3GPP TSG-SA WG4 Meeting #131-bis-e *S4-251116*

Online, 11 – 17 April 2025

**Source: Fraunhofer IIS**

**Title: Template for ULBC design constraints**

**Spec: 3GPP TS 26.940**

**Agenda item: 7.9**

**Document for: Agreement**

**1. Introduction**

At the SA4 meeting #131-bis-e, [S4-250749](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250749.zip) has been agreed as TR 26.940 V0.1.0. This document contains clause 6 “Design Constraints” which currently only lists Editor’s notes. According to the ULBC time plan in [S4-250751](https://www.3gpp.org/ftp/tsg_sa/WG4_CODEC/TSGS4_131-bis-e/Docs/S4-250751.zip), the work on design constraints should start at SA4 meeting #132.

Therefore, the present document proposes a template for documenting the design constraints.

**2. Reason for Change**

Provide initial template for Design Constraints of ULBC

**3. Proposal**

TR 26.940 V0.1.0 currently lists the following design constraints in the Editor’s note:

Bit rates

- Sample rate and audio bandwidth

- Frame length

- Complexity and memory demands

- Algorithmic delay

- Packet loss concealment (PLC)

- Potential use of noise suppression as part of the codec

- Discontinuous transmission including voice activity detection and comfort noise

- Speech quality

- Robustness to non-speech input

It is proposed to take all design constraints in the initial template, except “Speech quality”. As this topic is more related to performance requirements, an Editor’s note is proposed to capture this. Depending on further discussion, “Robustness to non-speech input” might also be related to performance requirements.

It is proposed to agree the following changes to 3GPP TS 26.940 V0.1.0

\* \* \* First Change \* \* \* \*

# 6 Design Constraints

## 6.1 General

The following clauses present the design constraints (DC) for an Ultra Low Bitrate Codec for the use in application scenarios as given in clause 4. Clause 6.2 outlines the DC parameter and clause 6.3 outlines objective verification methods of some DC parameter.

## 6.2 Design Constraint Parameter

Table 6.2-1 List of ULBC design constraint parameter

| Parameter | Design Constraint | Note |
| --- | --- | --- |
| Bit rates |  |  |
| Sample rate and audio bandwidth |  |  |
| Frame length |  |  |
| Complexity and memory demands |  |  |
| Algorithmic delay |  | The algorithmic delay is defined as the frame size buffering delay plus any other delays inherent in the codec algorithm (e.g., look-ahead, sample-rate conversion, and decoder post-processing) |
| Packet loss concealment (PLC) |  |  |
| Potential use of noise suppression as part of the codec |  |  |
| Discontinuous transmission including voice activity detection and comfort noise |  |  |
| Robustness to non-speech input |  | Editor’s note: May need to be in performance requirement |
|  |  |  |

Editor’s note: Speech quality to be addressed in the performance requirements.

## 6.2 Design Constraint Verification

Editor’s note: Algorithmic delay verification method for AI based codecs required.

\* \* \* End of Changes \* \* \* \*