To: Australian Human Rights Commission.

Attn: Prof. Gillian Triggs (President -AHRC)

Hon. Susan Ryan  (Commissioner - A&DD)

Dear Madam,

Although I have affiliations with several Rail and Disability organisations, I am writing this Submission as a congenitally deaf individual, to comment the Application for Standards Exemptions by the Australasian Rail Association.

There are a number of issues`that need to be reviewed with comments, as the Transport Industry has been seeking repeated (5-yearly) temporary Exemptions since 2002.

Previous HREOC (or Australian Human Rights Commission) Inquiries have noted that Access to new Communication Technology is more rapid that Mobility Access upgrades via new conveyances and refurbished premises.  I may choose to provide further Submissions on other areas of the ARA Application later.

In this Submission, I will comment comprehensively on the ARA Exemption request for Section 26.2(b), which applies to conveyances not premises, and states.

Section 26

*26.2 Hearing augmentation – listening systems - Public address systems — conveyances*

*If a public address system is installed:*

*(a)             people who are deaf or have a hearing impairment must be able to receive a message equivalent to the message received by people without a hearing impairment; and*

*(b)             it must comply with AS1428.2 (1992) Clause 21.1, Hearing augmentation.*

At this point, may I first acknowledge the fine contribution made by then Disability Commissioner, Graeme Innes in his DDA Complaint against NSW Railcorp; hence confirming as follows;

a) For a legally blind person, a visual Noticeboard or electronic Display is not equivalent to an auditory Public Address announcement.

b) For a profound Deaf person (including Auslan signers), a Public Address announcement is not equivalent to an Electronic Display!

Hence there is a need to steadily improve all communication modes and not rely on one option to be a replacement for another.

**Reasons not to grant a further temporary Exemption from Section 26.2(b) and to revamp Section 26(1) of the**

AS1428.2 (1992) is a very old Standard (Part 2: Enhance & additional requirements in buildings and facilities) and Clause 21.1 (General) states that "a listening system to aid hearing impaired people shall be installed ...... and shall cover at least 10 percent of the total area of the enclosed space (where the sound amplification [PA] system is provided). It is usually impossible for people using hearing aids to find such a small area, making a joke of the signage and claims that Hearing Augmentation exists on some concourses. It is therefore necessary for new or upgraded Standards to be referenced by the Disability Standards for Accessible Public Transport 2002.

The Clauses in AS1428.2 (1992) was written at a time when Hearing Augmentation was a concept in its infancy. Time has shown that the Audio Frequency Induction Loop system (AFILS) is a preferred transport option because headsets are not required.  Also the measurement of speech intelligibility was in its infancy and it was horrendously expensive to test in 1992, either with scientific equipment (such as a RASTI meter at $25,000) or by reading word lists and sentences to an audience.  Today better intelligibility test equipment costs $7,000. AFILS are a problem solver but since they are Analog technology in a digital environment, engineers and consultants do not understand how to install AFILS or how they better perform compared with Public Address systems.

Hearing augmentation systems do offer a better sound quality, where the Common Intelligibility Scale (CIS) is usually 0.95 or better.

The best possible speech intelligibility (CIS) in an open Rail concourse or platform is usually around 0.87. Better performance is possible if a very special listening area is created.

Examples of superior listening areas are smaller cinemas and the NSW Parliament theatrette, where the intelligibility (CIS)  varies between 0.86 to 0.94, when the PA sound system is working , Measurements depend on the location of your seat. On the other hand Olympic Park Railway platforms have a CIS around 0.78; while the Olympic Park Concourse above the platforms have a CIS of 0.6.

Generally speaking, the CIS values increase as a person gets closer to a loud speaker. The US Access Board received recommendations that where Hearing Augmentation is required, the Speech Transmission Index should be at least 0.84. This is equivalent to a Common Intelligibility Scale equal to 0.92.  As can be seen by these examples, it is a tough job to reach a CIS of 0.92 on an open concourse, though good intelligibility is easier to achieve in a closed conveyance.  Hence Hearing Augmentation is required from the Transportation Industry in most cases; hearing aid uses appreciate  AFILS on passenger conveyances and carriages because you are sitting in a "waiting" zone and able to use the T-switch.

So it is necessary for the Rail Industry to install Hearing Augmentation using upgraded Standards!  AS1428.5 (Part 5: Communication for people who are deaf or Hearing Impaired) recommends in Section 3.6 that  "an Assistive Listening System (ALS) to aid hearing-impaired people shall be installed or made available to a minimum of 50% of the conveyance".  Part D3.7 of the Disability Premises Standards states that where required, "an induction loop must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system". The Transport for NSW - Asset Standards Authority (ASA) have issued a Draft Technical Note TN029: 2015 "Audio Frequency Induction Loop Systems for Public Address in Public Transport Building" where AS1428.5 is referenced by ASA.

AS1428.5 is the Standard that should be improved, then referenced by all Transport & Disability Standards, across Australia.

The ASA Technical Note TN029 (2015 draft) is a collection of the good and the bad.

The best part of TN029 is in incorporating audio announcements with a Wayfinding Guide. In particular it applies the Zone concept re: Information, Waiting, Boarding, Circulation, Entry (Identification), Portal and Facilities (Toilets).  In this situation, the basic principles of good speech intelligibility and Hearing augmentation should apply appropriately.

The worse of TN029 (2015) is that it cherry picks Sections of AS1428.5 (2010) and then reverts to AS1428.2 (1992) Clause 21.1 for a silly "safety margin" of 10% coverage.

This use of Clause 21.1 is made worse by the Temporary Exemption from the Transport Standards for Clause 26.2, regarding Rail conveyances because the Exemption is unnecessary, even for conveyances!  There are many trams (light rail) and electric traction rail carriages that have successfully installed Assistive Listening  systems, including the latest Sydney Trains (Waratah, etc) and Queensland's Tilt trains.

In 2001, then Queensland Railways (with ADtranz) issued a Technical Document titled "QR SMU220 Hearing Aid Induction Loop Test Report". This Report incorporated Aust. Hearing Services  Report No. 41040156 titled "Test Report on Hearing Aid Induction in Railway Carriages". In this Report, the researcher uses a Rastronic FST-70 Magnetic Field Strength Meter with a flat frequency response between  100 Hz and 10 kHz. The low-pole filtering on each edge provided a 6 dB/Octave roll-off.  For example, a 24 dB burst of electro-magnetic energy at 20 kHz would be recorded as 12 dB on the meter read-out.

Diagrams show that these energy emissions on DMA and T cars returned measured Rastronic values that dropped from +24 dB to -12 dB along half the length of the carriage.  This indicated a point source for the electro-magnetic energy that may have been inaudible! (Note: Audible Loops are required to operate at +12 dB at 1 Khz). This early research seems to be an error that has guided 26.2(b) exemptions ever since.

It is better to let a group of hearing-aid wearers listen to AFILS in new conveyances and if necessary, confirms their comments by a test with a word-score. The simple idea of requiring a signal-to-noise ratio (S/N) of 15 dB for speech intelligibility has not informed the Transport Industry that reverberation does the main damage to speech intelligibility; and other types of noise are less likely to interfere!

Note that a rumbling train-at-speed interferes with everyone's hearing?

AFILS do not pick up reverberation!  Intermittent electromagnetic noise, such as from regenerative braking, can be heard by hearing-aid wearers on T-switch; but this does not seem to interfere with speech intelligibility over the whole journey.

If on a case-by-case basis, the ARA is claiming an Exemption, they should make their data publicly and openly available for scrutiny.

In an area requiring expertise, it is not satisfactory for the ARA to occasionally meet with the Australian Federation of Disability Organisations (AFDO), because AFDO members do not understand the technical arguments.

I heard an excellent AFILS or Hearing Augmentation at Olympic Park Station and more recently new NSW stations at Leppington and Edmondson Park. AFILS have been installed at Scofields stations but is not operational. When I made inquiries, Transport for NSW informed me that they had been switched off.  Olympic Park is now switch off.

For example, Deafness Access signs are located around Melbourne metropolitan stations and Southern Cross station, yet members of Better Hearing Aust will tell you that there is no Hearing Augmentation in these places? Common sense suggests that the ARA will gain more accurate data, if they let hearing-impaired people use the available Hearing Augmentation.

In 2010, Public Transport Victoria (via the Dept of Transport Generic Station ICT Spec.) had advised AFILS installers to build Loops to a dimension "typically up to 4m x 8m".

Now in 2015, the NSW ASA is planning to direct Construction Alliances to build AFILS on platforms and concourses to a dimension of 10 sq. metres. These dimensions are too small for an effective Induction Loop and clearly a bad idea has crossed State borders!  Sadly even good engineers do not design well, if they have not experienced the performance of Induction Loops!

The Sydney Airport Corporation (with Umow Lai and Phillip Chun Assoc as Project Managers) are currently installing Hearing Augmentation (AFILS) across large areas greater than 10% of the Sydney International Air Terminal.  They have decided to apply an improved design rule to ensure that the Induction Loop conductor or cable "shall be separated by at least 300 mm from any structural building metal capable of creating a pathway for an induced current".  This opposes the Induction Loop current and degrades the audio signal reaching hearing aids. The concept of separating the Loop conductor from other electrical conductive pathways found in the building fabric, is information that should be added to the ASA Draft TN029 (2015) document and should be put into a revised AS1428.5 Standard.

There is much that can be added in regard to this ARA Application and requiring further Inquiry.

However, may I end my Submission by attaching a short video demonstrating Hearing Augmentation at Olympic Park Station, for your information!

This video camera used an inexpensive Induction pickup (from Dick Smith Electronics) as the AFILS input, yet the speech quality can be heard to be better than the equivalent PA system.

Sincerely,

Peter Kerley