**VCEG-BT09**

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| **Question(s):** | 6/16 | | **Meeting, date:** | Hannover, 16-19 October 2023 | |
| **Study Group:** | **16** | **Working Party:** | 3 | | |
| **Source:** | Rapporteur Q6/16 | | | | |
| **Title:** | LS/r on selecting a DICOM biomedical waveform codec | | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | DICOM WG32 (Neurophysiology Data) | | | |
| **For information to:** | | – | | | |
| **Agreement:** | | ITU-T Q6/16 meeting (Hannover, 19 October 2023) | | | |
| **Deadline:** | | 17 January 2024 | | | |
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| **Abstract:** | This document is a liaison statement from ITU-T Q6/16 to DICOM WG32 (Neurophysiology Data). It follows up on a prior reply to a liaison statement discussing the availability and possible development of a waveform codec suitable for compressing biomedical data and use in DICOM systems. It reports on further work that has been conducted by Q6/16 on the identification of a benchmark technology and on the issuance of a Call for Evidence for the compression of biomedical waveform data issued by ITU-T Q6/16. |

Question 6 of ITU-T Study Group 16 (known as VCEG) again thanks DICOM WG32 (Neurophysiology Data) for its liaison statement regarding the possible development of a waveform codec suitable for compressing biomedical waveform data (your [[DICOM-WG32-LS20221107](https://www.itu.int/ifa/t/2022/ls/dicom/sp17-dicom-iLS-00001.docx)](https://www.itu.int/ifa/t/2022/ls/isoiecjtc1sc29wg1/sp17-iso_iecjtc1_sc29_wg1-iLS-00050.pdf), our [SG16-TD103/Gen](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG16-230710-TD-GEN-0103)). Following our prior reply from the meeting of ITU-T SG16 in July 2023, we have conducted further study and held additional discussions to identify suitable benchmark technologies and have issued a Call for Evidence.

Regarding the identification of a suitable benchmark technology for the development of new waveform codec, our Ad hoc Group (AhG) on the coding of medical and general waveform data has studied existing reference codecs that could be suitable for compressing biomedical waveform data.

The state-of-the-art audio codec MPEG-D Extended HE-AAC with an MSE-optimized encoding has been identified as a suitable benchmark for lossy compression of the biomedical waveform data provided by your organization. The results of this benchmarking effort are attached as document **VCEG-BT05** to this liaison statement.

The experiments presented in VCEG-BT05 were discussed in Q6/16 and in a joint meeting with ISO/IEC JTC 1/SC 29/WG 6 MPEG Audio Coding, the organization that standardized MPEG-D Extended HE-AAC. Experts have generally commented that the AhG’s method of operating MPEG-D Extended HE-AAC to generate the reported compression results can provide a suitable anchor for the performance benchmarking. Some suggestions have also been made for potential further investigations regarding the use of MPEG-4 SLS and the use of MPEG-D Extended HE-AAC with short block length.

Following these discussions, Q6/16 has thus issued a Call for Evidence (CfE) on the compression of biomedical waveform data. Respondents to the CfE are requested to submit responses for consideration at the Q6/16 teleconference meeting of 22–26 January 2024. These responses shall include a description of the proposed compression technologies and experimental results on compression experiments for the three datasets containing Electroencephalography (EEG), Electrocardiography (ECG) and Electromyography (EMG) signals provided by your organization. Following the identification of such evidence with compression performance that can significantly outperform the benchmark technology, Q6/16 aims to rapidly progress to a Call for Proposals and to start the formal development of a new waveform coding standard. This is expected to include capabilities for both lossless and near-lossless compression, as these goals cannot be achieved with the MPEG-D Extended HE-AAC benchmark technology. The issued Call for Evidence is attached as document **VCEG-BT07** to this liaison letter.

VCEG would very much welcome your feedback and future collaboration in the design of a coding standard for the compression of biomedical waveform data. This applies in particular to your assessment of proposed technology with respect to its suitability for the targeted medical applications and its integration into the DICOM framework.

Attachments:

[VCEG-BT05](https://www.itu.int/wftp3/av-arch/video-site/2310_Han/VCEG-BT05-v1.docx) *Information on performance evaluation of audio codecs for 2-channel ECG data*

[VCEG-BT07](https://www.itu.int/wftp3/av-arch/video-site/2310_Han/VCEG-BT07-v1.docx) (Annex B of the Q6/16 October 2023 meeting report) *Call for Evidence on the coding of biomedical waveform data*

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