|  |  |
| --- | --- |
| U.S. Radiocommunications Sector  Fact Sheet | |
| **Working Party:** ITU-R WP5B | **Document No:** USWP5B25-FD-12 |
| **Ref:** Rec. ITU-R M.489-2 | **Date:** 18 September 2020 |
| Document Title: Proposed corrigendum to Recommendation ITU-R M.489-2 | |
| **Author(s)/Contributors(s):**  Joe Hersey  JOECEL Engineering  Ross Norsworthy  REC Inc  Jerry Ulcek  US Coast Guard | **Email**: joe@joecel.com **Phone**: (301) 512-9860  **Email**: ross\_norsworthy@msn.com **Phone**: (757) 515-8025  **Email**: jerry.l.ulcek@uscg.mil **Phone**: (202) 475-3551 |
| **Purpose/Objective:** Clarify and correct what has become by some a misunderstanding in the difference between signal and noise plus distortion ratio (SINAD) and signal-to-noise ratio in the measurement of receiver performance. | |
| **Abstract:** Rec. ITU-R M.489-2 ﻿*Technical characteristics of VHF radiotelephone*  *equipment operating in the maritime mobile service in channels spaced by 25 kHz* requirement for receiver sensitivity “for a given reference signal-to-noise ratio at the output of the receiver” has long been properly understood to mean a SINAD measurement, and is rightly interpreted that way by applicable test standards. Yet over time some have misinterpreted that understanding and a clarification may now be warranted. The clarification might be simply accomplished editorially or by corrigendum. | |

|  |  |
| --- | --- |
| **Radiocommunication Study Groups** |  |
|  |  |
|  |  |
| Source: Rec. ITU-R M.489-2, ﻿IMO/ITU EG 16/WP.1/Add.4, Rec. ITU-R M.1808-1  Subject: VHF maritime radiotelephone SINAD Vs SNR | **Document 5B/-E** |
| ***[18 September 2020]*** |
| **English only** |
| **United States of America** | |
| Proposed corrigendum to Recommendation ITU-R M.489-2   1. **Introduction**   Recommendation ITU-R M.489-2 ﻿*Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz* requirement for receiver sensitivity “for a given reference signal-to-noise ratio at the output of the receiver” (§1.3.1), last updated in 1995, has long been properly understood to mean a SINAD measurement, and is rightly interpreted that way by applicable test standards[[1]](#footnote-1). Yet over time some have misinterpreted that understanding and a clarification may now be warranted, particularly when in developing electromagnetic compatibility (EMC) protection standards based upon this performance criteria. The clarification might be simply accomplished editorially or by corrigendum.   1. **Background**   *﻿*Recommendation ITU-R M.1808-1 *Technical and operational characteristics of conventional and trunked land mobile systems operating in the mobile service allocations below 869 MHz to be used in sharing studies in bands below 960 MHz* notes that conventional land mobile analogue systems are designed to meet performance criteria usually expressed by SINAD. “SINAD is the ratio of signal+noise+distortion divided by noise+distortion, expressed in dB. It is measured at the receiver audio output and provides a quantitative measurement of the quality of an audio signal. Report ITU-R M.358-5 suggests that a SINAD ratio of 12 dB is convenient for establishing degradation protection for land mobile systems but SINAD values between 12 and 20 dB are often used when designing these systems.”[[2]](#footnote-2) IMO specifies 20 dB for this value for VHF maritime radiotelephone systems used in the GMDSS[[3]](#footnote-3) since that system is used for distress and safety purposes.   1. **Proposal**   It is proposed that §1.3.1 be amended or footnoted in such a way as to clarify the text without in any way changing its originally intended meaning, e.g.:  ﻿1.3 Receivers  1.3.1 The reference sensitivity should be equal to or less than 2.0 µV, e.m.f., for a given reference signal-to-noise-and distortion (SINAD) ratio at the output of the receiver. | |

1. See for example ﻿IEC 61097-7, paragraph 5.5.3.1, and IEC 61097-3, paragraph 4.2.5.1.4, for GMDSS VHF

   radiotelephone. [↑](#footnote-ref-1)
2. Rec. ITU-R M.1808-1 §2.3 [↑](#footnote-ref-2)
3. IMO ﻿Resolution A.803(19) on Performance Standards for Shipborne VHF Radio Installations Capable of Voice

   Communication and Digital Selective Calling. IMO/ITU EG16 agreed to a similar clarification in this performance standard in EG 16/WP.1/Add.4 [↑](#footnote-ref-3)