(NOTE: Track changes relative to v010\_Mod)

Based on the above observation the following moderator **proposals** are made:

* [Issue 1] For Rel.17 NR FeMIMO, on the unified TCI framework
	1. Support joint TCI for DL and UL based on and analogous to Rel.15/16 DL TCI framework
		+ The term “TCI” at least comprises a TCI state that includes at least one source RS to provide a reference (UE assumption) for determining QCL and/or spatial filter
		+ The source reference signal(s) in one TCI or >1 TCIs provide common QCL information at least for UE-dedicated reception on PDSCH and all CORESETs in a CC
		+ The source reference signal(s) in one TCI or >1 TCIs provide a reference for determining common UL TX spatial filter(s) at least for dynamic-grant/configured-grant based PUSCH, all dedicated PUCCH resources in a CC,
			- Optionally, this UL TX spatial filter can also apply to all SRS resources in resource set(s) configured for antenna switching/codebook-based/non-codebook-based UL transmissions
			- FFS: applicability of this UL TX spatial filter to SRS configured for beam management (BM)
			- FFS: PUSCH port determination based on the TCI, e.g., to be mapped with SRS ports analogous to Rel.15/16
		+ When used for the purpose of joint beam indication for UL and DL, joint TCI pool for DL and UL is used
		+ FFS (RAN1#103-e): Details on extension to intra- and inter-band CA
		+ FFS (RAN1#103-e): Extended use case of unified TCI framework beyond facilitating common beam updates
		+ FFS (RAN1#103-e): The supported number of active TCI states considering factors such as multi-TRP and issue 6.2
	2. In RAN1#103-e, investigate, for the purpose of down selection, the following alternatives for accommodating the case of separate beam indication for UL and DL
		+ Alt1. Utilize the joint TCI to include references for both DL and UL beams
		+ Alt2. Support/introduce a (new) UL TCI separate from the current (Rel.15/16) DL TCI
			- Alt2-1. TCIs for UL and DL are from a joint pool of TCI states
			- Alt2-2. TCIs for UL and DL are from separate pools of TCI states
		+ FFS (RAN1#103-e): Details on extension to intra- and inter-band CA
		+ Note: This may be related to issue 5 as well as other reasons for different TCIs such as network flexibility/scheduling
	3. Support the use of SSB/CSI-RS for BM and/or SRS for BM as source RS to determine a UL TX spatial filter in the unified TCI framework
		+ Whether the UL TX spatial filter corresponds to UL TCI (separate from DL TCI) depends on the outcome of 1b) above
	4. In RAN1#103-e, decide if SRS for BM can be configured as a source RS to represent a DL RX spatial filter in the unified TCI framework
	5. In RAN1#103-e, decide/finalize all other parameters included in or concurrent with (but not included in) the TCI, e.g. UL-PC-related parameters (involving P0/alpha, PL RS, and/or closed loop index), UL-timing-related parameters
	6. In RAN1#103-e, identify issues pertaining to alignment between DL and UL default beam assumptions using the unified TCI framework
* [Issue 2] For Rel.17 NR FeMIMO, on L1/L2-centric inter-cell mobility:
	1. In RAN1#103-e, finalize scope and use cases for L1/L2-centric inter-cell mobility, including:
		+ Applicability in various CA setups such as intra-band and inter-band CA
		+ Use cases in comparison to Rel.15 L3-based handover (HO) taking into account potential extension of DAPS-based Rel.16 mobility enhancement to FR2-FR2 HO
		+ The extent of RAN2 impact (MAC CE, RRC)
		+ Network architecture, e.g. NSA vs. SA, inter-RAT scenarios
	2. In RAN1#103-e, depending on the outcome of 2a), further identify additional components –along with the associated alternatives –required for supporting inter-cell mobility based on the same unified TCI framework as that for intra-cell mobility (including dynamic TCI state update signaling), including
		+ Method(s) for incorporating non-serving cell information associated with TCI
		+ Method(s) for DL measurements and UE reporting (e.g. L1-RSRP) associated with non-serving cell(s)
		+ UE behavior for reception of signals, control and data channels associated with non-serving cell(s)
		+ UL-related enhancements, e.g. related to RA procedure including TA
		+ Event-driven mechanism for L1/L2-centric inter-cell mobility
* [Issue 3] For Rel.17 NR FeMIMO, on dynamic TCI state update signaling medium:
	1. In RAN1#103-e, investigate, for the purpose of down selection, the following alternatives:
		+ Alt1. DCI
		+ Alt2. MAC CE
		+ Note: Combination between DCI and MAC CE for, e.g. different use cases or control information partitioning can also be considered
		+ Note: The study should consider factors such as feasibility for pertinent use cases, performance (based on at least the agreed EVM), overhead, latency, reliability including the support of retransmission
		+ Note: This may be related to outcome of issue 1a), 1b), and 6a)
	2. In RAN1#103-e, depending on the outcome of 3a), identify candidates for more detailed design issues for the dynamic TCI state update such as
		+ Exact content
		+ Signaling format, including the support of UE-group (in contrast to UE-dedicated) signaling
		+ Reliability aspects including the support of retransmission
* [Issue 4] For Rel.17 NR FeMIMO, on MP-UE assumption to facilitate fast UL panel selection:
	1. The following assumptions are used:
		+ In terms of RF functionality, a UE panel comprises a collection of TXRUs that is able to generate one analog beam (one beam may correspond to two antenna ports if dual-polarized array is used)
		+ UE panels can constitute the same as well as different number of antenna ports and EIRP
		+ For each UE panel, it can comprise an independent unit of PC and/or TA.
		+ No beam correspondence across different UE panels
		+ Same or different sets of UE panels can be used for DL reception and UL transmission, respectively
	2. In RAN1#103-e, identify candidate use cases including MPE, and consider remaining aspects if use cases are identified
	3. In RAN1#103-e, identify candidate signaling schemes for the following:
		+ NW to MP-UE (taking into account potential extension of the unified TCI framework in issue 1)
		+ MP-UE to NW
* [Issue 5] For Rel.17 NR FeMIMO, on MPE mitigation (that is, minimizing the UL coverage loss due to the UE having to meet the MPE regulation), in RAN1#103-e:
	1. If needed, identify candidate solutions to be down-selected in future meeting(s). The following sub-categories can be used:
		+ CAT0. The need for specification support for MPE event detection and, if needed, candidate solutions
		+ CAT1. The need for UE reporting associated with an MPE and/or a potential/anticipated MPE event if the UE selects a certain UL spatial resource, e.g., corresponding to DL or UL RS
		+ CAT2. The need for NW signaling in response to the reported MPE event (taking into account issue 1) and UE behavior after receiving the NW signaling
		+ Note: RAN4 has agreed to specify P-MPR reporting (cf. CRs for TS 38.101/102/133) which can be used as a baseline scheme for further enhancement
		+ Note: This may be related to outcome of issue 4b)
	2. Companies are encouraged to submit evaluation results based on the agreed EVM to justify the benefits of the candidate solutions
* [Issue 6] For Rel.17 NR FeMIMO,
	1. Add another category for beam acquisition (including beam tracking and refinement) latency reduction –especially in high-speed scenarios – which includes performing study and, if needed, specifying at least the following [further sub-categorization is to be done in RAN1#102-e to facilitate more structured discussion in RAN1#103-e]:
		+ Joint DL TX/RX beam refinement (P2/P3) and beam sweeping using ‘UE-group TCI’
			- Note: The relation with existing features such as beam-group reporting should be considered
		+ Joint DL TX/RX beam refinement (P2/P3) and beam sweeping by using CSI-RS resources with partial repetition within a CSI-RS resource set across DL spatial domain TX filters.
		+ Joint UL TX/DL RX beam refinement (joint P2/U3) based on CSI-RS with repetition across DL spatial domain TX filters and aperiodic SRS transmission
		+ Predictive TCI state update (including potential MPE event indication)
		+ Enabling DL TX/RX beam refinement (P2/P3) via additional QCL with A-TRS
		+ SSB-based beam indication to facilitate beam refinement and selection, e.g. via MSG3 on PRACH during initial access
		+ Dynamic TCI for periodic and/or aperiodic RS
		+ Intra-symbol beam sweeping based on 1-port CSI-RS for BM
		+ Dynamic TCI state/QCL source update directly from L1-RSRP measurement report with gNB control/confirmation
		+ Simultaneous PL RS update across CCs
		+ Simultaneous spatial relation update for multiple SRS resource sets
	2. Partial BFR will be handled in ITEM 2c (BM enhancement for mTRP)