3GPP TSG-RAN WG3 Meeting #122 R3-237937

**Chicago, USA, 13th – 17th Nov 2023**

**Agenda item: 10.2.2**

**Source: Samsung, Nokia, Nokia Shanghai Bell**

**Title:** **(TP for SON BLCR for 37.340) SON enhancements for CPAC**

**Document for: Discussion and Decision**

# **1 Introduction**

This contribution provided a TP on MRO CPAC for TS37.340..

# **TP for TS37.340**

10.18.1 General

For analysis of PSCell change failure, the UE makes the SCG Failure Information available to the MN.

10.18.2 PSCell change failure

One of the functions of self-optimization for PSCell change is to detect PSCell change failures that occur due to Too late PSCell change or Too early PSCell change, or Triggering PSCell change to wrong PSCell. These problems are defined as follows:

- Too late PSCell change: an SCG failure occurs after the UE has stayed for a long period of time in the PSCell; a suitable different PSCell is found based on the measurements reported from the UE.

- Too early PSCell change: an SCG failure occurs shortly after a successful PSCell change from a source PSCell to a target PSCell or a PSCell change failure occurs during the PSCell change procedure; source PSCell is still the suitable PSCell based on the measurements reported from the UE.

- Triggering PSCell change to wrong PSCell: an SCG failure occurs shortly after a successful PSCell change from a source PSCell to a target PSCell or a PSCell change failure occurs during the PSCell change procedure; a suitable PSCell different with source PSCell or target PSCell is found based on the measurements reported from the UE.

In the definition above, the "successful PSCell change" refers to the UE state, namely the successful completion of the RA procedure.

MN performs initial analysis to identify the node that caused the failure. The MN may use the SCG Failure Information Report procedure to verify whether intra-SN PSCell change has been triggered in the last serving SN and stores the SCG Failure Information for the time needed to receive possible response from the last serving SN. If the failure is caused by a source SN, the MN forwards then the SCG Failure Information to the source SN. The node responsible for the last PSCell change (the source SN, the last serving SN or the MN) performs the final root cause analysis.

10.18.A Conditional PSCell addition or change failure

One of the functions of self-optimization for CPAC is to detect CPAC failures that occur due to Too late CPC execution or Too early CPC/CPA execution, or CPC/CPA execution to wrong PSCell. These problems are defined as follows:

- Too Late CPC Execution: UE receives CPC configuration, while a SCG failure occurs before CPC execution condition is satisfied; a suitable PSCell different from source PSCell is found based on the measurements reported from the UE.

- Too Early CPC/CPA Execution: CPC/CPA execution is not successful or an SCG failure occurs shortly after a successful CPC/CPA execution; in case of CPC, the source PSCell is still the suitable PSCell based on the measurements reported from the UE; in case of CPA, no suitable PSCell is found based on the measurements reported from the UE.

- CPC/CPA Execution to wrong PSCell: CPC/CPA execution is not successful or an SCG failure occurs shortly after a successful CPC/CPA execution; a suitable PSCell different from the source PSCell or the target PSCell is found based on the measurements reported from the UE. There are two sub-cases:

- if the suitable PSCell is one of the candidate target PSCells provided by the node initiating the CPC or by the MN initiating the CPA to, but not one of the candidate PSCells selected by the candidate or target SN, it is wrong target PSCell selection at the candidate or target SN;

- else, it is wrong candidate PSCell list selection at the node initiating the CPC or at the MN initiating the CPA.

In the definition above, the "successful CPC/CPA execution" refers to the UE state, namely the successful completion of the RA procedure.

The MN performs the initial analysis when *SCGFailureInformation* is received from the UE. In the first step, MN verifies whether intra-SN PSCell change has been triggered in the last serving SN. In case the intra-SN PSCell change has been triggered in the last serving SN, the MN forwards the SCG Failure Information Report message to this last serving SN, which performs the final root cause analysis. In case of no intra-SN PSCell change, the MN determines the type of PSCell addition/change, e.g., whether it is CPA or CPC in case of conditional mobility, if CPC whether it is MN initiated or SN initiated.

For CPA or MN initiated CPC, if the suitable PSCell is one of the candidate PSCells provided by the MN at CPAC preparation, but not one of the candidate PSCells selected by the candidate or target SN, MN sends the SCG Failure Information Report message to the candidate or target SN, which perform the final MRO related optimisation . Otherwise, the MN performs the final MRO related optimisation.

For SN initiated CPC, the MN sends the SCG Failure Information Report message to source SN, and source SN performs root cause analysis. If the suitable PSCell is one of the candidate PSCells provided by the source SN, but not one of the candidate PSCells selected by the candidate or target SN, the source SN indicates to MN that the root cause of the SCG failure may have occurred in the other nodes. MN then sends the SCG Failure Information Report message to the candidate or target SN. Otherwise, the source SN performs the final MRO related optimisation.