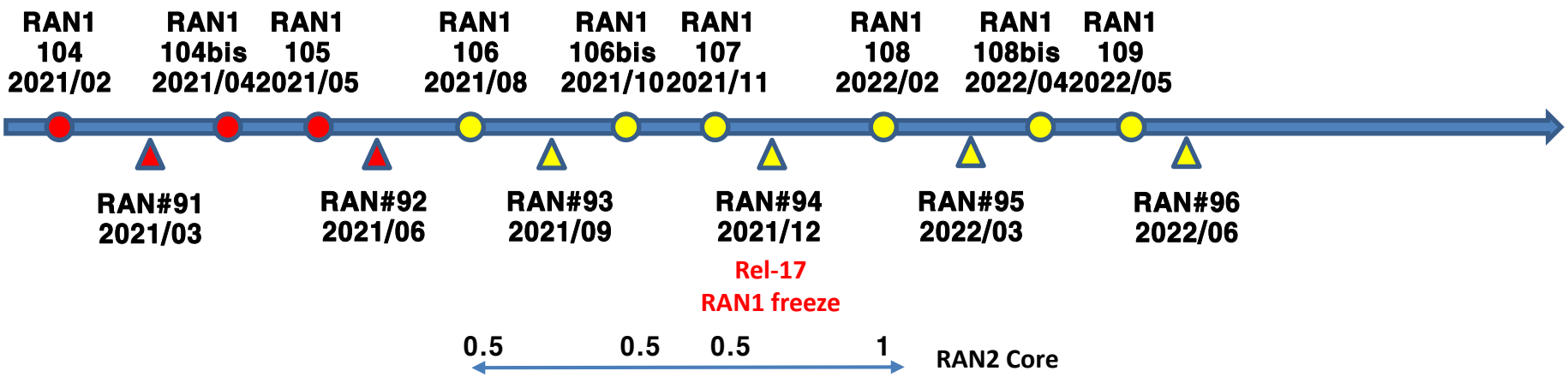
3GPP TSG RAN Meeting #92-e **RP-211186**
Electronic Meeting, June 14-18, 2021

Agenda item:	9.7.1.1
Source:	Samsung
Title:	On the scope of Rel-17 NR_FeMIMO
Document for:	Discussion and Decision

Rel.17 FeMIMO: overall assessment on progress



- Completed 6 out of 9 RAN1 meetings
  - With 3 RAN1 meetings left, main focus is on resolving remaining details
- Most items are <u>on track</u> despite the eMeeting format
  - A few progress-challenged issues (not progressing much for several meetings) tend to be relatively self-contained and small in scope:
    - Enhancement for inter-cell multi-TRP, UL multi-panel, MPE mitigation
  - Resolution is expected in the remaining 3 meetings <u>assuming</u> no major roadblocks and high output efficiency from eMeetings
  - The last 3 RAN1 meetings are critical – caution should be exercised

Rel.17 FeMIMO: potential issues brought up in RAN1

- **Potential issue 1**: Potential overlap between multi-beam (#1a in WID) and inter-cell multi-TRP (#2b in WID) was brought up in, e.g. RAN1#105-e

- Both enhancement items include inter-cell beam management (beam measurement/reporting and beam indication)
  - Inter-cell beam measurement/reporting is common for both items – RAN1 already decided to complete this work in #1a
  - Inter-cell beam indication in #1a is based on Rel-17 unified TCI framework while in #2b on Rel-15/16 TCI framework, hence the two are not common
  - In addition, #2b "... assum(es) multi-DCI based multi-PDSCH reception" which is not the case for #1a → the two are not targeting the same use case

- **Conclusion**: The perceived overlap is essentially non-existent as the TCI frameworks and the target use cases are different
  - No action is needed

Rel.17 FeMIMO: potential issues brought up in RAN1

- **Potential issue 2**: Scope-related issues on L1/L2-centric inter-cell mobility per RAN2 response on the LS (#1a in WID)

- Detailed analysis from Samsung perspective is given in RP-211190

- RAN1 and RAN2 works, while related, are modular in functionality
  - No need to link the two – each can proceed in parallel especially after the LS reply
  - Both scenarios 1 and 2 in RAN2 are applicable for L1/L2-centric inter-cell mobility: *made clear in the LS reply R2-2106787*
- RAN1 work: inter-cell beam management based on Rel-17 unified TCI
  - Needed for both scenarios 1 and 2
- RAN2 work: the required work depends on the scenario
  - Scenario 1: assume legacy HO procedure, limited additional work
  - Scenario 2: potentially new L1/L2-triggered inter-cell RRM/mobility/HO procedure
  - RAN2 can decide whether to focus on only scenario 1, 2, or 1+2 for Rel-17
  - Due to very limited TU allocation, focusing on scenario 1 seems more feasible for Rel-17, thereby leaving scenario 2 for Rel-18

Rel.17 FeMIMO: proposals

- **Proposal**: On L1/L2-centric inter-cell mobility for NR_FeMIMO WI, RAN to conclude on the following:
  - Affirm RAN2 output in R2-2106787 that both scenarios 1 and 2 of R2-2106787 apply to L1/L2-centric inter-cell mobility
  - RAN1 to proceed work on inter-cell beam management (including inter-cell beam indication) in parallel to RAN2

Rel.17 FeMIMO: proposals

Based on the aforementioned reasoning, the following minor rewording in the [RAN1] part of the WID is **proposed** to improve clarity:

- To remove prevailing misunderstanding that RAN1 is tasked to work on inter-cell mobility/HO procedure
- To clarify that the work needed in RAN1 is simply inter-cell beam management
- To clarify that "higher ... mobility" in the previous version refers to UE speed (as evident in the agreed evaluation methodology) rather than hand-over procedure

1. Enhancement on multi-beam operation, mainly targeting FR2 while also applicable to FR1:
   a. Identify and specify features to facilitate more efficient (lower latency and overhead) DL/UL beam management for intra-cell and inter-cell (to facilitate L1/L2-centric inter-cell mobility) to support higher speed ~~intra- and L1/L2-centric inter-cell mobility~~ and/or a larger number of configured TCI states:
      i. Common beam for data and control transmission/reception for DL and UL, especially for intra-band CA
      ii. Unified TCI framework for DL and UL beam indication
      iii. Enhancement on signaling mechanisms for the above features to improve latency and efficiency with more usage of dynamic control signaling (as opposed to RRC)
   b. Identify and specify features to facilitate UL beam selection for UEs equipped with multiple panels, considering UL coverage loss mitigation due to MPE, based on UL beam indication with the unified TCI framework for UL fast panel selection