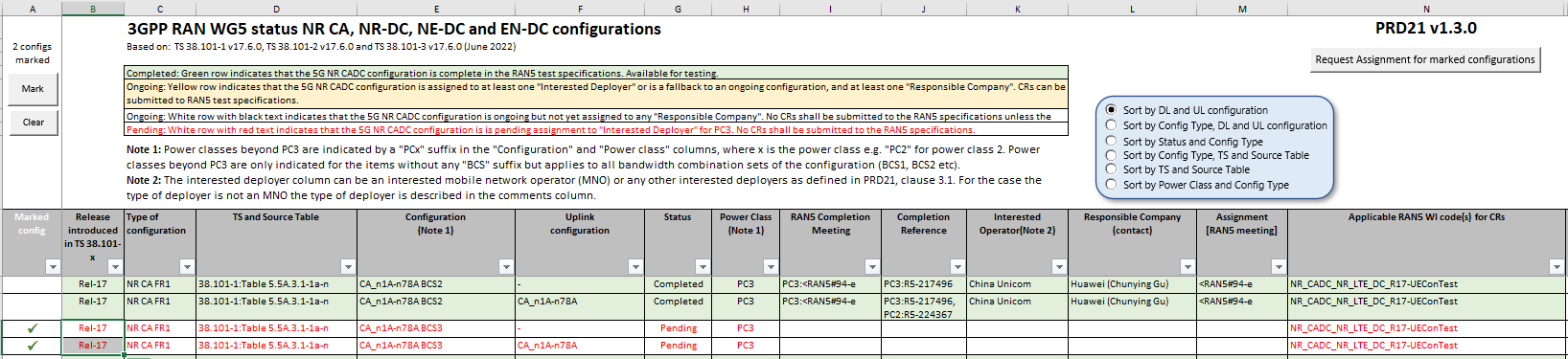
|  |
| --- |
| Completed: Green row indicates that the 5G NR CADC configuration is complete in the RAN5 test specifications. Available for testing. |
| Ongoing: Yellow row indicates that the 5G NR CADC configuration is assigned to at least one "Interested Deployer" or is a fallback to an ongoing configuration, and at least one "Responsible Company". CRs can be submitted to RAN5 test specifications. |
| Ongoing: White row with black text indicates that the 5G NR CADC configuration is ongoing but not yet assigned to any "Responsible Company". No CRs shall be submitted to the RAN5 specifications unless the company volunteers to be assigned as “Responsible Company”. |
| Pending: White row with red text indicates that the 5G NR CADC configuration is pending assignment to "Interested Deployer". No CRs shall be submitted to the RAN5 specifications. |

Item 2 in Picture 5.4-1 shows controls for marking configurations to request assignments as "Interested Operator" and "Responsible Company". See clause 6.1 for more details.

Item 3 in Picture 5.4-1 shows options buttons for pre-defined sort options of the list.

The column "Applicable RAN5 WI code(s) for CRs" (see item 5 in Picture 5.4-1) shows the RAN5 WI code(s) to be specified on the CR coversheet for CRs to the 5G NR CADC configuration.

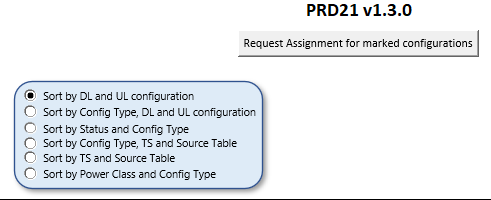
Picture 5.4-1: 5G NR CADC configuration worksheet overview.



**2**

**31**

**1**

A 5G NR CADC configurations in 38.101-x [11,12,13] clause 5.6A having UL CA and/or more than one BCS will in the PRD21 5G NR CADC list be split into multiple rows where each row is limited to without UL CA or with one UL CA configuration and one BCS.

The purpose of the splitting of the 38.101-x [11,12,13] 5G NR CADC configurations into multiple configurations is to allow progress of individual configurations dependent on industry interest.

### 5.4.2 Requesting assignment of 5G NR CADC configurations

See picture 5.4.2-1 showing location of the different buttons referenced in the text below.

To submit an assignment request for "Interested Operator" or "Interested Deployer" and/or "Responsible Company" for one or more 5G NR CADC configurations do:

Step 1: Select the "5G NR CADC Configurations" worksheet.

Step 2: Mark the 5G NR CADC configurations to be included in the assignment request:

- Individual items can be marked/un-marked by double-clicking on the row with the item.

- Multiple items can be marked by first selecting multiple rows followed by pressing the "Mark selected items" button.

- All marked items can be un-marked by pressing the "Clear" button.

Step 3: Press the "Request assignment for marked items" button.

Step 4: In the pop-up window (see picture 5.4.2-2) select type of assignment request: "Interested operator", "Responsible company" or "Interested Operator and Responsible Company". Depending on selected type of assignment fill in interested operator or interested deployer, responsible company, or both. If the assignment request includes responsible company, then fill in the company contact name.

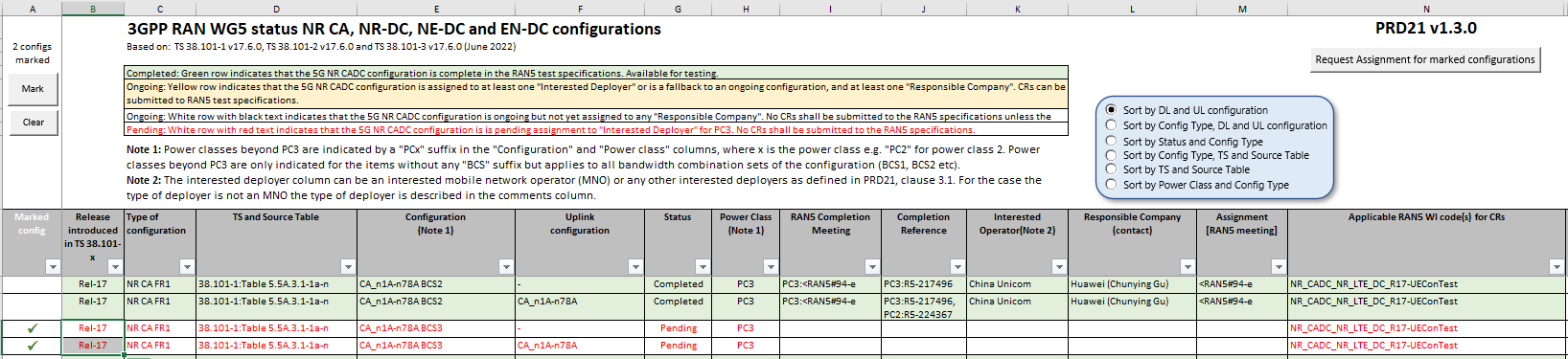
Step 5: Press the "Request Assignment" button (see picture 5.4.2-2).

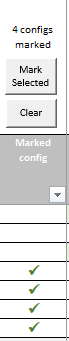
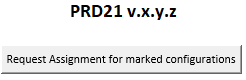
Step 6: If Microsoft Outlook is supported then an email is created including the assignment request (see picture 5.4.2-3) including an Excel file with the requested configurations (see picture 5.4.2-4). Press the "Send" button to send the request to the PRD rapporteur.  
  
If Microsoft Outlook is not supported then the request email need to be created manually. A text file with instructions and the information to copy/cut and paste into the assignment request email will pop-up , see Picture 5.4.2-5 for an example.

Step 7: The requested assignment is confirmed by the PRD rapporteur responding to the assignment request email.

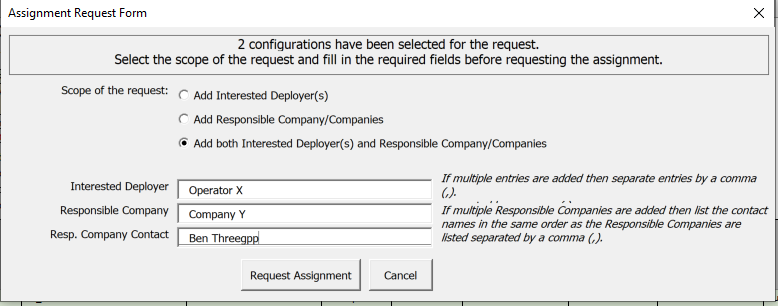
When a responsible company has been assigned for a 5G NR CADC configuration should the responsible company create a work plan as described in clause 6.2.

Picture 5.4.2-1: 5G NR CA DC configuration worksheet overview.

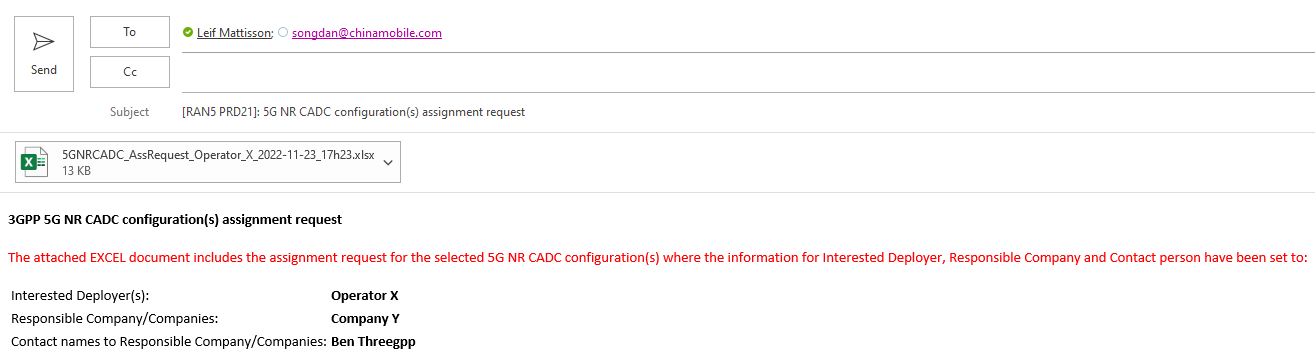


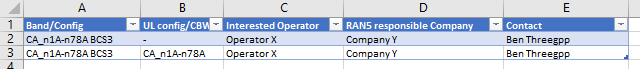
Picture 5.4.2-2: Assignment request form for 5G NR CADC configurations.



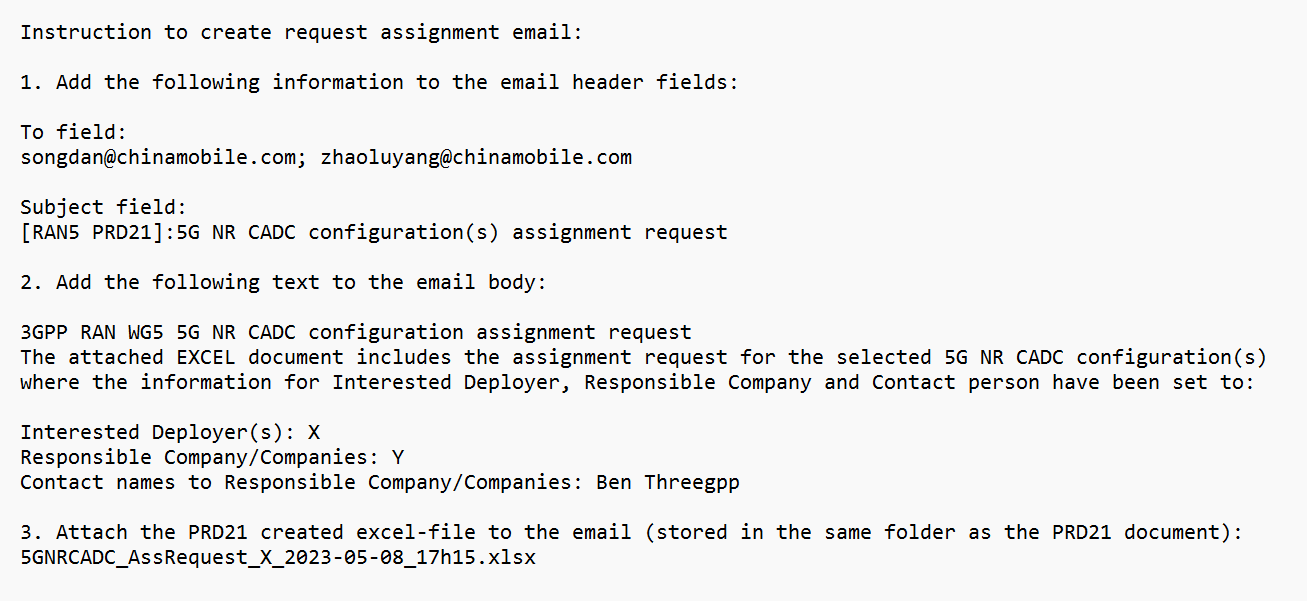
Picture 5.4.2-3: Example assignment request email.



Picture 5.4.2-4: Example of attached EXCEL file attachment for an assignment request of four 5G NR CADC configurations.



Picture 5.4.2-5: Example of text file with instructions what to include in the assignment request email for the case Microsoft Outlook is not supported.



## 5.5 5G NR V2X bands worksheet



### 5.5.1 Overview

Picture 5.5-1 shows a snapshot of the worksheet "V2X bands". The list covers all NR V2X bands within the scope of RAN5 5G NR work items and based on the TS 38.101-1 (FR1) versions as indicated in the top of the worksheet (see item 1 in Picture 5.5-1).

The purpose of the columns in the list are:

|  |  |  |
| --- | --- | --- |
| Column | | Description |
| A | Marked config | Indicates if the NR V2X band is selected/marked as input to an assignment request or to create workplan/checklist for. |
| B | Release introduced in TS 38.101-x | The release the NR V2X band was introduced in TS 38.101-1 [11]. |
| C | Type of band | Indicates if the NR V2X band is a NR V2X FR1 band. |
| D | TS and Source Table | Indicates the source TS and Table number the NR V2X band is specified in. |
| E | NR V2X band | NR V2X band label in format "nX" for NR bands. For power classes beyond PC3 a power class suffix is used to indicate the power class (e.g. " PC2"," PC1" etc.). |
| F | CBWs SCS[kHz]:[MHz]+...+[MHz] | List the covered CBWs for each SCS, 15 kHz, 30 kHz and 60kz for FR1. |
| G | Status | Status of RAN5 process ("Pending", "Ongoing" or "Completed") to introduce introducing details for the NR V2X band in RAN5 TSs and TRs. See clause 5.2 for the purpose of the different status indication in the RAN5 process to introduce NR V2X bands. |
| H | Completed Power Class(es) | List of all completed Power Classes. |
| I | RAN5 Completion Meeting | Indicates the RAN5 meeting the NR V2X band was completed in RAN5 TSs and TRs for applicable power classes. |
| J | Completion Reference | Reference RAN5 CDS TDOC declaring the completion of the NR V2X band for applicable power classes. |
| K | Interested Deployer | Indicate the interested deployer of the NR V2X band for all applicable power classes. |
| L | Responsible Company (contact) | Indicate the company name(s) and the contact name(s) for the company acting as responsible company to coordinate the contributions to secure all aspects for the NR V2X band for applicable power classes has been taken into account before the NR V2X band is declared as completed. The workplans/checklists provided by PRD21 give guidance to the responsible company. |
| M | Assignment [RAN5 meeting] | Indicates the RAN5 meeting the NR V2X band for applicable power classes was assigned to interested deployer, and responsible company. |
| N | Applicable RAN5 WI code(s) for CRs | Indicates 3GPP WI code to be used in CRs for the NR band/CBW extension. |

The colour labelling of 5G NR V2X bands rows is:

|  |
| --- |
| Completed: Green row indicates that the 5G NR V2X band item is complete in the RAN5 test specifications. Available for PC3 testing. |
| Ongoing: Yellow row indicates that the5G NR V2X band item is ongoing and assigned to at least one "Interested Deployer" and at least one "Responsible Company assignment". CRs can be submitted to RAN5 test specifications. |
| Ongoing: White row with black text indicates that the 5G NR V2X band item is ongoing but pending assignment to a "Responsible Company". No CRs shall be submitted to the RAN5 specifications unless the company volunteers to be assigned as "Responsible Company". |
| Pending: White row with red text indicates that the 5G NR V2X band item is pending assignment to "Interested Deployer " for PC3. No CRs shall be submitted to the RAN5 specifications. |

The column "Applicable RAN5 WI code(s) for CRs" shows the RAN5 WI code(s) to be specified on the CR coversheet for CRs to the 5G NR V2X band.

### 5.5.2 Requesting assignment of NR bands and NR band CBW extensions

Same as 5.3.2.

## 5.6 5G NR V2X Configurations worksheet



### 5.6.1 Overview

Below list covers all NR V2X configurations within the scope of RAN5 5G NR work items and based on the TS 38.101-1 and TS 38.101-3 [11,13] versions as indicated in the top of the worksheet.

The purpose of the columns in the list are:

|  |  |  |
| --- | --- | --- |
| Column | | Description |
| A | Marked config | Indicates if the configuration is selected/marked as input to an assignment request or to create workplan/checklist for. |
| B | Release introduced in TS 38.101-x | The release the configuration was introduced in TS 38.101-1 [11] or TS 38.101-3 [13] |
| C | Type of configuration | Indicates if the configuration is a NR V2X configuration. |
| D | TS and Source Table | Indicates the source TS and Table number the configuration is specified in. The format used is TS:Table <Table number>, e.g. " 38.101-3:Table 5.5E.2-1" for TS 38.101-3 and Table 5.5E.2-1. |
| E | Configuration | Indicates the V2X configurations. For power classes beyond PC3 a power class suffix is used to indicate the power class (e.g. "PC2:"). |
| F | Working mode | Indicates the working mode of each carrier in the V2X configurations. |
| G | PC3 Status | Status of RAN5 process ("Pending", "Ongoing" or "Completed") to introduce PC3 details for the configuration (and its UL configuration when applicable) in RAN5 TSs and TRs. See clause 5.1 for the purpose of the different status indication in the RAN5 process to introduce 5G NR V2X configurations. |
| H | Power Class | Indicate the power class of the UL configuration |
| I | RAN5 Completion Meeting | Indicates the RAN5 meeting the configuration was declared completed in RAN5 TSs and TRs for applicable power classes. |
| J | Completion Reference | Reference RAN5 CDS TDOC declaring the completion of the configuration for applicable power classes. |
| K | Interested Deployer | Indicate the Interested Deployer(s) of the configuration and applicable power classes. |
| L | Responsible Company (contact) | Indicate the company (or companies) acting as responsible company to coordinate the contributions to secure all aspects for the configuration of applicable power classes has been taken into account before the configuration is declared as completed. The workplans/checklists provided by PRD21 give guidance to the responsible company. |
| M | Assignment [RAN5 meeting] | Indicates the RAN5 meeting the configuration was assigned to Interested Deployer and Responsible Company. |
| N | Applicable RAN5 WI code(s) for CRs | Indicates 3GPP WI code to be used in CRs for the configuration. |

The colour labelling of 5G NR V2X configurations in the list reflects the current status of the configurations:

|  |
| --- |
| Completed: Green row indicates that the 5G NR V2X configuration is complete in the RAN5 test specifications. Available for testing. |
| Ongoing: Yellow row indicates that the 5G NR V2X configuration is assigned to at least one "Interested Deployer" or is a fallback to an ongoing configuration, and at least one "Responsible Company". CRs can be submitted to RAN5 test specifications. |
| Ongoing: White row with black text indicates that the 5G NR V2X configuration is ongoing but not yet assigned to any "Responsible Company" . No CRs shall be submitted to the RAN5 specifications unless the company volunteers to be assigned as “Responsible Company”. |
| Pending: White row with red text indicates that the 5G NR V2X configuration is pending assignment to "Interested Deployer ". No CRs shall be submitted to the RAN5 specifications. |

### 5.6.2 Requesting assignment of 5G NR V2X configurations

Same as 5.4.2.

# 6 Responsible Company guidelines

## 6.1 General

Editor's note: Not all WP templates as listed in Table 6.1-1 are included in this version of PRD21. See the attached zip file named "WP templates" for available WP templates in this version of PRD21.

PRD21 includes a zip-file with workplan/checklist templates (WP templates) as listed in Table 6.1-1. The WP templates are divided by type of configuration (NR Band, NR CBW, NR CA, NR-DC, NR SUL, NE-DC and EN-DC), power class (PC2, PC3) and frequency range (FR1 and FR2). No WP templates are included for the case of configuration including both NR FR1 and FR2 as RAN5 concluded that those are not testable.

Table 6.1-1: WP templates in the PRD21 “WP templates” Zip-file.

|  |  |
| --- | --- |
| WP template name | Description |
| NR band and NR band CBW extensions | |
| NR band and CBW FR1 | WP template/checklist for introducing one or more NR bands and/or one or more new channel bandwidths to NR bands into RAN5 TSs and TRs depending on if the band is for FR1 or FR2. |
| NR band and CBW FR2 |
| Power Class 3 | |
| WP NR CA PC3 FR1 | WP template/checklist for introducing one or more NR CA Power Class 3 configuration(s) into RAN5 TSs and TRs depending on if the configuration(s) are within FR1, within FR2 or between FR1 and FR2. |
| WP NR CA PC3 FR2 |
| WP NR CA PC3 FR1+FR2 |
| WP NR-DC PC3 FR1 | WP template/checklist for introducing one or more NR-DC Power Class 3 configuration(s) into RAN5 TSs and TRs depending on if the configuration(s) are within FR1 or between FR1 and FR2. |
| WP NR-DC PC3 FR1+FR2 |
| WP NR SUL PC3 FR1 | WP template/checklist for introducing one or more NR SUL Power Class 3 configuration(s) into RAN5 TSs and TRs for FR1. |
| WP NE-DC PC3 FR1 | WP template/checklist for introducing one or more NE-DC Power Class 3 configuration(s) into RAN5 TSs and TRs depending on if the configuration(s) are within FR1 or within FR2. |
| WP NE-DC PC3 FR2 |
| WP EN-DC PC3 FR1 | WP template/checklist for introducing one or more EN-DC Power Class 3 configuration(s) into RAN5 TSs and TRs depending on if the configuration(s) are within FR1, within FR2 or between FR1 and FR2. |
| WP EN-DC PC3 FR2 |
| WP EN-DC PC3 FR1+FR2 |
| Power Class 2 | |
| WP NR SUL PC2 FR1 | WP template/checklist for introducing one or more NR SUL Power Class 2 configuration(s) into RAN5 TSs and TRs for FR1. |
| WP EN-DC PC2 FR1 | WP template/checklist for introducing one or more EN-DC Power Class 2 configuration(s) into RAN5 TSs and TRs for FR1. |
| WP NR CA PC2 FR1 | WP template/checklist for introducing one or more NR CA Power Class 2 configuration(s) into RAN5 TSs and TRs for FR1. |

The WP templates are used by the responsible company as a guideline and checklist how to introduce and document the introduction of the NR bands, NR band CBW Extensions and 5G NR CADC configurations into the relevant RAN5 technical specifications and technical reports.

The completed WP is also used in the final step to confirm completion of NR bands, NR CBW extensions and 5G NR CADC configurations by attaching the WP to the RAN5 CDS declaration, sub-clause 6.4.

A WP may include one or more NR bands, NR CBW extensions or 5G NR CADC configurations.

The WP has three outline levels:

Outline Level 1: Showing overview of recommended workflow steps to introduce the NR bands, NR CBW extensions or 5G NR CADC configurations

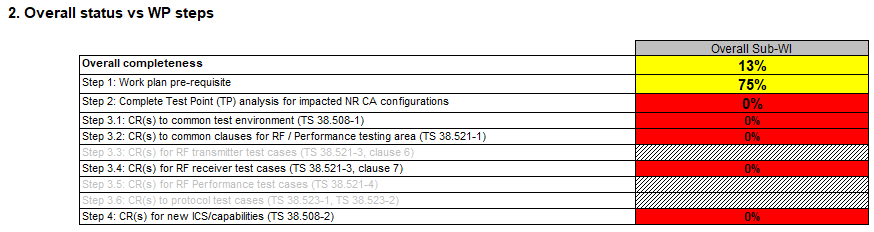
Outline Level 2: Showing all WP items under each workflow step.

Outline Level 3: Showing all details of the WP (as Outline Level 2 + details of WP scope and overall status).

The outline level is selected in the upper left corner of the WP by selecting 1, 2 or 3: 

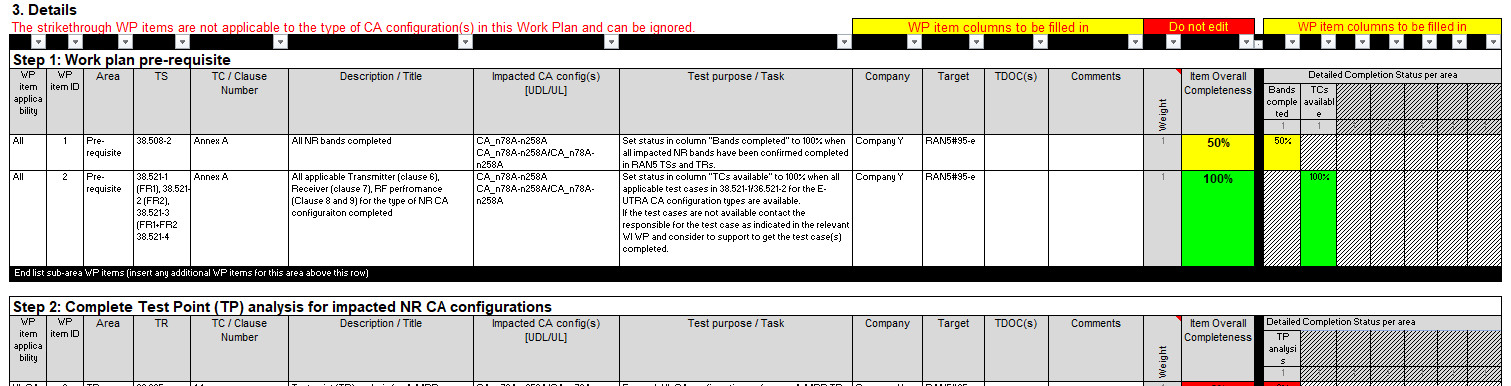
The WP is structured in the recommended workflow steps to introduce the new NR band(s), NR CBW Extension(s) or 5G NR CADC configuration(s) in RAN5 technical specifications and technical reports. The overall completion and the completion of each workflow step is shown in section 2 of the WP, see Picture 6.1-1. The completion status is calculated based on the reported status for each WP item in section 3 of the WP.

Picture 6.1-1: WP workflow steps and WP overall status information (NR CA WP).



For each workflow step the WP includes a number of WP item rows with status columns to indicate progress and completion of the WP item tasks, see Picture 6.1-2 for an example of WP item rows for work flow step 1.

Picture 6.1-2: Example of a workflow step and its WP item rows (NR CA WP).



The applicable WP item rows are dependent on the type of NR band, NR CBW extension or 5G NR CADC configurations covered by the WP.

## 6.2 Creating a WP/Checklist

Note: The guideline in this clause uses a set of NR CA PC3 FR1 configurations as an example to create a NR CA PC3 FR1 workplan. Creating work plans for other type of target configurations follows the same principles.

To create a WP/Checklist do:

1. Select the relevant WP template in the PRD21 WP templates zip-file and save it on Your computer using the following name convention:

WP filename: <WP template name>-<Company>-<WP scope label>, where

<WP template name> is the name of the WP template as picked from the WP templates zip-file,

<Company> is name of Your company (use short abbreviation if possible), and

<WP scope label> is a suitable short label of the scope of the WP

Example:

<WP template name> = "WP EN-DC PC3 FR1"

<Company> = "Ericsson"

<WP scope label> = "2bSet1" (two bands, configuration set 1)

=> WP file name = "WP EN-DC PC3 FR1-Ericsson-2bSet1"

2. Open the saved WP.

3. Select the "WP scope" worksheet and do:

- Fill in the Work Plan scope information (rows 5 to 8). See Picture 6.2-1 for an example.

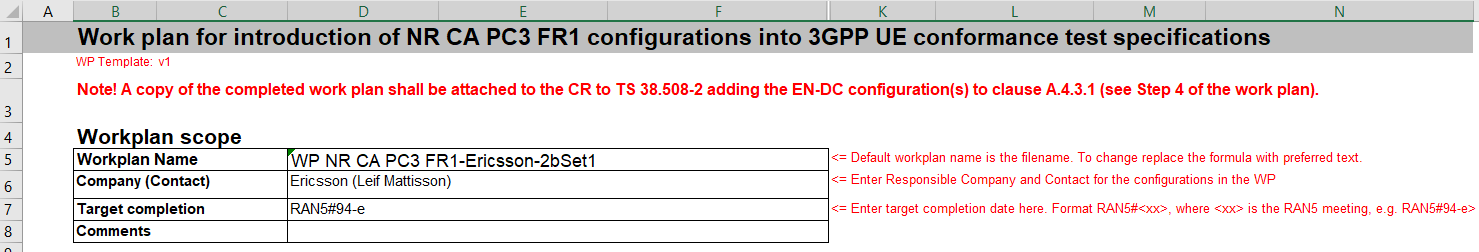
- Select the target NR bands, NR band CBW extensions or 5G NR CADC configurations from the PRD21 "5G NR bands and CADC configurations" list as described in the WP scope worksheet (step 1). See Picture 6.2-2 for an example.

- Paste the selected target configurations in the table as described in the WP scope worksheet (steps 2 to 3). See Picture 6.2-3 for an example.

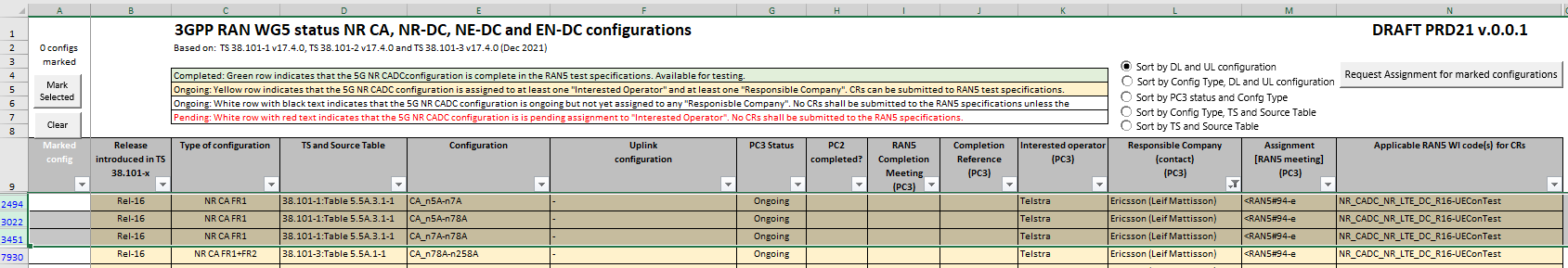
4. Save the workplan.

5. The work plan is ready for use. See sub-clause 6.3 for guideline of maintaining the WP.

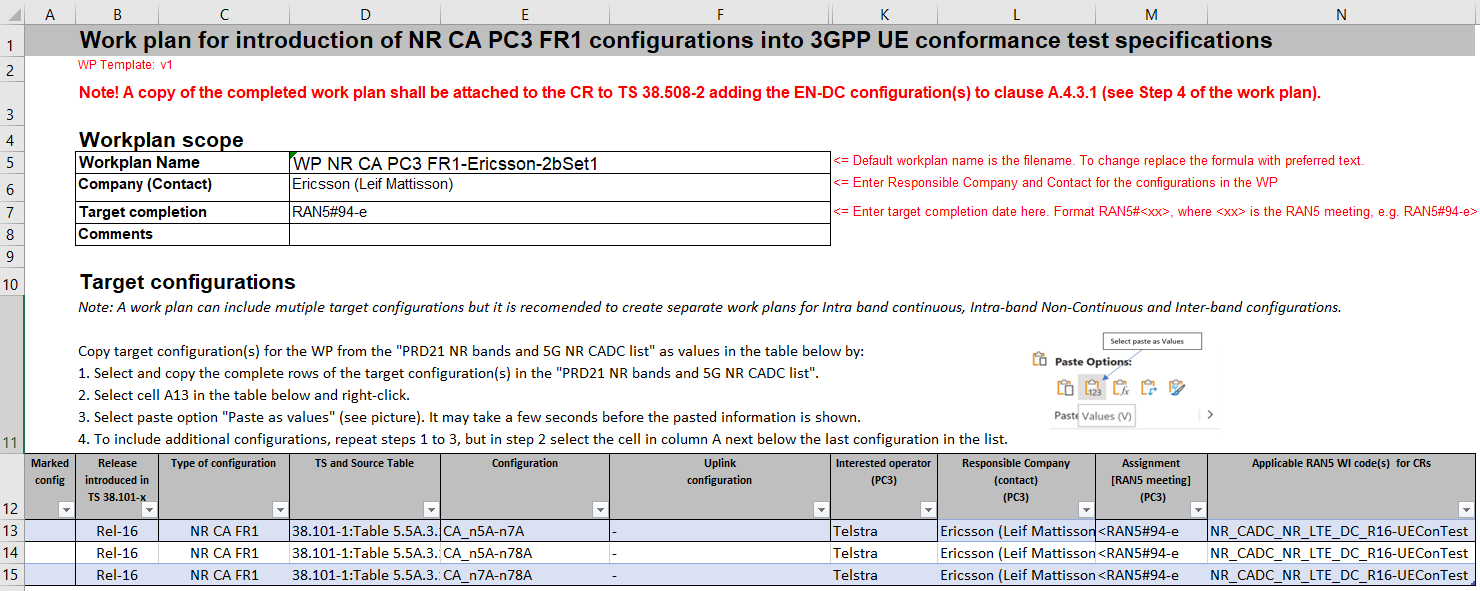
Picture 6.2-1: Example Workplan scope filled in for a NR CA PC3 FR1 workplan.



Picture 6.2-2: Example: Selecting target configurations CA\_n5A-n7A, CA\_n5A-n78A and CA\_7A-n78A in the PRD21 "5G NR bands and CADC configurations" list.



Picture 6.2-3: Example: Target configurations added to the NR CA PC3 FR1 workplan.



## 

## 6.3 Maintaining the WP

The columns marked as "WP item columns to be filled in" shall be filled in showing what have been done to complete the WP items. The purpose of the different columns is (see Picture 6.3-1):

- The "Company" column is used to track company responsibility for the WP item in case more companies than the assigned company of the 5G NR CADC configurations have contributed.

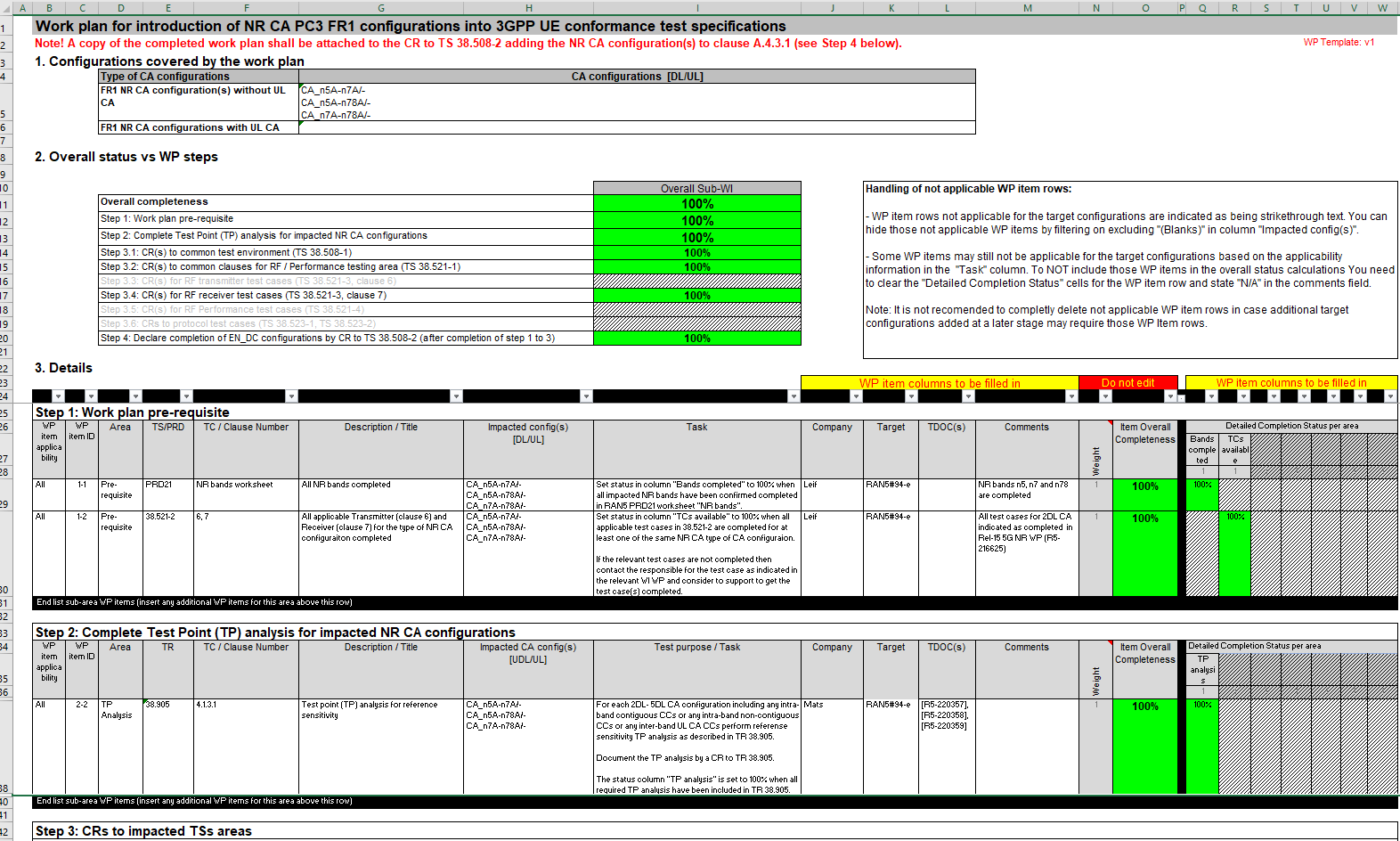
- The "Target" column is by default linked to the values of the target completion date specified in the WP header. If needed specific target for a WP item can be added by replacing the current formula in the target column with specific target information for the WP item.

- The "TDOC(s)" column is used to track RAN5 contributions (CRs) progressing and completing the WP items.

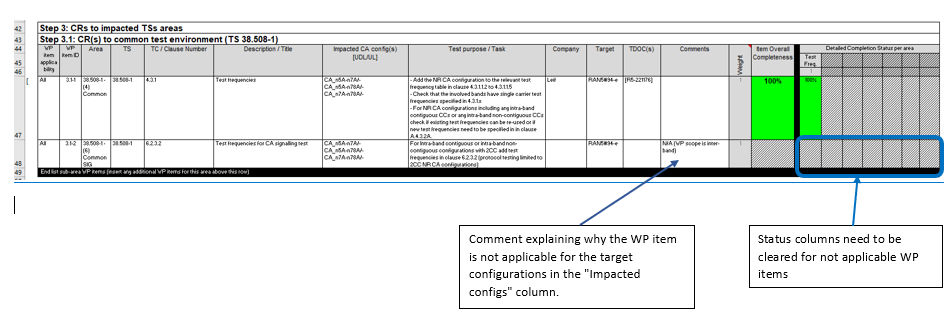
- The "Comments" column can be used to add additional comments as needed for the WP items. E.g., for the case no changes were needed for the WP item then it is useful to add a comment "No changes needed" as justification for setting the WP item as completed (100%).

- WP item status columns are used to state the current status (0% to 100%) for the different areas covered by the status columns. As default the WP template have the applicable status columns set to "0%". In case a WP item is not applicable for the specific type of configurations then need all the status column be cleared (delete content of the status columns for the WP item). See Picture 6.3-2 for an example of a WP item changed to be made not applicable for the target configurations.

Picture 6.3-1: Example: WP overall status and WP item columns (WP based on NR CA PC3 FR1 workplan template).



Picture 6.3-2: Example of WP item (WP item ID "3.5-2"not applicable for target configurations (WP based on NR CA PC3 FR1 workplan template).



## 6.4 Reporting a NR bands, NR band CBW extensions and 5G NR CADC configuration as completed

When NR bands, NR band CBW extensions and 5G NR CADC configurations are completed in RAN5 specifications, the responsible company submit a Completion Declaration Statement (CDS) document based on the PRD21 CDS form as a RAN5 official TDOC. The CDS document may be submitted at the same meeting as the CRs completing a configuration are agreed.

In the CDS form the responsible company fill in the following information (see Picture 6.4-1):

- affected PRD21 NR bands or 5G NR CADC configurations list;

- affected power class;

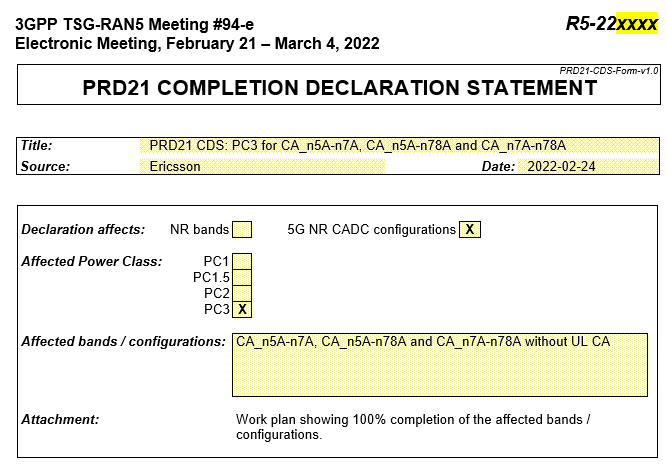
- affected bands/configurations covered by the declaration.

The responsible company shall attach the completed work plan (based on the WP templates in PRD21) to the CDS document showing the completion of the NR bands, NR band CBW extensions or 5G NR CADC configurations.

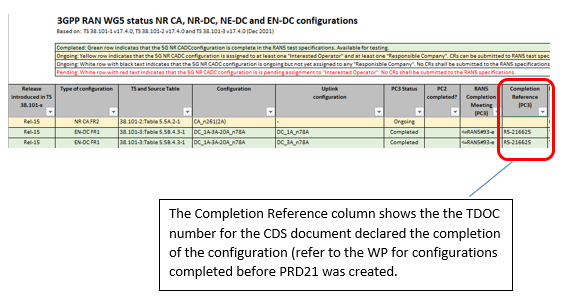
The PRD21 CDS form and WP templates can be found as attachments to PRD21.

Based on the PRD21 CDS document submitted at a meeting, the PRD21 rapporteur updates the status of the declared bands/configurations into "Completed" and adds the RAN5 TDOC number of the CDS document to the column "Completion reference" in the 5G NR CADC configuration list. See Picture 6.4-2,

Picture 6.4-1: PRD21 CDS form example



Picture 6.4-2: Example of reference of CDS document in 5G NR CADC configuration list



# 7 CR author guideline for selecting WI code for CRs

Any CR submitted to RAN5 to introduce or update details for a NR band, NR band CBW extension or 5G NR CADC configuration in RAN5 technical specifications and technical reports shall use the WI code as indicated in the PRD21 NR bands and 5G NR CADC configurations list in worksheet "NR bands" and "5G NR CADC Configurations" respectively.

# 8 PRD rapporteur guidelines

## 8.1 PRD21 rapporteur and WI rapporteur responsibilities

The PRD21 rapporteur together with support of the RAN5 rapporteurs for NR bands, NR band CBW extensions and 5G NR CADC configuration work items is responsible for:

- Keeping the NR band and 5G NR CADC configuration list up to date with latest version of TS 38.101-1 [11], TS 38.101-2 [12] and TS 38.101-3 [13] within the scope of RAN5 work items.

- Handling assignment of Interested Operator/Deployer and volunteering companies for NR bands, NR band CBW extensions and 5G NR CADC configurations.

- Maintaining the status of completed NR bands, NR band CBW extensions and 5G NR CADC configurations in the NR bands and 5G NR CADC configurations worksheets.

## 8.2 Handling assignment requests

Basing on the PRD21 rapporteur received assignment request emails, the PRD21 rapporteur shall update the NR bands and 5G NR CADC configuration lists by:

- Adding the interested operator/deployer, responsible company and responsible company contact person to the "NR bands" worksheet for the requested NR bands and NR Band CBW extensions; and to the "5G NR CADC Configurations " worksheet for the request 5G NR CADC configurations.

- Add the RAN5 meeting the request was received in column "RAN5 Assignment [RAN5 meeting]".

- Confirm the assignment by responding to the request email.

## 8.3 Update the PRD21 5G NR CADC list when new version of TS 38.101-x is published

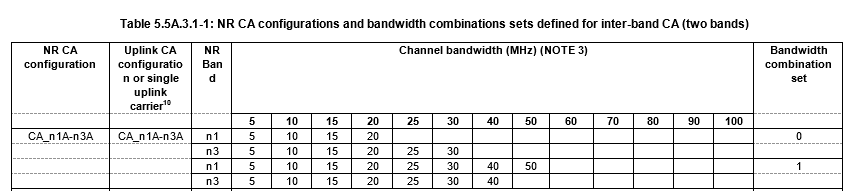
### 8.3.1 Update of the "NR bands" and "5G NR CADC Configurations" worksheets

Add any new or changed NR bands, NR bands CBW extensions and 5G NR CADC configurations (and its bandwidth combination set, BCS) in accordance to the latest version of 38.101-x [11,12,13] up to the release covered by the RAN5 NR bands, NR band CBW extensions and 5G NR CADC work items listed in clause 1.

The column "Applicable RAN5 WI code(s) for CRs" is set in accordance to the current applicable WI codes as listed in clause 1 depending on the current status of the RAN5 WI the configuration belongs to.

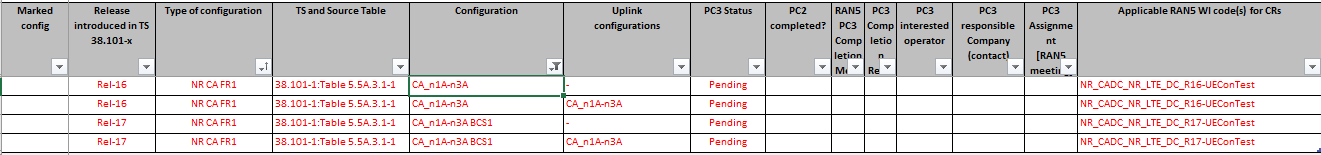
**Example: 2D/2UL 5G NR CADC configuration** **CA\_1A-n3A**

38.101-x [11,12,13] v17.4.0, Table 5.5A.3.1-1 specifies the NR CA configuration CA\_1A-3A as:



BCS0 was introduced in Rel-16 and BCS1 in Rel-16 of TS 38.101-1 [11].

For PRD21 CA list this configuration and its UL CA configurations are split into separate rows for each BCS and for each UL CA configuration as well as one row each for each BCS for the case without UL CA:



## 8.4 Update the PRD21 after end of RAN5 meetings

### 8.4.1 Update status of NR bands, NR band CBW Extensions and 5G NR CADC Configurations

Basing on the submitted CDS documents to a RAN5 meeting declaring completion of NR bands, NR band extensions and 5G NR CADC Configurations, the PRD rapporteurs change the status to "Completed", add the RAN5 meeting to column "RAN5 Completion" and add the reference to the agreed CDS document in column "Completion Reference".

### 8.4.2 Update when a RAN5 NR bands, NR band CBW Extensions or 5G NR CADC basket WI is closed

When a NR bands, NR band extension and RAN5 5G NR CADC basket work item has been closed, the following need to be updated:

- For each NR band, NR Band extension or 5G NR CADC configuration of the closed WI add "TEIxx\_Text," before the existing WI code in column "Applicable RAN5 WI code(s) for CRs" where x is the number of the release, e.g. 15 for Rel-15, etc.

## 8.5 Update the WP templates

When a WP template need to be updated pay attention to not overwrite cells with formulas.

Add new WP items by copying an existing WP item row and inserting above the relevant black row under each WP step area and modifying as needed.

## 8.6 Update when PRD21 rapporteur is changed

When a new rapporteur is assigned to PRD21 do:

* In the "Revision History" worksheet, update the PRD21 contact person details, including Name, Company and email address. It is important that the email address is correct as it will be used in the assignment request emails.

Annex A (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2022-2 | RAN5#94-e | R5-221398 | - | - | - | First version | 1.0.0 |
| 2022-6 | RAN5#95-e | R5-222224 | - | - | - | Updates at RAN5#95-e | 1.1.0 |
| 2022-8 | RAN5#96-e | R5-224228 | - | - | - | Updates at RAN5#96-e | 1.2.0 |
| 2022-11 | RAN5#97 | R5-226330 | - | - | - | Updates at RAN5#97 | 1.3.0 |
| 2023-3 | RAN5#98 | R5-230417 | - | - | - | Updates at RAN5#98 | 1.4.0 |
| 2023-3 | Post RAN5#98 | - | - | - | - | Update to the PRD21 5G NR CADC configuration Excel workbook macros to avoid error message "Compile error: Can't find project or library" when the workbook is opened in older versions of Microsoft Windows. No changes introduced to the content of configuration in the workbook. | 1.4.1 |
| 2023-5 | RAN5#99 | R5-23XXXX | - | - | - | Updates at RAN5#99 | 1.5.0 |