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Motivation for New WID: Enhancements to LTE operation in unlicensed spectrum

Nokia, Ericsson

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Rel. 15 Enhancements to LTE operation in unlicensed spectrum
Background

- In LTE Rel. 13, 3GPP specified ‘Licensed-Assisted Access’ to facilitate DL-only Carrier aggregation with SCells on 5 GHz unlicensed spectrum
- Rel-14 eLAA added support for PUSCH and SRS transmissions on LAA Scells

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Stand-alone operation

- To allow for more deployment scenarios for LTE, and to better support existing scenarios, for example indoor deployments that utilize unlicensed spectrum, it is important to extend the operation of LTE to support standalone connectivity in unlicensed spectrum.
- Standalone operation allows for a node to operate fully independently in unlicensed spectrum, and is an enabler for e.g. Neutral host deployments and Venue specific radio networks

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eLAA Enhancements

- Further enhancements to (e)LAA operation help in improving performance and efficiency of the channel utilization
- Autonomous uplink operation provides significant performance benefits for operation in unlicensed spectrum
- Multiple starting and ending positions in a subframe for PUSCH allows for optimized channel utilization in case of e.g. small packet transmissions

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Objectives

- **Specify support for multiple starting and ending positions in a subframe for UL on SCell with Frame structure type 3. [RAN1, RAN2, RAN4]**
- **Study, and specify if needed, support for autonomous uplink access with Frame Structure type 3 considering solutions from the L2 latency reduction work item [RAN1, RAN2, RAN4]**
- **Support standalone operation of LTE in unlicensed spectrum with Frame Structure type 3 [RAN1, RAN2, RAN4], including**
  - PRACH transmission [RAN1, RAN2, RAN4]
  - Efficient transmission of system information, paging and quick identification of service providers during cell acquisition [RAN1, RAN2, RAN4]
  - RRM measurements (PCell) [RAN1, RAN2, RAN4]
  - Necessary layer 1 control information, including PUCCH, uplink control information transmission on PUSCH, and necessary enhancements to downlink control information [RAN1, RAN2, RAN4]
  - Support for RRC_IDLE and RLM/RLF [RAN2, RAN4]
  - Carrier aggregation support between carriers operating only in unlicensed spectrum [RAN4, RAN1, RAN2]
- **The work item should also specify base station and UE core requirements to support the above features [RAN4]**

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