



SUBMISSION

Captioning Review

**Inquiry into the Broadcasting and Other Legislation
Amendment (Deregulation) Bill 2014**

10 DECEMBER 2014

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Background

Ai-Media is an independent for profit social enterprise, dedicated to improving access with accurate speech-to-text (captioning) services and related analytics.

We serve clients in the broadcast, education, corporate and government sectors, predominantly in Australia and the UK.

Our Australian broadcast clients include Foxtel, Nine Network Australia, Fox Sports Australia, Australian News Channel (Sky News), BBC Worldwide Australia, Discovery Networks Asia-Pacific and NBC Universal.

We provide both live and offline (pre-recorded) captioning using a team of over 100 trained broadcast captioners (offline, live Stenocaptioners, live respeakers).

Our robust quality assurance systems are benchmarked to international best practice with regular end-to-end internal audits. Our live quality outcomes for Nine Network Australia are supported by a quarterly external audit, with results published on our website.

Ai-Media acknowledges the support of the Australian Government through the Commercialisation Australia program to develop our education and online captioning product, Ai-Live, and our independent evaluation partner, the University of Melbourne.

Ai-Media thanks the Senate Environment and Communications Legislation Committee ("the Committee") for the opportunity to comment on the proposed changes to the captioning regulations through the *Broadcasting and Other Legislation Amendment (Deregulation) Bill 2014* ("the Bill"), as presented to the House of Representatives on 22 October 2014.

Executive Summary

Ai-Media supports the continuing evolution of laws governing the delivery of captioning services on television with a view to providing the best access for viewers within sustainable commercial parameters, while minimising the regulatory and compliance burden for broadcasters, in an environment of rapid technological change.

We see a pressing need for clarity in legislation that is confusing and, at times, inconsistent.

Resolving this inconsistency is critical to consumer education – particularly with respect to the inherent trade-offs in live captioning, that make it very different to pre-recorded captioning.

We make following comments on the Bill, which include suggestions for further reform:

Captioning Quality

1. De-couple captioning quality from captioning quotas
2. Measure compliance on captioning quality over a period of time
3. Clearly articulate different quality expectations for live vs pre-recorded captioning; the quality of live captioning will always be lower than pre-recorded captioning
4. ACMA should take into account NER, or an alternative industry standard, when measuring captioning quality



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Captioning Quotas

5. Scrap the repeat rule for subscription broadcasters – quotas are cleaner
6. Sports channels should be able to aggregate their quotas where the channels are programmed as a suite
7. Simplify and make reporting more meaningful, timely and transparent for consumers
8. Avoid additional red-tape of “technical or engineering” issues by setting an acceptable benchmark of lost time in the context of 100% captioning quotas

Detailed Recommendations

Captioning Quality

1. De-couple captioning quality from captioning quotas

Section 5 of the Broadcasting Services (Television Captioning) Standard 2013 (“Captioning Quality Standard”) under subsection 130ZZA(1) of the Broadcasting Services Act 1992 states

5 Quality of captioning services

Broadcasters and narrowcasters must, when providing a captioning service in accordance with their captioning obligations, comply with the requirements relating to quality in this Standard.

Note: In exercising its enforcement powers under the Act, the ACMA takes the position that a program that does not meet the requirements of section 5 of this Standard will not be eligible to be used by a broadcaster or narrowcaster to comply with its captioning obligations.

Ai-Media submits that (1) providing a captioning service on a program is a distinct concept from, and should not be conflated with, (2) the quality of the captioning service on a program.

2. Measure compliance on captioning quality over a period of time

While Ai-Media fully supports minimum captioning quality standards, there will inevitably be greater variation in the quality of live captioning on programs than errors that cause the absence of captioning altogether.

As such, a “strict liability” system applied to quality outcomes for individual programs is inappropriate.

The ACMA should, when assessing captioning quality, consider:

1. evidence of the overall quality of the captioning service; and
2. evidence of a commitment to systemic and continual improvements to captioning quality

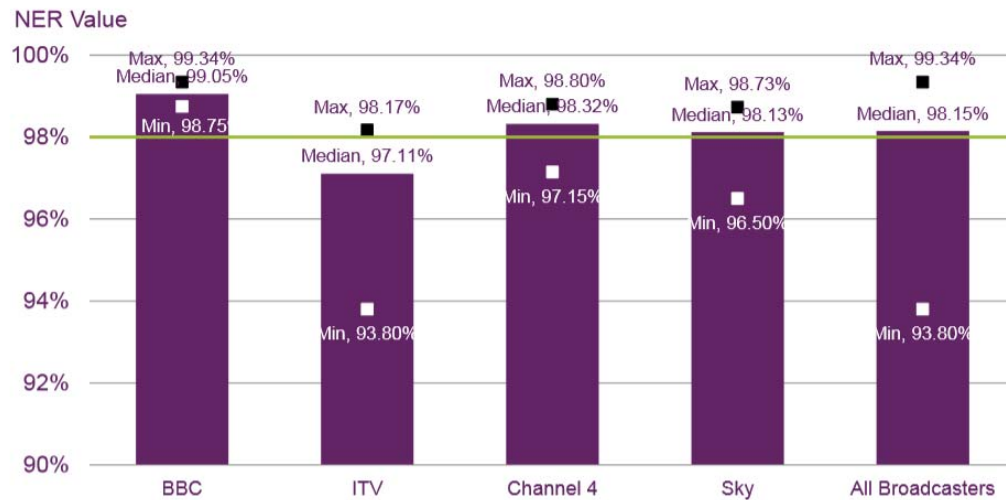
Producing isolated examples of captioning errors will always be possible, and does not provide a qualitative or quantitative method of determining adherence to minimum quality benchmarks.



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For example, Ofcom (the UK telecommunications regulator) reports minimum, maximum, and median scores over a sample period. The following graph is taken from Ofcom's quality sampling report 2014, page 8:¹

Figure 2: accuracy rates in samples drawn from chat shows
(higher bars represent a better viewing experience)



3. Clearly articulate different quality expectations for live vs pre-recorded captioning; the quality of live captioning will always be lower than pre-recorded captioning

Ai-Media has long argued for separate standards for live and pre-recorded captioning.

Recent guidance from the UK goes further still, with Ofcom noting systemic quality differences and large disparities between different *genres* of live programming (with the quality of news being higher than chat shows).²

Our January 2013 submission to the ACMA³ noted:

“Pre-prepared captions deliver text simultaneous with the dialogue, and quality assurance can be conducted prior to broadcast. By contrast, this is *impossible* with live captioning...

“Ai-Media, and our broadcast clients, adopt distinct and precise quality standards for pre-recorded and live captioning; and communicate to viewers when live captioning is being deployed [so as to alert the viewer to have lower quality expectations]...

“We employ different staff, with different skill sets, for pre-recorded and live captioning.”

¹ Ofcom, “Measuring Live Subtitling Quality” 30 April 2014

<http://stakeholders.ofcom.org.uk/binaries/consultations/subtitling/statement/sampling-report.pdf>

² <http://stakeholders.ofcom.org.uk/binaries/consultations/subtitling/statement/sampling-report.pdf>

³ <http://www.ai-media.tv/wp-content/uploads/2014/10/20130122-Ai-Media-ACMA-Submission-Captioning-Standard-FINAL.pdf>



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As Media Access Australia (MAA) notes “The best way to improve live captioning is to avoid it”.⁴ MAA argues that the quality differential between pre-prepared and live captioning is so great that wherever possible, scripts, running orders and pre-recorded video packages should be sent to caption providers in advance to permit pre-preparation of as many captions as possible.

Pre-preparing live captioning is not a panacea. The method is more expensive, and also contains risks that the presenter will go “off script”, or segments can get changed at the last minute, leaving pre-prepared captions not matching the content. Finally, for much television (such as unscripted chat/panel shows and live sport) it is simply impossible to pre-prepare captions – and captioning on this content will always be of a lower quality as a result. This does not mean that live captioning sport or chat shows is not valuable or meaningful to viewers; it simply means that viewers must bear a higher tolerance for errors in a live environment.

In its rejection of the many submissions to differentiate live and pre-recorded captioning in its 2013 review, the ACMA noted:⁵

“The ACMA considers that setting separate requirements for the quality of live and pre-prepared captions is not helpful in achieving the objective that the captioning service should be meaningful to viewers, regardless of the captioning process.”

This argument misses the point.

No-one suggests that live captioning can’t be meaningful, it simply cannot be as “readable, accurate or comprehensible” as pre-recorded captioning. The legislation should be clear and unambiguous so consumer expectations can be set accordingly.

Ai-Media has had the benefit of reviewing ASTRA’s draft submission and supports ASTRA’s arguments for the inclusion of the proposed 130ZZA(2A) and the exclusion of 130ZZA(2B) as a means of achieving this outcome.

4. The ACMA should take into account NER, or an alternative industry standard, when measuring captioning quality

Under the Captioning Quality Standard, captioning quality is to be determined by the “cumulative effect” of the three key components of “readability, accuracy and comprehensibility” of the captions.

These three key components are often trade-offs that must be weighed against each other.

⁴ http://www.mediaaccess.org.au/latest_news/policy-legislation/five-live-caption-quality-issues-from-the-uk

⁵ ACMA, “Development of the draft Broadcasting Services (Television Captioning) Standard 2013 Consultation paper” 2012 - www.acma.gov.au/theACMA/Consultations/Consultations/Completed/captioning-quality



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For example, in the context of fast flowing live dialogue, an accurate textual representation of the spoken word may be too fast to read, compromising the content's comprehensibility. In live sport captioning, including the "play of the ball" captioning, while accurate and readable, is unlikely to be comprehensible with even a delay of a few seconds (as the ball will have moved on by that time).

Within the last 12 months, international industry consensus has emerged around the international NER⁶ model as the standard for measuring captioning quality, and quantifying these competing trade-offs. Ofcom has adopted it.

The NER model analyses and weights the complexity of live captioning with the seriousness of the error compared to the spoken word, yielding a percentage score. The NER model was selected because of its alignment with the overall perception of quality by viewers.

Further details on the NER model are provided in Appendix 1.

In addition to its sound research base and proven alignment to the viewer experience, the NER model delivers scores that are internationally comparable, auditable and relatively consistent (typically around 0.1%).

Captioning Quotas

5. Scrap the repeat rule – quotas are cleaner

Superficially attractive, the "repeat rule" for subscription broadcasters, has negative unintended consequences, is impossible to enforce, and is unnecessary given the commercial imperatives on broadcasters to fill their quotas.

Ai-Media refers the Committee to the ASTRA submission which provides further detail on the consequences of the repeat rule.

As Media Access Australia notes:

"This is a requirement that is essentially impossible for the Australian Communications and Media Authority (ACMA) to enforce. There is no single database that records which programs were screened on which channels, and whether they were captioned or not. Programs move around all the time, from primary channels to multichannels, and from subscription television to free-to-air television."⁷

Ai-Media supports the reasoning of Media Access Australia on this issue, and urges the discontinuation of the repeat rule wherever a channel has its own captioning quotas.

As an intermediate position, Ai-Media supports ASTRA's submission to restrict the rule to channels owned by a single entity.

⁶ Romero-Fresco, P. (2011), *Subtitling through speech recognition: respeaking*, St Jerome Publishing Manchester

⁷ http://www.mediaaccess.org.au/latest_news/news/repealing-captioning-red-tape-captioning-of-repeats-on-multichannels



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6. Sports channels should be able to be aggregated where content is effectively interchangeable

Ai-Media has had the benefit of reviewing, and supports ASTRA's submission on this issue.

7. Simplify and make reporting more meaningful, timely and transparent

The current ACMA reporting forms are onerous⁸ with each individual outage requiring a line item entry – no matter how small the interruption to service – in an environment of 100% captioning requirements.

These reports are neither timely (being delivered up to 15 months after broadcast), nor helpful to consumers.

The forms add considerable reporting burdens on broadcasters who have to manually transfer data from their own systems to the ACMA forms with 17 cells needing to be completed for a 30-second outage. Extracts from the forms are provided below.

Ai-Media notes consumer groups have expressed concern at the proposed elimination of all reporting by Free-to-Air channels and suggests that an intermediate position may be to focus on a simple, easy to generate, verifiable report such as "percentage of target achieved".

This single percentage number, generated from the broadcaster's internal systems, of captioning quota achieved in a quarter (eg June-September 2014, 99.7%) would provide timely information, consumer safeguards, and hold captioning suppliers to account in a competitive market.

Ai-Media supports the proposed new section 130ZZD which requires broadcasters to keep written records enabling the ACMA to ascertain compliance with captioning quotas.

⁸ <http://www.acma.gov.au/Citizen/Consumer-info/Rights-and-safeguards/Captioning/captioning-obligations-on-freetoair-subscription-television-i-acma>

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1	Other Instances of non-compliance										Other Instances of non-compliance				Other I
2	(not S.130ZUB - i.e not caused by unforeseen significant technical/engineering difficulties)										(not S.130ZUB - i.e not caused by unforeseen significant technical/engineering difficulties)				(not S
3	The programs listed below cannot be claimed as part of the total hours of captioned programs declared at question a)) on the Compliance tab										The programs listed below cannot be claimed as part of the total hours of captioned programs declared at question a)) on the Compliance tab				The prog
4	*Only complete this column if the actual duration of non-compliant program is shorter than the total duration in the previous column										*Only complete this column if the actual duration of non-compliant program is shorter than the total duration in the previous column				*Only con
5	** Program name/s optional if 'Total duration' is longer than two hours, unless only one program was broadcast (see e.g. 1 and e.g. 2 below)										** Program name/s optional if 'Total duration' is longer than two hours, unless only one program was broadcast (see e.g. 1 and e.g. 2 below)				** Progra
6	Automatic calculation														
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9	N o.	Start date dd/mm/yy	Start time (24hr)	End date (dd/mm/yy) (Optional)	End time (24hr) (Optional)	Total duration (hh:mm)	Duration of non-compliant program(s) or discreet segment of program*	1) Did this instance contribute to non-compliance with the annual captioning target	2) Program name(s)**	3) Captioning issue	3a) Captioning issues identified by: (optional)	4) Specify the captioning obligation that was not satisfied	4a) If you included '3. Captioning programs on multi-channels previously transmitted with captions on core channel' in the previous column, please list the name(s) of the multi- channel(s) affected	5) Reasons for non-compliance	6) Please affect: (option)
10	# 2	11/2/2012	11:00	11/2/2012	11:29	0:29		No	Local/News	No captions	Complainant	2. Captioning news or current affairs programs outside designated viewing hours - S.130ZB(1)(b)		Miscommunication between captioning service provider & licensee/broadcaster	
11	# 2	24/10/2012	20:30	24/10/2012	21:30	1:00		Yes	Silcom world	Quality of captions	Broadcaster	1. Providing captioned programs during designated viewing hours - S.130ZB(1)(a)		Staff error	
12	1														
13	2														
14	3														
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Instances of non-compliance - S.130ZUB (considered by the licensee/broadcaster to be caused by unforeseen significant technical or engineering difficulties)							Instances of non-compliance - S.130ZUB (considered by the licensee/broadcaster to be caused by unforeseen significant technical or engineering difficulties)							Instances of non-compliance - S.130ZUB (considered by the licensee/broadcaster to be caused by unforeseen significant technical or engineering difficulties)						
The programs listed below cannot be claimed as part of the total hours of captioned programs declared at question a)) on the Compliance tab *Only complete this column if the actual duration of non-compliant program is shorter than the total duration in the previous column (see e.g. 3 and 4 below) ** Program name/s optional if 'Total duration' is longer than two hours, unless only one program was broadcast (see e.g. 1 and e.g. 2 below)							The programs listed below cannot be claimed as part of the total hours of captioned programs declared at question a)) on the Compliance tab *Only complete this column if the actual duration of non-compliant program is shorter than the total duration in the previous column (see e.g. 3 and 4 below) ** Program name/s optional if 'Total duration' is longer than two hours, unless only one program was broadcast (see e.g. 1 and e.g. 2 below)							The programs listed below cannot be claimed as part of the total hours of captioned programs declared at question a)) on the Compliance tab *Only complete this column if the actual duration of non-compliant program is shorter than the total duration in the previous column (see e.g. 3 and 4 below) ** Program name/s optional if 'Total duration' is longer than two hours, unless only one program was broadcast (see e.g. 1 and e.g. 2 below)						
Automatic calculation Sum of column G and F (if column G is blank) will be displayed in hh:mm format at cell G7 if there is also a corresponding "Yes" at column H, after relevant details on the tab are completed.							Automatic calculation Sum of column G and F (if column G is blank) will be displayed in hh:mm format at cell G7 if there is also a corresponding "Yes" at column H, after relevant details on the tab are completed.							Automatic calculation Sum of column G and F (if column G is blank) will be displayed in hh:mm format at cell G7 if there is also a corresponding "Yes" at column H, after relevant details on the tab are completed.						
N o.	Start date (dd/mm/yy)	Start time (24hr)	End date (dd/mm/yy) (Optional)	End time (24hr) (Optional)	Total duration (hh:mm)	Duration of non-compliant program(s) or discreet segment of program*	1) Did this instance contribute to non-compliance with the annual captioning target	2) Program name(s)**	3) Captioning issue	3a) Captioning issues identified by: (optional)	4) Specify the captioning obligation that was not satisfied	4a) If you included '3. Captioning programs on multi-channels previously transmitted with captions on core channel' in the previous column, please list the name(s) of the multi-channel(s) affected	5) Nature of unforeseen significant technical/engineering difficulties	5a) Please provide further details of this instance including the reason you believe it to have been unforeseen	5b) Please provide further details of this instance including the reason you believe it to have been unforeseen	6) Please list the affected area - if this instance only affected part of your licence/covers area (optional)	7) Please indicate steps you have taken any			
# 1	12/10/12	18:58	12/10/12	21:42	2:42		No	The Partman's Last Stand	Mixing caption/quality of caption	Complainant	3. Captioning programs on multi-channels previously transmitted with captions on core channel - S.130ZB	FAR	Failure of caption management system	Equipment has not failed previously			Faulty equipment repaired			
# 2	10/11/12	23:00	10/11/12	0:16	23:42		No	n/a	No caption	Broadcaster	5. Combination of 10 2	n/a	Power outage	Atmospheric - due to natural disaster	Localised flooding affected transmission tower at Metcham 5. Day only - population 40K. Normal transmission resumed after 10 days of licence area		Random weekly spot checks introduced 10/11/12			
# 3	2/10/13	18:00	2/10/13	18:58	0:58	0:00	Yes	Near	Mixing caption	Complainant	1. Providing captioned programs during designated off-air hours - S.130ZB (1)a	n/a	Software failure	Live captioning software failed for a few minutes during broadcast of the 6 minute segment. The 6 minute segment was not included in our captioning programme totals		Software upgraded and tested				
# 4	5/10/13	2:00	5/10/13	3:00	1:00	0:25	No	Near	Mixing caption	Third-party	2. Captioning a program current affairs programme outside designated off-air hours - S.130ZB (1)b	n/a	Failure of transmission encoder/de-clip	Issue with compatibility of new equipment			Engineers have fixed the issue. It has caused no harm			
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8. Avoid additional red-tape of “technical or engineering” issues by setting an acceptable benchmark of lost time in the context of 100% captioning quotas

Ai-Media supports the proposed new subsection 130ZZA(7A), in conjunction with an additional subsection 130ZZA(7B), to avoid creating further red tape for trivial outages in a regulatory environment of 100% captioning.

Ai-Media accepts the logic in the Explanatory Memorandum that “a broadcaster’s captioning service may at times be affected by particular circumstances and factors that may be outside of the relevant broadcaster’s control”.

To avoid costly case-by-case justification for small quota outages (in the context of 100% captioning quotas), we propose an additional clause where no justification would be required to be proven to the ACMA where total lost time did not exceed 0.5%.

Subsection 130ZZA(7B) could be added:

(7B) A failure by a licensee or broadcaster to comply with a standard determined under subsection (1) is to be disregarded to the extent to which compliance exceeds 99.5%.

The ACMA would be empowered to find the broadcaster in breach if the cumulative impact of failure fell below the 99.5% and there were no technical or engineering exemptions within subsection 130ZZA(7A).



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Appendix 1: How NER works⁹

What does NER measure?

The NER software is used to measure the **quality of the experience of the viewer**.

How does the software work?

It identifies discrepancies between the Caption file and the Verbatim Transcript (a word-for-word transcript of what is heard). The Reviewer then makes a judgement on the effect the discrepancy has on the viewer.

Are all discrepancies penalised?

The discrepancies NER identifies are any words in the Verbatim Transcript which it cannot find in the Captions and vice versa. The role of the Reviewer is to judge whether the discrepancy is in fact an error, i.e. a misrecognition or missing information. If a discrepancy is the result of successful paraphrasing of the captioner with no information missing, the reviewer will give the 'discrepancy' a weighting of 0.0, meaning NER will ignore it when it calculates the score.

How does the reviewer decide how serious errors are?

For discrepancies which the Reviewer judges to be errors (either misrecognitions or unsuccessful paraphrasing/missing information), a weighting of 0.25, 0.5 or 1.0 will be allocated, depending on the severity of the impact the error has on the viewers' experience and comprehension.

It is recommended within the NER systems that only serious (1.0) errors be corrected on air, as trying to correct minor (0.25) and standard (0.5) errors result in greater loss of information due to captions falling behind the broadcast further.

What is a minor (0.25) error?

Minor errors tend to be misrecognitions that impact the viewers' experience by causing momentary confusion, but which don't obscure the intended meaning.

Eg. *for players on the bench Vs. four players on the bench*

What is a standard (0.5) error?

Standard errors result in the viewer missing out on a unit of information. For example, a misrecognition that is so confusing it obscures the intended meaning, or a piece of information that was missing from the captions altogether (including unsuccessful paraphrasing).

Eg. *paid in full by pizza Vs. paid in full by Visa*

⁹ Romero-Fresco, P. (2011), *Subtitling through speech recognition: respeaking*, St Jerome Publishing Manchester



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What is a serious (1.0) error?

A serious error is one which misleads the viewer. For example, a misrecognition, paraphrase or unit of missing information that completely changes the original meaning but appears feasible in the context.

Eg. *This is the first time these sides have met this year* **Vs.** *This isn't the first time these sides have met this year.*

How is the score calculated?

Once all errors have been 'weighted', NER calculates the Accuracy Score as follows:

$$\text{Accuracy} = \frac{\text{Number of words} - \text{total weight of errors}}{\text{Number of words}} \times 100\%$$

What is the expected score?

The acceptable quality rate, as agreed by Dr Pablo Ramero-Fresco, is 98%.