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CBC Radio-Canada

The English Language Broadcasters Group, comprising the Canadian Association of Broadcasters' English Membership and the Canadian Broadcasting Corporation

Report on Efforts to Improve the Quality of Closed Captioning

EBG
10/31/2014

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EBG Report to CRTC 2014

In compliance with Broadcast Regulatory Policy 2012-362.

Summary

1. This report is a joint submission from the English Broadcasters' Group (EBG) to the Canadian Radio-television and Telecommunications Commission (CRTC).

2. In the Appendix to Broadcasting Regulatory Policy (BRP) 2012-362, the Commission required that:

   Every month each broadcaster must calculate the accuracy rate for two programs containing live content.

   Every two years, broadcasters must provide the Commission with a report describing their efforts made in-house and requests to caption providers in order to improve the accuracy rate.

3. This submission constitutes the required first report. It is filed as a joint response on behalf of the Canadian Association of Broadcasters' English membership and the Canadian Broadcasting Corporation. The report has been co-ordinated by a working group consisting of Bell, the Canadian Broadcasting Corporation, Corus, Rogers, and Shaw, and is largely drawn from the experience of these companies. They have worked together throughout the two-year period since BRP 2012-362 came into effect, sharing best practices and comparing results. Moreover, all of these broadcasters work with the same four large third-party captioning providers, so it is appropriate that a joint report be filed. The EBG also interviewed third-party captioning providers for their views on the implementation of BRP 2012-362 for this report.

4. The experience of two years is detailed in the pages that follow. To summarize briefly, the following conclusions have been reached:

   - First, it is the consensus of broadcasters and captioners that the quality of captioning has improved over that time, due to the greater attention it has been given. A number of technical issues have been addressed, arising in part from resolving the complaints brought to broadcasters by their viewers.
   - Second, the implementation of the accuracy scoring system detailed in BRP 2012-362 has been challenging. While news programs have scored better under this system, only some shows in this category met the standard, and many other types of live programming have scored well under the required 95% accuracy rate, where accuracy is measured by comparison of captions with a verbatim transcription of program audio.
   - Third, broadcasters' and captioners' attempts to improve the "verbatim test" accuracy scores of programming have not resulted in improved quality – in fact, in many cases the experience of the viewer has suffered when captioners attempted verbatim transcription of programs that are not suited to this approach.

5. Verbatim transcription is always the goal of captioners, but under some conditions – e.g. when the speed of speech exceeds a rate that can be successfully transcribed by the captioner and read by the viewer – paraphrase becomes necessary. Captioners are trained to paraphrase under such circumstances, in order to provide an accurate and comprehensible viewing experience for the Deaf, deaf or hard-of-hearing audience. A good captioner will provide a good experience – but the result will score poorly in the accuracy test required by BRP 2012-362, because it is not a verbatim transcription.

- The EBG therefore attempted to devise and propose a new scoring system that would better reflect quality with respect to accuracy. Many hours were devoted to this discussion, and a method was attempted. The basis of this new system was program time, rather than word count, and the scoring system did not necessarily count errors when the captioner paraphrased, as long as comprehensibility and meaning were preserved. This was in keeping with captioners' training and their understanding of quality.

6. However, these efforts were not successful: the goal of an "objective" scoring system that could be applied consistently to many programs by many monitors was not met, because the accurate rendition of meaning is, by its nature, a subjective judgment.

7. The EBG has therefore turned its attention outward, examining how other jurisdictions have approached the question of accuracy, and has concluded that there is merit in one of these approaches.

8. Canada led the rest of the world in establishing captioning quality standards, but in the years since 2012, other jurisdictions have developed methods that are worth examination. For example, the American Federal Communications Commission (FCC) issued a decision in February of 2014 that deals with the issue of captioning quality standards for live programming. Since many of the programs broadcast in English Canada originate in the US, and will be broadcast in this country according to these new standards, it seemed appropriate to give them close examination.

9. The result of all these steps is represented in the final section of this submission: it will deal with the EBG's proposals to move forward in the improvement of captioning, with specific attention to the question of providing satisfactory accuracy.

10. What the EBG is proposing can be summarized as three initiatives:

    1. The EBG will request that the newly-formed Broadcasting Accessibility Fund solicit proposals from researchers and entrepreneurs to develop new techniques and tools to aid the captioner to achieve quality, as quality is understood by captioners and the general public that uses captioning.
    2. The EBG proposes to modify the current "verbatim test" monitoring with monitoring based on assessments that determine whether program captions "provide an equivalent experience" to the audio (FCC wording) by assessing whether program captions:
       - Are not lost or garbled
       - Are appropriately placed on screen
       - Are at least as comprehensible as the audio
       - Provide the caption viewer with the same meaning as the audio track

       Programs would receive an appropriate rating from "excellent" to "poor" based on these criteria and if needed, corrective action would be taken.
    3. The EBG submits that this amendment to BRP 2012-362 can be undertaken via an interpretation bulletin or an amendment, with public comment at the Commission's discretion.

11. The EBG wishes to make clear that while the current method of measuring accuracy does not give an accurate reading of quality, and consequently is not helpful in improving quality, the EBG believes that improvement is possible and should be pursued. In this respect, the EBG notes recent comments by the CRTC Chair calling for a "change in focus from rules to outcomes, from conformity to experimentation …" and submits that the analysis and proposals in this report are aligned with those aims.

LEARNING AND IMPROVING SINCE BRP 2012-362

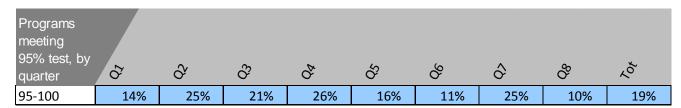### WHAT THE EBG LEARNED FROM THE VERBATIM TEST ACCURACY MONITORING

12. The implementation of the accuracy scoring system detailed in BRP 2012-362 has been challenging. The broadcasters began in September 2012 as required, and quickly found that the monitoring was a labour-intensive process that required an employee to prepare a verbatim transcript and compare it word-for-word with the captioning as recorded, assessing different errors.

13. To monitor and score a half-hour of programming initially took anywhere up to 20 person-hours. Different techniques were tried, and meetings with all EBG members were initiated in October 2012 to discuss methods. In May of the following year these meetings became regular to discuss results and new ways of improving accuracy. Scoring became more consistent and scoring times came down, but can still be 8 hours or more for programs with significant discrepancies from verbatim.

14. The broadcasters also invited a provider to come to a meeting and talk about the decision-making process behind live captionists' choices on what to capture in the captions. This led to a greater understanding on the part of the in-house staff doing the monitoring about why captions are sometimes rendered the way that they are (that is, not verbatim).

15. Over the two year period, broadcasters also began to select a wider variety of programs to monitor. As it became clear that few programs could score over 95%, the focus changed to increasing knowledge and understanding of captioning accuracy. A variety of program types and program production situations were evaluated. In preparing this document, the EBG members assembled the data from 265 programs that were monitored over the preceding two years. Each of these programs was captioned live as it was broadcast, and reflected the typical situation for live shows: that is, captionists had access to pertinent information about program content, but not a pre-prepared script. This data provides a useful background to the lessons that the broadcasters and caption companies learned over that period.

95% WAS NOT ACHIEVED VERY OFTEN

16. Overall, 19% of the programs monitored met the 95% verbatim accuracy test established in BRP 2012-362.

AWARENESS OF THE STANDARD DID NOT IMPROVE SCORES

17. The percentage of programs in each quarter that met the standard varied from a low of 11% to a high of 26%, but there is no discernible trend in the scores. 25% was achieved in the second quarter of testing, and the second-last quarter of results in the sample showed 25%. While broadcasters were putting pressure on captioning companies to improve these scores, and captioning companies in turn were stressing the importance of verbatim accuracy to their captioners, their efforts did not improve scores.

Programs meeting 95% test, by quarter	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Tot
95-100	14%	25%	21%	26%	16%	11%	25%	10%	19%

SCORES VARY WITH THE TYPE OF PROGRAMMING

18. While most programs clustered around an 85% median, broadcasters observed variances, and began to analyze a variety of monitored programs, to see whether different categories of programming scored consistently. The category clearly makes a difference:

Median Scores per Category	News	Magazine	Sports	Sports Talk	Talk
All Groups	91.0%	82.6%	75.0%	81.1%	87.0%

19. News programs score the highest. Only in News is it possible to generally score above 85% because the formal, scripted style with a measured pace typically lends itself to verbatim captioning for a large part of the broadcast, though there are often sections (panels, interviews) that are more difficult. Each of the four broadcasters monitored a number of newscasts, and the median score over the two-year period was 91% on the verbatim test.

20. Sports programs have, not surprisingly, the lowest scores. Speed of speech is an issue, and also, sports captioners do not always caption the play-by-play. In some sports (hockey is a good example), the voices lag behind the play and the captions lag behind the voices – by the time captions appear, they are well behind the action on the screen, and of relatively little use to the viewer. Moreover, captions can cover the action wherever they are positioned, and may simply annoy the viewer during play.

21. Not many sports broadcasts were monitored, because it was clear to the broadcasters that verbatim transcription was not being attempted. In fact, it would have been permissible to monitor no sports at all under the Conditions of Licence – to monitor only news programs for example – and report a better set of scores.

22. However, all live programs are covered by the standard, and the members of the EBG decided it was more important to monitor a range of programming to learn how accuracy might be improved. The EBG recognizes that the scoring system was put in place by the Commission in order to improve captioning quality. That is also the goal of the EBG – and it made little sense to avoid the issue. The EBG believed it was better to confront the low "verbatim test" scores and see if something can be learned about accuracy and how to improve it.

23. To further this aim, an interview was conducted with a prominent sports captioning specialist in the course of preparing this report. He provided considerable insight into the thought processes of a captioner, and how one could best serve the viewing audience.

24. Among other points, he noted that not all sports are the same, and within a sport, the on-air team makes a big difference: some talk continually, others "allow the telecast to breathe". Some sports, like tennis, are relatively easy to caption, because the hosts don't talk over the action; others, like US football, have lots of talk and are more difficult because of rapid speech. The scores for sports in this table would be lower except that a few tennis matches were included.

25. Talk programs – panel discussions and magazine programs – are in the middle, but typically below the standard. The speed of speech in these programs makes them challenging, in addition to the fact that several people speak at once from time to time, all of which makes it difficult to render the audio into comprehensible text. Consequently, captioners paraphrase to ensure meaning is carried, and the result is low scores because they are not verbatim in these sections.

26. The main conclusion to be derived from this table is that it is sometimes possible – though not always, because of human factors – for news programs to meet the "verbatim test" of accuracy, but other program types simply cannot.

RAPID SPEECH MAKES A DIFFERENCE

27. It's clear that rapid speech is a constant issue for captioners. Not only is it hard to caption such speech accurately, but a verbatim transcript of rapid speech can exceed the viewers' reading speed, so it can interfere with comprehensibility. Any program may contain sections of rapid speech – even news may contain an interview or a weather segment (as illustrated in an attached video segment) that causes the captioner to begin paraphrasing, as they are trained to do.

28. Since the scoring data included the total word count in the audio, it is possible to calculate an average "words per minute" (WPM) number and compare it with scoring results. Such an average is a crude indicator, since it does not track shorter program sections of rapid speech. However, in a program whose average WPM is high, one can expect that there will be program sections of extremely rapid speech.

29. To estimate the effect, we divided programs into five "speed groups": the slowest programs had an average WPM between 90 and 135, and the fastest exceeded 270 wpm. We then looked at the median accuracy score of programs in each speed group and program type.

Median Scores per Speed Group	News	Magazine	Sports	Sports Talk	Talk	Average WPM is above
2	96%		82%	76%		90
3	88%	68%	90%	89%	89%	135
4	91%	83%	73%	88%	86%	180
5	90%	86%	54%	65%	89%	225
6				65%		270

   a. News, magazine and talk program scores did not deteriorate with speed, but they did not reach the top speed group, either.

   b. Sports scored better at lower speeds but deteriorated rapidly as speed increased.

   c. Sports-themed talk programs showed a similar deterioration.

30. This is to be sure, a crude measure, but it does indicate that scripted programs – news and magazine shows – can have speeds of up to 225 WPM without causing lower scores. In sports-themed shows, it does seem that scores drop with speed, indicating, possibly, that captioners need to paraphrase more often.

31. It also supports the view that there is no set "words-per-minute" at which paraphrasing becomes necessary – the captioner balances a number of factors in making this determination. In fact, the sports captioner interviewed for this report indicated that "syllable densification" is more problematic than word count. He noted, for example, that unexpected proper names from some language groups are more difficult to caption, simply because they are longer.

32. These points can perhaps be best illustrated with some examples from marked scripts of real programs.

*CBC - Lang and O'Leary Exchange **Air Date** – January 24th, 2014*
RED Text is missing words BLUE Text is misspelled words

Verbatim transcript

WELL LET'S START HERE WITH WHAT'S
GOING ON IN THE MARKETS AND IT'S
INTERESTING BECAUSE WE'VE BEEN
TALKING FOR -- TO THE WEEKS
LEADING UP TO THE BEGINNING OF THE
NEW YEAR AND INTO THE NEW YEAR THIS,
THE RALLY IN AMERICAN
MARKETS, ON THE BACK OF MAYBE
SOME IMPROVED FUNDAMENTALS.
BUT WHAT WE'RE SEEING HERE, SOME
PEOPLE THINK, IS A STRONG
REACTION TO CONCERNS ABOUT
TAPERING IN EMERGING MARKETS
AND A KIND OF -- I SAW THE WORD
CONTAGION TODAY, IT'S NOT A WORD
YOU WANT TO USE LIGHTLY BUT IT
DID SORT OF SEEM TO HAVE ONE OF THOSE KIND OF
SPILL OVER
EFFECTS ACROSS THE GLOBE WENT RIGHT BACK
TO THE DOW JONES WHICH IS DOWN ALMOST 2%
TODAY.

Captions as broadcast

LET'S START HERE WITH WHAT'S
GOING ON IN THE MARKETS AND IT'S
INTERESTING BECAUSE WE'VE BEEN
TAKING FOUR THROUGH THE WEEKS
LEADING UP TO THE BEGINNING
NEW YEAR AND INTO THE NEW YEAR
OF THE RALLY IN AMERICAN
MARKETS, ON THE BACK OF MAYBE
SOME IMPROVED FUNDAMENTALS.
BUT WHAT WE'RE SEEING HERE, SOME
PEOPLE THINK, IS A STRONG
REACTION TO CONCERNS ABOUT
TAPERING AND EMERGING MARKETS
AND A KIND OF -- I SAW THE WORD
CONTAGION TODAY, IT'S NOT A WORD
YOU WANT TO USE LIGHTLY BUT IT
DID SEEM TO HAVE A SPILL OVER
EFFECT ACROSS THE GLOBE AND DOWN
TO THE DOW JONES ALMOST 2%
TODAY.

33. In this excerpt, the Verbatim Test Score would be 82% - 122 is the total word count, with 22 words that are different from the verbatim transcript and marked as errors. However, the ad-libbed verbatim speech is not very grammatical and the captioner is clearly making an effort to make it comprehensible in text through paraphrase. Perhaps 16 of the verbatim errors – individual judgments might vary – are due to paraphrasing.

Name of Program: Global National
Date of airing: October 6, 2014
RED Text is missing words YELLOW Text is misspelled words

Verbatim

>>> TO THE EBOLA OUTBREAK NOW
AND A DIRE WARNING TODAY FROM
ONE OF THE AID GROUPS ON THE
GROUND.
UNICEF HAS NOW DECLARED EBOLA AN
EXTREME CRISIS.
IT HAS LEFT THOUSANDS OF WEST
AFRICAN CHILDREN ORPHANED.
COUNTRIES THERE JUST DON'T HAVE
THE SOPHISTICATED MEDICAL CARE

Captions

>>> TO THE EBOLA OUTBREAK
AND A DIRE WARNING FROM
ONE OF THE AID GROUPS ON THE
GROUND.
UNICEF HAS DECLARED EBOLA AN
EXTREME CRISIS.
IT HAS LEFT THOUSANDS OF WEST
AFRICAN CHILDREN ORPHANED.
COUNTRIES DON'T HAVE
THE SOPHISTICATED MEDICAL CARE

Verbatim	Captions
NEEDED TO CONTROL THE SPREAD OF THE VIRUS, AND AS JACKSON PROSKOW REPORTS, ANOTHER CASE HAS TURNED UP IN THE UNITED STATES.	NEEDED TO CONTROL THE SPREAD OF THE VIRUS, AND AS JACKSON PROSKOW REPORTS, ANOTHER CASEP *(>> REPORTER: BACK ON AMERICAN SOIL.)*

34. The "verbatim test" score of this section would have been 80%.

35. The section quoted above illustrates how the captionist has reduced lag time by skipping over words. The most serious omission is the 7 words at the end, a gap which, in the captionist's judgment, would have become clear to the reader in the context of the following remark from the reporter.

36. There were also 5 words whose absence did not change the meaning.

Compass News (CBC)
Air Date – January 16, 2014

Verbatim	Captions
FROM ZERO GRAVITY THRILLS TO DRAMATIC TRUE STORIES, SEEMS THERE'S A BIT OF SOMETHING IN THIS FOR EVERYONE. ~~~ MONITOR PRICE WATERHOUSE COOPERS HAS COME UP WITH A PLAN TO RESTRUCTURE. ~~~ >> Bruce: ALRIGHT BOOMER HAS MORE SHORTLY. NOW UP NEXT ON "COMPASS," A ROYAL LOOK BACK WITH THE ANNOUNCEMENT	FROM ZERO GRAVITY THRILLS TO DRAMATIC TRUE STORIES, THERE'S SOMETHING IN THIS FOR EVERYONE. ~~~ MONITOR PRICE WATERHOUSE COOPERS HAS COME UP WITH A RESTRUCTURING PLAN. ~~~ >> Bruce: BOOMER HAS MORE SHORTLY. UP NEXT ON "COMPASS," A ROYAL LOOK BACK WITH THE ANNOUNCEMENT

37. The excerpts above illustrate the point that some "errors" are *de minimis* – that is, the departures from verbatim do not change the meaning of the spoken words, or detract from the caption viewer's experience.

VIDEO EXAMPLES

38. As a final trial on this question, EBG members took clips of televised programs and re-captioned them with a verbatim transcript, assembled after the fact. These demonstrate that while verbatim captioning is the ideal, in some circumstances it does not make for the best captioning.

39. These video files will be supplied to the Commission by courier as soon as possible.

    a. CityTV Weathercast

    This weather cast demonstrates that even if the captionist could keep up with the speed of this clip – which exceeds 300 WPM in sections – the resulting verbatim transcript is almost unreadable, and is certainly not preferable to the intelligent paraphrase provided by the captioner.

It is worth noting that in the preparation of this video, the attempt to re-caption the segment with a full verbatim transcript required "working around" the captioning software, which simply would not produce captions at verbatim speed, instead dropping words and characters at random.

b. Bell: "The Social"

This clip demonstrates the disruptive effect of "cross-talk" on captioning. The verbatim test requires that all words be captioned, even when people speak over top of each other. However, the verbatim transcript for this exchange is less comprehensible and certainly not preferable to the original captions, which give a good rendering of the content and the spirit of the discussion.

c. CBC: "Steven and Chris"

This third clip illustrates a different point. While there are significant moments of cross-talk in it, the captioner on the original broadcast does a remarkable job of sorting this out and presenting the meaning and even the inflection of the conversation. The speed of speech is a bit slower than the clips noted above but it is still not possible to live-caption every word verbatim. While not impossible to read in short sections, it would be quite fatiguing to the viewer to read at that speed for extended periods.

Finally, in spite of the fact that the original and verbatim captions do not appear to be that different, the score for the segment is still well under 95%.

40. In each of these cases, the captioner has had to make a decision to paraphrase, rather than attempt verbatim transcription. The result, in each case, is very good captioning - sometimes it is excellent. But in each case, the score on the "verbatim test" is well below the required 95%.

41. In all cases, it is important to note that verbatim captioning at this speed and over cross-talk is simply not possible in a live situation. On top of that, the verbatim captioning inserted in the examples is not preferable to a good paraphrase, and caption users would find it less comprehensible, fatiguing and frustrating. Verbatim does not always represent "higher quality". In fact, as seen in the section on "Complaints" below, while there were six complaints mentioning accuracy in the last two years, there were also three complaints about "captions going too fast".

42. These segments illustrate that television captioning is not court reporting. In court reporting, verbatim transcription is a requirement – in television, it can sometimes be a hindrance to a comprehensible and enjoyable experience.

43. **Live television captioning is actually closer to simultaneous translation.** Good simultaneous translators do not render each word of English literally into one of French – on the contrary, they are constantly concerned with rendering the meaning as idiomatically as possible, so that their listener's experience is equivalent to that of a native speaker. Another analogy would be simultaneous translation into American Sign Language (ASL). Sign language interpreters also use distinct ASL idioms and grammar to render English and other languages, though, like captioners, they sometimes fingerspell English words.

44. In just this way, a good captioner is rendering an audio experience into text. On some material, because of the speed of steno-captioning, it is possible and desirable to render speech into text word-for-word. But in many kinds of programming, it is not possible; the art of the captioner then is to find the paraphrase that creates the "equivalent experience" for the caption reader.

45. It does a disservice to these highly skilled women and men to determine that their captioning is of low quality when it does not meet the requirements of the verbatim test. The unintended consequence of this test is that good quality captioning can be marked low, and less comprehensible captioning marked higher.

Conclusion

46. The EBG acknowledges that there are real errors in captioning, and is working with caption providers to reduce them. But as the above examples illustrate, there are many cases where captionists must use their judgment and paraphrase in a way that preserves meaning in text form. In some cases they improve on the verbatim transcript of an ad-libbed section. The point is not that captioning accuracy cannot be improved – the point is simply that the verbatim test is not a true measure of captioning quality, because it does not recognize the positive value of a good paraphrase.

47. The EBG believes that the Commission's intention in BRP 2012-362 was to create a monitoring system to make broadcasters aware of accuracy and ensure that they would bring pressure to bear on third-party captioners to improve their accuracy scores. That was successful, in part. That is, pressure was brought to bear, and awareness improved.

48. However, scores did not rise any higher. The real benefit was that broadcasters acquired more evidence about the value of verbatim scoring in determining whether or not captioning was accurate. After two years of experience, it has been verified that while verbatim scoring may be useful at times, it is not a reliable determinant of accuracy, because, for good reasons, captioners are not attempting verbatim transcription all the time; instead, they are achieving better quality through adept paraphrase.

What the EBG Learned from Viewer Complaints

49. In BRP 2012-362, the Commission noted that the broadcasters had not supported their view of appropriate captioning standards with sufficient evidence. Moving forward, the EBG had access to new sources of evidence: some came from the scores obtained in the twice-monthly monitoring noted above; some from conversations with the third-party caption companies who deal with accuracy on a daily basis.

50. However, it may be that the best evidence of caption users' concerns comes from viewer complaints. When a member of the public is sufficiently motivated to make a complaint to the broadcaster and to the Commission, it is a strong indication that they care about the issue.

51. Over the period since BRP 2012-362 was implemented, broadcasters have corrected and improved a number of systems as a result of the learning acquired through addressing viewer complaints. For this submission, the five broadcasters involved assembled an overview of the official complaints received and how they were dealt with.

52. Altogether, 59 complaints were received by the broadcasters from September 2012 to September 2014, and all were dealt with. The Commission has a record of each of these. Since some complaints dealt with more than one issue, 66 issues were included in the 59 complaints.

53. The complaints came from 14 different caption users; however, 41 of them – 69.5% of the total – originated from a single person, so it is not possible to say that they represent a cross-section of the views of caption users, and this report will not focus heavily on statistics drawn from this sample.

54. There are some items worth noting, however. The first is that the greatest concern of all was with captions that were missing or garbled. 61% of the complaints dealt with these issues; within the set of complaints that dealt with live captioning (73% of the total) 53% were about missing or garbled captions[1].

55. The second greatest concern was the placement of captions. This issue was raised 17 times, almost all of them with respect to live-captioned programming.

56. Neither accuracy nor timing issues were mentioned often – there were 6 complaints about accuracy – all in live programming – 3 about lag-time, of which 2 instances were in live shows. "Captions going too fast" was raised 3 times, all in pre-recorded shows, which are, of course, verbatim. This stands in stark contrast to the discussion prior to BRP 2012-362, in which most of the discussion was focus on accuracy and lag-time, though as noted, since nearly 70% of the complaints were from one person, one should not make too much of the statistics.

57. However, the numbers are very relevant in one sense – broadcasters naturally put great attention on complaints from their viewers, so a great deal of time was spent resolving the main issue: missing captions. This reflects the chief preoccupation of consumers and broadcasters over this period. Clearly, captions need to be present and they cannot be "garbled" if the caption viewer is to have a satisfactory experience.

MOST MISSING OR GARBLED CAPTIONS RESULT FROM TECHNICAL ISSUES

58. Most often, missing or "garbled" captions result from technical issues. The chain that brings captions to the viewer's set is long and involves many steps where things can go wrong.

59. The EBG found that when complaints described long outages in captioning, most frequently the fault originated outside the broadcast plant – that is, the captions were transmitted correctly but something intervened before captions were displayed on the TV set. There are several possible reasons for this occurrence:

    a. A weak signal at consumer premises is a frequent cause of garbled captions. For example, many hearing viewers see closed captioning on the sets that face the treadmills and other exercise equipment in exercise facilities. But many gyms "split" the feed that is provided by the BDU to save money. They often use cheap cable splitters, and thereby lower the power of the signal – the result is a signal that shows adequate video at the set, but in which the embedded data for captions is not strong enough for the set to interpret it properly. In such cases the broadcaster can advise on the problem but cannot correct it. "Garbled" captions can also result from problems with the encoders or with the lines connecting the captioner to the studio.

    b. Weak signals can also result from faulty amplifiers that carry the signal from the BDU head-end to the consumer premises. In such cases, it has been possible for the broadcaster, working with the BDU, to investigate the issue so it can be corrected. However, there are more head-ends than broadcasters can monitor, and plant maintenance is an ongoing process for BDUs, so we cannot expect that such problems will cease altogether.

    c. Some of the issues with missing captions did originate in the broadcast plant, and some of these were the result of the conversion of the system to high-definition. While it may seem that this

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[1] By "garbled", viewers mean that something is present on the screen, but it is not words or even legitimate characters. This phenomenon is not caused by captioning inaccuracies but by the failure of some piece of equipment in the chain to correctly translate what the captioner has sent.

conversion is over, there is still an ongoing process of replacement of older SD equipment with new HD equipment, and not all of this new gear is initially adjusted properly to pass captioning through the broadcast chain. These issues are being isolated, however, and will ultimately be eliminated altogether.

> *For example, in Complaint Case ID 503346, captioning appeared normal at the Global BC control room but was not appearing on ExpressVU or Shaw. The engineering group was able to narrow the problem down to equipment supplied by NTT Electronics in Japan, and opened up correspondence to find a long-term solution. In the meantime they installed a frame storer to stabilize the digital signal in Burnaby.*

> *As Global noted in its response, "Whenever there is a transition of this magnitude, there will inevitably be bugs in the system. … This is a bandaid solution, to make captioning available but the by no means does this mean we have stopped trying … the long term goal is to find out what the problem is between HD (high-definition) and NTT encoders/decoders and resolve the situation permanently."*

d. One of the more common technical problems originates with the telephone service in some parts of the country. Around the time that the new caption standards were being established, broadcasters were beginning to require all captioners to use an audio feed directly from the studio, which is typically fed to the captioner on a telephone line. Of course, the captioning data, originating with the captioner's computer, also usually flows back to the broadcaster either through a phone line or through the Internet using iCap software. This replaced a system in which the captioner sometimes worked from the broadcast audio, which added unacceptably to lag-time because of the time delays inherent in use of digital and satellite technology by BDUs. The insistence on the use of telephone lines to hear the audio has generally improved both lag-time and quality.

Sometimes, however, these connections fail –the audio line hangs up or the data line disconnects. In areas where phone quality is particularly poor, these errors may recur, resulting in successive gaps in the presence of captions. There have been cases where specific captioners could not be used by broadcasters because the quality of phone line in their area was not appropriate.

> *Case ID 674384 tells the story of a 9 minute caption outage as a result of connection problems. Noting that the iCap internet connection had been causing problems, the captionist was instructed to use a phone line. She tested the phone connection prior to captioning, and found no issues. However, the connection failed – after testing other possible problems, the captioner returned to using the iCap connection and was able to re-establish captions.*

60. Shaw reports: "All of our providers know that if their iCap software fails, they can switch to using an audio coupler. When an issue crops up on-air, staff at all of our stations get in touch via phone with the captioner, point out the problem and attempt to troubleshoot and improve things right then and there. To fix most issues, either the captioner or the station must deliberately disconnect the modem or the audio coupler or the encoder to reset the connection, which results in a temporary loss of captions as well. You do this to fix scrambled captions or loss of audio. The encoder has to be reset by the station and they need to be informed first by the captioner that there is an issue before they do this."

61. Most of these problems are resolved by the captionist, the provider company, or the broadcaster, since both providers and all of the EBG members have systems in place to monitor connections and ensure that the captioning is continuous. Any interruption alerts the supervising technicians who ensure that captioning is restored as soon as possible. Where captions are missing for short periods, it is often because of such disconnects. These short periods rarely result in complaints but are an irritation, so all parties monitor them closely.

62. For example, The Captioning Group supplies weekly fault reports to its broadcaster customers, like this one covering the period from February 3rd to 9th, 2014:

Date	Station	Program	Start Time	Contacted Production Centre	Captioner	Fault (Mountain Time)
06-Feb-14	**Edmonton**	**News Final**	**2300**	**No**	**JK**	**Modem disconnect at 2401. 15-second loss of captions.**
	Montreal					**No faults to report.**
	New Brunswick					**No faults to report.**
	Maritimes					**No faults to report.**

63. And of course, there are issues that arise on the captioner's premises. There is, unfortunately, no way to prevent occasional power outages or software faults that arise in the PC used by the captioner. Uninterruptable Power Supplies (UPS) will supply power during an outage, and this helps defer such issues, but these only last for a limited time; and there have been cases where captioners covering a long program were obliged to interrupt their work to start a generator, or cases where the caption company switched to an alternate captioner to cover for the one experiencing technical issues.

> *Captioning was interrupted for three minutes in case ID 673661 because of a power outage during a thunderstorm. In that case, the captionist had several UPS units, but one of them failed. The supplier re-emphasized with all its captionists the importance of checking their backup equipment regularly.*

> *This was the case in Case ID 667514, when a 90 minute power interruption in BC's lower mainland affected the captionist's home during her work on News Hour on Global Vancouver. Her UPS failed after ten minutes, and attempts to find a back-up captionist were unsuccessful so she connected her generator and resumed captioning. In the end the result was a 7 minute loss of captions.*

> *As Shaw noted in its response, "We are continually working with our captioning providers to ensure that issues such as this one are addressed to prevent future recurrence. However, even with multiple backup systems in place, it is difficult to anticipate all of the possible technical or human errors that might occur during live captioning."*

64. A final issue is caption placement, which was the subject of 16 complaints over the last two years, all on live programming. Placement is part of the quality standard, and broadcasters take it very seriously, specifying where captions should be placed for each program – sometimes placing them differently for different arenas in sports broadcasts. Nonetheless there are problems. In sports, the captioner cannot always anticipate the action on the screen in time to move captions away from the play. And in other cases, it must be recognized

that television sets and set-top boxes do not all display captions exactly the same way so the captioners' ability to place the captions in exactly the right place may be limited.

> *In Complaint 644218-1, the captioner was using the standard placement setting for Sportsnet hockey, which should have placed the captions at the bottom of the screen. Rogers' Master Control noticed when they moved to the top, but also noticed that it was not covering or impeding the scorebug so they decided to leave it there for the game.*

> *Rogers noted in its response that it was possible that the viewer's TV or BDU box shifted the captioning to a location which caused the scorebug to be covered. Rogers monitors its signals both as they leave the Master Control and, for comparison, on the services of BDUs. In monitoring its own signals, Rogers Master Control discovered that the Shaw Direct DSR 505 box always displays captions at the top of the screen, even when the captions are placed at the bottom of the screen by the captionist.*

65. It appears from the discoveries that are made in addressing the complaints that **the technology delivering closed captioning is not yet stable, uniform, and reliable throughout the broadcasting system**. It will get there, and it is already better than it was two years ago, but it is not perfect yet.

> *For example, complaints 563449 and 564214 were about the pre-recorded program "Bomb Girls". As it turned out, Bomb Girls had a unique problem in that the captioning data was inadvertently accompanied by a second stream of blank data. When some sets tried to display the blank data the real captions were removed from the screen so quickly they could not be read.*

> *The problem had not been caught by the producer, and took a long time to identify and address, because it did not happen on most television sets or monitoring devices – only on some; on a Sharp set, for example, but not a Samsung.*

> *In a similar case – not an official complaint – a broadcaster's employee was receiving captions on some, but not all, commercials. Master Control verified that captions were being sent accurately from the studio. It took many complaints to the BDU before a full investigation of their set-top boxes revealed that one model of PVR was in need of a software update. Once this was done across their system, the problem resolved.*

66. These complaints serve a real purpose in improving quality by identifying issues that can be addressed to improve the experience for caption viewers. While some complaints cannot be addressed at this time, such as the request for bilingual captions, and others are outside the broadcaster's power, such as complaints about US networks that come to Canadian broadcasters, others are very helpful in identifying issues for broadcasters so they can be communicated to the captioning providers and a solution found.

> *As Bell noted in case 592350-1, "Further to your letter regarding the placement of closed captioning on CTV British Columbia (CIVT-TV) on September 26th, 2012 at 6 p.m. during the program "CTV News", and our subsequent request for further information, I would like to thank you for clarifying specifically what your concern was. You had noted in the reply that the weather forecast (among other items) was covered by captions.*

> *"We reviewed the placement of our captioning, and agree that the placement of the captioning was at times an issue. We contacted the captioning company regarding this issue and we have reiterated to the captioning company that the closed captions should move around wherever*

possible, to avoid covering on screen graphics such as weather etc. In addition, CTV has requested that the captioning company reduce the number of lines from 3 to 2, thereby reducing the amount of on screen information that may inadvertently be covered."

67. Placement is an issue that continues to require exploration. The EBG notes that it takes time for a captioner to move captions around the screen, and this can add to lag-time or reduce accuracy. Solutions are often compromises – some viewers may not like the 2 line captions proposed above because each caption will appear on-screen for a shorter time, and of course placement is always an issue for weather reports, which are graphics-rich and involve a lot of movement. However, these solutions are worth trying as we seek to improve caption quality and experience.

SOME COMPLAINTS OF MISSING CAPTIONS ARISE FROM HUMAN ISSUES

68. The examples above should not be taken to indicate that all caption issues are the result of technical issues; there is a human element as well. Captioners make errors, like anyone else. Throughout broadcasting, on-air talent and technical staff seek to improve their performance daily, because errors take place. In offline captioning, errors can be caught and corrected; in live captioning, any problem is immediately visible.

> *Complaint 644218, for example, concerned the placement of captions, which had been correct up till 7 minutes remaining in a hockey game, when they suddenly shifted to the top of the screen.*
>
> *On investigating, Nathanail Captioning found that when the game ran long, the captioning assignment automatically switched to the person who was scheduled to caption the following program, a scheduling change that was itself caused by short-staffing due to sickness and vacations. The new captionist continued with the unexpected sports broadcast, but her equipment was set up to caption in the wrong place for the game – and she could not see the game where she lived due to blackouts.*
>
> *Nathanail noted in response: "I have talked to the scheduler and we will double check to make sure the game and post-game is assigned to the same captioner going forward. We also make every effort to ensure the person scheduled for a hockey game can view it and, with very few exceptions during an entire hockey season, I would say we are successful in doing this. We have addressed the placement issue with the captionist who took over the Canucks game on Monday and will send out a reminder on caption placement to the entire group."*
>
> *Rogers also noted that its Master Control failed to catch the switch in caption placement – the alert system does not catch such changes, since changes in placement are a normal part of operations.*

69. In the corrective actions for this example, Rogers noted that it must send an email to its staff to stress the importance of monitoring captioning, noting that future issues could result in disciplinary action, and also that it must hold vendors accountable for such mistakes, possibly adding this issue to a new Master Service Agreement. Clearly, all the parties involved take such issues very seriously, and do whatever they can to prevent recurrence.

PROGRESS ON VIEWER COMPLAINTS

70. The preceding narration of the issues surrounding missing and misplaced captions may seem extensive in a report about accuracy. We include it for two reasons:

a. First, most of the complaints received by broadcasters and the Commission have been about these issues, not about accuracy or even lag-time.

b. Second, since technical issues impact captioning quality, broadcasters have devoted considerable time to addressing them over the last two years. Not all of the problems are under broadcaster control, or even under the control of the captioning providers, but to the extent possible, they continue to be, addressed.

71. It is also useful to highlight that broadcasters have undertaken much work outside the complaints process, to ensure that quality is present for our viewers. In some cases, broadcasters have made significant efforts to adjust their practices to improve quality, as will be noted in the sections below, and in the appendices. In the last year, the number of issues on the technical side has dropped, likely as a result of technical staff finding solutions to some of these issues.

72. This mixture of human and technical errors has been the subject of continuing conversations with captioning providers, in the attempt to find answers.

73. For example, broadcasters now send as much information as possible to captioners in advance. Scripts are not usually available – on news programs these are being revised constantly, even while the program is on-air – but whatever information can be supplied to the captioner is supplied – a music rundown etc. And of course captioners themselves make use of web resources to obtain information – e.g. players' names in sports – that they can insert in their dictionaries. They may also check the station's website to familiarize themselves with the top news stories before a newscast.

74. EBG members have also adjusted their workflows to ensure that captioning issues are dealt with in the moment. All the EBG broadcasters have concentrated responsibility for issues like dropped captioning in their Master Control areas, where operators are aware of dropped captions, alerted to them, and can respond immediately on any technical issue.

75. Discussions with caption providers include fault reports when issues arise. Typically, Master Control fault reports indicate when there was communication and what the communication was between the station and the captioner. The providers also send daily and weekly fault reports to the broadcasters, which are invaluable in figuring out patterns of what went wrong. They are read by multiple individuals from both the technical and operational side.

WHAT THE EBG LEARNED FROM DISCUSSION WITH THE CAPTIONING PROVIDERS

76. Coming to the end of the first season of monitoring programs, while it seemed that some of the technical problems were being addressed, EBG members concluded that more needed to be done in concert with the captioning providers to improve accuracy.

77. Shaw noted that an approach to one caption company, suggesting brainstorming among all providers on ways to improve accuracy, had been met with the response that the providers were quite competitive, and that there was little history of networking among them.

78. Broadcasters continued to work on an individual basis with their providers. The following paragraphs are samples from Shaw's email correspondence, which they provided for this report. The correspondence has been edited to remove specific references, since some of these communications could have commercial implications.

79. These excerpts are typical of broadcaster-caption provider relationships in that they show initial pressure from the EBG to get captioning providers to achieve better scores – results of scoring or "audits" were communicated, with urges to find improvements.

> *Oct. 7, 2013: Here are the results from Oct 2013. As you can see, the number does not meet the expected CRTC formula's accuracy rate and we need to continue to search for solutions around ensuring that the captions are serving the needs of our caption consumers and also we need to continue to explore the possibility that there is a formula that will more accurately gauge and reflect the intelligibility of the captions for a show and one that takes into consideration the inherent challenges and limitations of live captioning.*
>
> *Hi, [deleted]:*
>
> *We have finished the live captioning accuracy reports for 2013. Please find attached the reports for [deleted]'s shows. The percentages were arrived at by a Shaw Media cc editor using the original formula set out by the CRTC while viewing the corresponding CRTC As-Run Logger. Looks like, for the sample taken, [deleted]'s average accuracy rate was 91%, slightly below the CRTC mandated level of 95%. Let's try to figure out how we can improve upon that number.*
>
> *For 2014, I will attempt to send you a monthly accuracy rate report so that in the event a show is under the 95% average, we can more quickly seek ways to address the quality. Our Shaw Media CC Editor who creates the reports is finishing November 2013, so I'll try to send you Sept to Nov 2013 this week and then send you Dec 2013 within the next few weeks.*
>
> *Let's see what we can do to meet the CRTC Accuracy rate and the needs of our caption viewers. We've made a good start by participating in the broadcaster meetings where we've been discussing the accuracy rate and the challenges thus far. Provider input at these meetings has been invaluable and much appreciated.*

80. These larger accuracy issue discussions took place within a stream of communication between caption providers and the broadcasters' captioning managers. Every week, the caption providers would send their list of faults or issues they had experienced in the hundreds of hours of programming that they captioned (this is outside of the complaints process noted earlier). As can be seen in one report, there is a mixture of issues:

Captioning morning news by iCap[2]. At 3:35a power went out, internet connection went out as well. Tried to dial in to phone lines, but all phone lines were down. Called Global Montreal control to tell them of the technical difficulties, called office at 3:37:30. Gave information. 3:41 power came on as did internet connection.
Around 9:37 I was kicked out of iCap. said that I was disconnected. so i waited a minute, exited the program, and then was able to successfully reconnect. Then around 9:47 the same thing happened. So I just jumped to the modem and audio line since I felt I had already missed enough captions. then it was fine the rest of the show.
my headphones battery died right at the start of the 10pm take. missed about 30 seconds.
I did the test ahead of time and everything was fine, I could hear the iCap audio. I dialled into the telephone audio line before the show just in case there was a problem with iCap's audio again. At one point while I was waiting for the news to start I could hear talking on the

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[2] iCap is a method of using the Internet to send program audio direct to the captionist's PC, and getting the captions back to the studio.

telephone line, but not on the iCap line, so I disconnected and reconnected to iCap and then was hearing talking on iCap as well. This was all before the show started. The audio packets were at 4 blue bars.
After the above happened, at the start of the show I was hearing the iCap audio, but no captions were coming up on the TV. The server status was saying no encoder. So I disconnected and connected again to iCap and then it worked fine.
another captioner dialed in and kicked me out of iCap at 1203. iCap then stopped responding, so i was unable to see who it was and had to restart iCap altogether. also experienced some audio outages in that first segment so went off the tv feed until it passed. [Deleted] did ask me about the 9:03 loss of captions and I already explained this to him as he said Calgary asked him directly about it. I also told him I'd report any iCap audio issues for the 4pm hour to him directly immediately after the hour
I tested fine with {deleted} at 8:50. At the top of the hour, I realized maybe I had no iCap audio, even tho my audio signal shows four full bars, so I dialled into the phone audio.
My power and then subsequent UPS backup went out at approximately 6:35 p.m. so I was without power. I called Sandy (office) to have her try to get someone else to jump onto Global while I got my generator up and running. At 6:44 p.m. I called Sandy to say I was ready to go again. She hadn't been able to find anyone to take over Global during that time, so the show was without captions for a period of time. I started captioning again at 6:44 p.m.
iCap stopped and was searching for relay -- got message saying it couldn't find it. kept trying and it came back on line
iCap stopped and said finding relay and then came online again

81. As can be seen, the adoption of new techniques for improvement, such as iCap, has not been smooth, so backup techniques remain necessary. But the report above indicates that accuracy was not the only problem being dealt with. Dropped captions was still the biggest issue – as noted in the section describing complaints.

82. However, accuracy issues continued to be the subject of discussion. As noted in the section on scoring, scores were not improving over the monitoring period. Shaw ultimately decided it must change caption providers for at least one program, to see if verbatim accuracy scores could be improved by the new company.

> *For the latest version of [deleted] we won't require [deleted]' s services. In light of the good relations we've enjoyed over the years … , I'd like to offer up an explanation. The CRTC's live accuracy mandate has been a tough one for us to fulfill through our external providers. … by trying a new provider for this show … we [are] … exploring other options to meet our obligations. We will be taking a close look at the new provider's accuracy levels as per the CRTC formula. Who knows? They might come in with similar numbers to our current live cc providers, which is just another bullet point in the argument that the accuracy level of 95% is not achievable, and that a lower percentage will still allow the viewer to enjoy and understand the programming.*

In response, the caption provider noted:

> *Thank you for your response and for your honesty in letting us know you will be going with a new provider for [deleted]. … We have always said that the formula that is used to make the grading calculation is just not realistic and I stand behind our point that our captions have not changed, the formula is what makes it completely unachievable. You know from past correspondence that when we grade using the captioning formula, we come up with a much higher rate than what is given with the CRTC formula. In addition to that, I have communicated with you the difficulties*

with the captioning of [deleted] [examples given] These are all things that you count as omissions/errors with doing your calculation.

Needless to say we are very disheartened by this and I can only tell you that if anything changes, we are always here to provide captioning services to you whenever you need.

83. The message coming to broadcasters consistently from the caption providers was very much the same as this correspondence – i.e. that good captioning was being provided, but it did not score well on the "verbatim test" formula.

84. In addition, the providers noted that attempts to get their captionists to provide verbatim transcripts did not help, and were counterproductive on many programs. The captionist would strive to provide verbatim, and gradually fall behind until lag time became unacceptable. They would then have to drop whole sentences to catch up to the audio. The result was a lower score – as every word in the missed sentence would be an error – and a poorer experience for the viewer as the meaning of the program was lost for that period.

THE AVAILABILITY OF CAPTIONISTS

85. As indicated above, broadcasters had recourse to the ultimate pressure – changing providers for a program. However, one must acknowledge that the results of that approach are doubtful, because of the human limits of the system. In captioning, there is a fundamental human resource issue: there simply are not enough people with the talent and stamina required to do this very demanding job.

86. The training for a television captioner begins with a two-year course. There is only one steno-captioning course currently accepting students in Canada – at the Northern Alberta Institute of Technology (NAIT) in Edmonton. It accepts about 27 people each year, but not all will make it to the second year, and approximately 20 will graduate.

87. After graduation, new captioners typically need considerable experience before they are capable of live television captioning. They may begin in some form of legal work, and may choose to remain there. Courtroom transcription via steno-captioning is not widely practised anymore (most courts use recordings) so a variety of private clients, depositions, and medical work make up the basis of a steno-captioner's work. Only a few find that they have the talent and the stress-hardiness to handle live captioning of television programs.

88. To be a successful in television captioning, captioners need to train themselves and their computerized dictionaries with keystroke combinations for about 100,000 words. As the Commission knows, captionists do not type words as such but use a combination of simultaneous keystrokes to create each word. While these start with a phonetic basis, each word must have a unique combination of keystrokes. In their training, captionists will learn a basic technique, but as they acquire experience, each captionist will develop their own keystroke combinations to encode the words they add to their dictionary. The result is that each captionist's gear has been heavily customized to their personal use.

89. In addition to this training and experience, considerable preparation goes into the captioning of any individual show. The captioning company, acting with the broadcaster, will provide "station sheets" for every program, which inform the captionist about such items as the preferred placement of captions for each element of the program (these may change for weather and sports and news) and the program structure, so they are not taken by surprise. Captionists must also enter the names of the on-air talent and any names likely to occur in the broadcast, into their dictionaries.

90. Preparation, as noted in the logs above, also includes testing of the connections and equipment to give the best chance of a smooth session. And then, once the session starts, the captionist must be "on" for an extended period. Captioners are certified using a five-minute text. Television captionists must manage the stress for an hour, usually, and longer on sports broadcasts. They do not caption during commercial breaks, but often must use these times to add words to their dictionaries that have arisen unexpectedly.

91. This is clearly demanding work, and not all are suited to it. The size of the talent pool in Canada is such that some of Canada's caption companies use captioners living abroad. There have been suggestions that broadcasters should have captioners in their studios – but they are simply not available to work in this way. No successful captioner will travel to a television studio to caption a one hour newscast, losing all of the work that might otherwise be offered to them. Even if they did, the working atmosphere in a television production environment contains many distractions which would not help to improve their accuracy.

92. Nor is it possible to always ensure that the best captioners are working on the most difficult programs. Caption companies make every effort to match captionists to programs, both in their interests and their abilities. And of course, they try to ensure that the same captioner stays with the same program as much as possible, since this ensures that the captionists' computer dictionaries – which are vital – are pre-loaded with the names and terms most likely to be used in the live broadcast.

93. But there are simply not enough captioners to ensure perfect matches all the time. As in any business, illness, vacation periods, and other exigencies must be accommodated. If a captioner proves unsatisfactory on one program, they may be moved to another better suited to their abilities and interests. In extreme cases, the captionist may lose their contract with that provider – though in such cases they may find work with another company – Canadian or American.

THE ALLOCATION OF BROADCASTER RESOURCES TO IMPROVING ACCURACY

94. Supplementing the reporting requirements of BRP 2012-362, the Commission's letter of September 19, 2014 notes that this "report should highlight in detail the actions taken by individual broadcasters to address issues related to the quality of closed captioning and what investments have been made in both personnel and infrastructure."

95. The body of this report deals in considerable detail with the collective efforts of broadcasters to deal with accuracy, loss of captions and caption placement. Because the letter specifies that investments should be detailed, each of the members of the EBG Working Group has also contributed an appendix to this report to detail those expenses and provide an individual prose narrative. And because those detailed expenditures constitute competitively-sensitive information, the EBG will file two versions of this report. For the complete version which includes the expenses, the EBG is requesting confidentiality. For the public version, only the expense information will be redacted.

96. In this section of the report, the EBG will summarize the appendices in order to show the general trend of activity.

OFF-LINE AND ON-LINE

97. Broadcasters have adjusted workflows to ensure that each programming gets the best possible captioning. In some cases, this has meant that programs that were live-captioned (online) have adjusted their workflows to permit earlier recording and off-line captioning before the live broadcast.

98. Some programs that cannot be fully captioned off-line can be recorded and captioned using on-line techniques just prior to broadcast. On rare occasions there is time to apply some corrections to these captions; but that is not typical. There isn't normally time to correct captions, but at least this technique helps prevent "dropped" captions since any connection issues between captioner and studio can be resolved.

99. The opposite has also been true: in one case, an in-house online captioning unit was disbanded because the captioning, which was done using voice-recognition, was not up to the accuracy required. The programs were then moved to steno-captioning from third-party providers.

100. In both these cases, moving between off-line and online, in-house and third party, involved significant expenses for the broadcasters in staffing costs.

TECHNICAL INVESTMENT

101. Throughout the broadcasting industry, the ongoing conversion to digital and high-definition has meant equipment replacement in all parts of the broadcast chain, and in some cases, this new equipment has not behaved as it should with closed captions, requiring adjustment, re-engineering and even replacement.

102. In addition, all broadcasters now monitor for the presence of closed captions and their placement. For live captioning, it is also important to monitor to ensure that connections with third-party captionists are reliable and solid. New equipment has been purchased by broadcasters to enable this monitoring effort, and many staff hours have also gone to maintaining quality and recovering from errors as soon as they occur.

103. Upgrading phone lines and other communications has also been a help in improving quality.

TRAINING

104. Both the new equipment and the new procedures have involved training efforts with the technical and program staff involved. While not always quantifiable in dollar terms, many hours have gone into the adoption of new gear and new procedures.

MONITORING AND SCORING

105. As noted above, the twice-monthly monitoring is a labour-intensive process, requiring up to eight hours of staff time to score a single half-hour. Since the requirement is two programs a month for each network carrying live programming, the overall effort is substantial. Where possible, this work is done in-house and the cost is staff time. However, as the Commission is aware, a number of broadcast groups have been obliged to downsize their staff resources during this period, and therefore the monitoring effort has, in some cases, been contracted out, and has become a dollar cost. For small stations, this effort can be an expense that cuts into program resources.

NEW ORGANIZATION AND WORKFLOWS

106. In general, broadcasters are concentrating the management of this activity in a captioning manager (under varying titles) within their operations group. This permits overall supervision of in-house and third-party resources and contracts. Such a person will be in close contact with the technical groups of that broadcaster and in some cases will be in the chain of communication when issues occur on live programming, to ensure a rapid response.

107. Often, there will be direct communication between a Master Control and the captioner concerned, in order to ensure rapid restoration of service. Naturally, broadcasters and captioning providers alike want to be in the loop for all issues so they can understand problems and correct procedures going forward.

Quality Control

108. Part of the new workflows has been the effort to create more rigorous quality control systems. These apply both at the intake of pre-recorded programming and the input/output of live programming, with all broadcasters' Master Controls looking both at the captions as they come in for presence and placement, and at their carriage on the outgoing feed and on selected BDUs to ensure they are getting through to the consumer.

109. In addition, broadcasters have engaged in accuracy and quality control with internal style guides, coaching of producers, and staff orientation to ensure that all parties involved realize that captioning quality now takes the same priority as audio or video quality.

Collective Efforts to Improve Accuracy Monitoring

110. Earlier sections of this Report have discussed the EBG's collective actions to improve the monitoring process. The following section provides details of the effort to find an improved formula for the measurement of accuracy. Altogether, the broadcasters met on these issues 21 times, and devoted many other hours to them, prior to efforts involved in assembling this Report.

- o   October 15 2012 (1 meeting)
- o   May 2013 (2)
- o   August (1)
- o   September (4)
- o   October (6)
- o   November (2) including meeting with CRTC Staff
- o   December (1)
- o   January 2014 (1)
- o   February (1)
- o   March (1)
- o   April (1)

Costs

111. As noted above, the individual detailed amounts expended by broadcasters are competitively sensitive both for them and the captioning providers. While we have not aggregated those costs here – differences in accounting practices makes it difficult to do a line-by-line addition – it is worth noting that the effort to improve captions appears to be a significant fraction (approximately one tenth) of the cost of captioning, which is itself approximately $30 million, a significant portion of production budgets.

112. The monitoring process itself also represents a real cost, though much of it is in staff time that is hard to quantify. In addition, the costs detailed in the appendices represent only the 5 members of the EBG, not the whole English-language broadcasting industry.

Alternatives to the Current Standards and Practices

Collective Work on an Alternative Objective Scoring Method

113. After a year of monitoring, broadcasters began to conclude that perhaps the standard wasn't achievable. This led to the broadcasters assembling in a Regulatory Working Group and an Operations Working Group to determine how to address the policy's goals and requirements. After much discussion, a common theme emerged: perhaps the "verbatim test" formula did not accurately reflect the overall accuracy and intelligibility

of a program. Still wanting to improve accuracy, and faced with the evidence that the verbatim test was not helping, the members of the EBG attempted to find an alternative scoring method.

114. Essentially, the strategy was the same as that adopted in BRP 2012-362, i.e. first, determine when captioning accuracy was insufficient through the application of a standard test, and then address the causes of inaccurate captioning with providers.

115. The difference was that the EBG hoped to be able to devise a test that would accurately measure accuracy, and not produce false negatives when captioners applied necessary paraphrasing. Armed with this information, they could find the root causes of inaccuracy and, working with the caption companies, address them.

116. They based the new test on a time-based formula, i.e. Accuracy Rate = (Total Length of Program in minutes) minus (Minutes of Program Where Meaning is Lost) divided by (Total Length of Program in minutes) multiplied by 100.

117. "Minutes of Program Where Meaning is Lost" meant time attributed to the portion of the program where the meaning of the spoken words was materially changed through errors such as word substitutions, word omissions, or word insertions.

118. The next step was developing a common understanding of how such a formula would be applied. The Working Group had already started discussions about identifying the various types of errors. The discussion then turned to how to determine which types of errors resulted in a loss of meaning/intelligibility versus those that did not and translating this common understanding into a set of guidelines that could be proposed alongside the time-based formula to ensure consistency in interpretation and application.

119. For example, options were discussed around how best to caption play-by-play commentary in sports programming. The question also arose as to whether this formula could assist with reaching the mandated 95% threshold consistently across all genres of live programming. This also led to a discussion about different accuracy rates for different genres of programming.

120. Between October, 2013 and April, 2014, four meetings of the Operations working group were held on this question, each meeting lasting no less than 3 hours per session. All meetings included representatives from Bell, CBC, Rogers and Shaw. Numerous emails and phone discussions also occurred during this time period. Prior to each meeting, various types of programming were selected and then monitored using the time-based formula. Results were then compared and discussed at the meetings.

121. Unfortunately, throughout the course of these meetings, the accuracy rates calculated by each of the broadcasters varied by up to 15% when calculating the time-based formula. The original goal had been to achieve a variance of no more than 5% by the end of the process. This was not achieved. In the earliest meetings, there was much discussion around what everyone thought was an error. Opinions and views differed on this, and a great deal of subjectivity became evident in the process. Because of the many ideas and opinions floating around the room, it was decided to bring in an expert: a former live captioner who currently runs a live captioning company.

122. Christina Ricci from Broadcast Captioning and Consulting Services (BCCS) provided much insight into the art of live captioning and what goes into the decision-making process of writing a caption. This helped the Operations Working Group to form a clearer idea about what would count as an error in a meaning-based system. She provided many examples of what is an omission or substitution. She also noted that live

captioners always strive for verbatim, but once the on-air speakers start talking too quickly, the captioners must then make intelligent decisions around how to most economically represent what is being said.

123. For example, maybe seven o'clock was said, but the captioner represented that as 7. Every time a live captioner has to fingerspell a word that isn't in their dictionary, it slows them down considerably. To make up for this loss of time, they make choices around how to represent the word on the second mention, (e.g. "Microsoft" is said the first time, which is finger-spelled, which requires multiple keystrokes, then the captioner writes "software company" upon successive mentions, which is an already existing macro in his/her system and is maybe one or two strokes).

124. At the April 3 meeting of the Operations Working Group, it was concluded that the time-based formula would not be pursued. Even though some guidelines were agreed, the process still tended to be far too subjective, with accuracy rate percentages differing widely for the same piece of content reviewed by several people.

125. The EBG was forced to conclude that it was not possible to apply a quantitative measure to accuracy if the relative meaning of paraphrases and verbatim transcripts was to be considered. Meaning is at the heart of the question: most people would agree that in some of the examples provided in this submission, the captioner has preserved and even clarified the meaning of the words spoken, because the verbatim rendering of ad-lib speech, with all its inflections, hesitations, and repetitions can be confusing in text form though clear to those hearing it. But applying a number to this kind of accuracy – a number that all would agree on – was not possible.

APPROACHES OF OTHER JURISDICTIONS: THE FCC'S RULES

126. Since the broadcasters in the EBG did not succeed in devising a more accurate test for accuracy, the next step was to look to other jurisdictions. In the years since BRP 2012-362 was issued, other countries have made rules on captioning quality, in particular, the Federal Communications Commission (FCC). Since so many programs broadcast in English Canada are captioned by their US producers under the FCC's rules, it seemed useful to see if their measures could provide some guidance.

127. On Feb 20, 2014, a "REPORT AND ORDER, DECLARATORY RULING, AND FURTHER NOTICE OF PROPOSED RULEMAKING, In the Matter of Closed Captioning of Video Programming" (FCC 14-12), was issued.

128. This is an extensive order. While it includes rulings on captioning accuracy, it also contains rulings and requests for comment on an array of issues that are not relevant to this report or to Canada generally – such as rules governing the use of Electronic Newsroom Techniques for captioning, which are not used here. This submission will deal solely with the accuracy required of broadcasters in live captioning.

OVERALL CONSIDERATIONS

129. The Order adopts captioning quality standards and technical compliance rules. It begins by commenting on the objective: to adopt rules within a general approach of flexibility and balance. It notes (¶ 1) Congress's clear goal that "*all Americans should ultimately have access to video programming*", and says,

> *To this end, we amend our rules and take other actions in a manner that provides flexibility on ways to achieve compliance, and effectively balances the impact that our actions will have on industry with the benefits that fully accessible programming can achieve for people who are deaf and hard of hearing.*

130. The Order adopts four non-technical quality standards and makes them the responsibility of video programming distributors (VPDs), a category that includes both broadcasters and BDUs[3]. Closed captioning by those who deliver video by Internet Protocol appears to be governed by separate regulation, though when captioning is required on IP-delivered programming, it must meet the same standards[4].

> *3. … We define four non-technical quality standards as the components necessary to ensure that closed captions provided by VPDs fully and effectively convey the content of television programming to people who cannot hear to the same extent that the audio track conveys this content to people who are able to hear:*

> - *Accuracy: To be accurate, captions must reflect the dialogue and other sounds and music in the audio track to the fullest extent possible based on the type of the programming, and must identify the speakers.*

> - *Synchronicity: In order to be synchronous, captions must coincide with their corresponding dialogue and other sounds to the fullest extent possible based on the type of the programming, and must appear at a speed that can be read by viewers.*

> - *Program Completeness: For a program's captions to be complete, they must run from the beginning to the end of the program, to the fullest extent possible, based on the type of the programming.*

> - *Placement: For proper placement, captions may not cover up other important on-screen information, such as character faces, featured text, graphics, or other information essential to the understanding or accessing of a program's content.*

131. These standards parallel those of CRTC BRP 2012-362, with some different terminology (lag time is called synchronicity), and with significant qualifications:

    a. The key standards are qualified by the phrase *"to the fullest extent possible, based on the type of the programming."* That is, they recognize that under some conditions, the ideal can't be achieved. This qualification reflects caption providers' view that while verbatim captioning is the ideal, it cannot always be done.

    b. BDUs share responsibility for achieving the standards

    c. The regulations are mandatory, but complaints are subject to a case-by-case determination of whether a violation occurred and what remedies are required. By contrast, in Canada, the parallel rules have the somewhat different status of Conditions of Licence, and regular monitoring is required.

132. In considering what constitutes "the fullest extent possible, based on the type of programming", ("types" include pre-recorded, live, and near-live) the FCC considers that determining the accuracy of live captions requires flexibility.

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[3] Among the references cited for this provision are:

47 C.F.R. § 79.1(a)(2) (defining a VPD as (1) any television broadcast station licensed by the Commission; (2) any multichannel video programming distributor (MVPD) as defined in Section 76.1000(e); and (3) any other distributor of video programming for residential reception that delivers such programming directly to the home and is subject to the jurisdiction of the Commission).

[4] The Order notes: "*See* 47 C.F.R. §§ 79.4(c)(1)(i) and (c)(2)(i); *IP Captioning Report and Order*, 27 FCC Rcd at 811-14, ¶¶ 36-39".

- *Live Programming: In evaluating a VPD's compliance with the captioning quality standards, the Commission **will consider the challenges in captioning live programming**, such as the lack of an opportunity to review and edit captions before the programming is aired on television. Notwithstanding these challenges, however, measures can be taken to ensure that captioning of live programming is **sufficiently accurate, synchronous, complete, and appropriately placed to allow a viewer who depends on captioning to understand the program and have a viewing experience that is comparable to someone listening to the sound track**.*

133. This wording sets a different objective for live captioning: while the aim for pre-recorded captions is to *"fully and effectively convey the content of television programming ...",* the aim for <u>live</u> programming is "*to understand the program and have a viewing experience that is <u>comparable</u> to someone listening to the sound track."* (emphasis added).

134. In other words, the objective that will be used by the FCC to judge accuracy in live captioning recognizes the impossibility of achieving the same "transcription" accuracy of captions on pre-recorded programming, where there is the opportunity to review the audio many times off-line before recording the captions.

BACKGROUND

135. The FCC's efforts to improve closed captioning quality began with a consumer group petition in 2004, and progressed through a series of proceedings, largely focused on the many technical problems that can impede the delivery of closed captions, and culminated in this proceeding, which finally addressed "*quality standards for non-technical aspects of closed captioning;"*

136. In this Order, the FCC noted that its initial reliance on voluntary, market-based measures to improve the accuracy of captions had not been successful. It noted a variety of consumer complaints. While many of these (and this is consistent with complaints received by Canadian broadcasters) are concerned with the loss of captions (usually reflecting a technical issue somewhere in the chain), a number have to do with misspelling and other non-technical inaccuracies.

137. Therefore the FCC proceeded to impose standards, citing its 1997 principle, "that captions must provide information substantially equivalent to that of the audio ...".

138. This was consistent with the submission of a coalition of Consumer Groups to the proceeding, which noted many mistakes in pre-recorded programming that affected comprehensibility, and requested:

> *... non-technical quality standards that will ensure that captions transmit information about the audio portion of the program that is "functionally equivalent to the information available through the program's soundtrack." (2004 Petition, ¶ 38)*

139. With respect to accuracy, the groups requested

- *There should be standards for proper spelling, grammar, timing, accuracy, and placement;*

- *Captions should be provided in the style that is appropriate for the particular type of programming that is being captioned;*

140. The EBG notes that the accuracy standard requested by American consumer groups stopped well short of word-for-word transcription of the audio track, and instead, focused on providing a "functionally equivalent" experience in a way that respects the nature of the programming.

141. In the Order, the FCC's definition of accuracy varies with the type of programming. It begins with word-for-word transcription of the dialogue in <u>recorded</u> programs, though it acknowledges this is not always possible.

> *28.   In order to be accurate, captions must match the spoken words in the dialogue, in their original language (English or Spanish), to the fullest extent possible.*

142. This general definition – which the FCC later qualifies for live programming - considers paraphrases or substitutions to be inaccuracies.[5] As noted in footnote 106, paraphrases change the experience for the captioning consumer:

> *If the captions paraphrase rather than present verbatim the dialogue of a dramatic or comedic performance, the viewer loses much of the impact of that performance. Accordingly, paraphrasing generally should not be used where the entirety of the dialogue can be conveyed through captions.*

143. But the FCC goes on to qualify this requirement by describing conditions that go beyond "the fullest extent possible".

> *Nevertheless, we understand that in certain circumstances, paraphrasing may be necessary to ensure that the intended audience can capture the content of the program. For example, at times, paraphrasing may be needed if time does not permit providing verbatim captions, such as when the time lag between when the dialogue occurs and the captions appear on live programming would prevent complete captioning of the program's audio content unless summarization occurs. (Footnote 106 in the Order)*

144. The FCC here acknowledges that a paraphrase can be necessary to allow understanding of the program content. Therefore, any attempt to <u>measure</u> accuracy by the FCC's standards, even for pre-recorded programming, cannot be completely objective. Some subjectivity will be required to determine whether the "necessary" summarizations are inaccuracies, or actually improvements to the experience of the caption consumer. This is also true of the FCC's non-verbal requirements – sound effects, and some identification of speakers. Because of this, as we see below, the FCC does not propose objective measurement of live captions on a scoring system.

145. Paraphrasing excluded, the FCC, like the CRTC, expects close to 100% verbatim accuracy on recorded programming, but it excludes *de minimis* errors from this requirement. It interprets "de minimis" flexibly for this purpose.

> *We intend to apply the de minimis standard in a flexible manner, consistent with our past approach, rather than specifying particular criteria that we will apply to make a de minimis determination. Specifically, in determining whether a failure to comply with the captioning quality standards is de minimis, we will*

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[5] Specifically, to accurately convey the dialogue in a program, closed captions need to contain all words in the order spoken, without paraphrasing or substituting words for proper names and places, contain proper spelling (including appropriate homophones, such as "their," not "there"), and provide, as needed to understand the program, appropriate punctuation and capitalization to reflect natural linguistic breaks and the flow of the dialogue, the proper tense, and the accurate representation of numbers (including currency figures with appropriate symbols or words). Accurate captions do not rewrite dialogue, or use synonyms to replace actual dialogue because this fails to capture the program's content and nuances. To this end, where necessary to understand a program's content, accurate captions also convey the manner and tone of the speaker's voice. Similarly, where slang or grammatical errors are intentionally used in a program's dialogue, accuracy dictates that captions mirror such slang and errors, so that viewers can fully understand the speaker's intent and message. Although we recognize that utterances (*e.g.,* "um") and false starts may not be as critical to a program's content, accuracy also requires that these be captioned if needed for the viewer to understand the program.

consider the particular circumstances presented, including the type of failure, the reason for the failure, whether the failure was one-time or continuing, the degree to which the program was understandable despite the errors, and the time frame within which corrective action was taken to prevent such failures from reoccurring. (¶35)

For example, with respect to accuracy, a de minimis error might be occasionally misspelled words that do not interfere with the ability to understand the program's content. (Footnote 149)

FCC Standards For Live Programming

146. The FCC, like the CRTC, varies its standards depending on whether the program is pre-recorded, live, or near-live.

147. While the CRTC maintains the same accuracy measurement system for all types, it varies the level of accuracy required. For pre-recorded programming, it is effectively 100% accuracy on the "verbatim test". For French live programming, 85% accuracy is required, and for English live programming, 95% accuracy is required.

148. For live programming, the FCC adopts a substantially different approach to accuracy. There is no attempt to measure accuracy against a verbatim transcript, nor do they attempt to hold broadcasters to a predetermined objective level of accuracy. In ¶ 67, the Order states:

In this regard, we note that this order rejects the need for the Commission to "identify clear metrics for determining the completeness, accuracy, readability, and synchronicity of programming."

149. It does believe that captioning providers, as a best practice, should have metrics to ensure they are meeting contractual obligations (¶ 62 and ¶ 63), but there is no regulation to this effect.

150. On the contrary, the FCC chooses to determine accuracy for live programming based on a case-by-case assessment that covers a number of factors:

42. … we recognize that it may be impossible, using today's technologies, to always achieve fully accurate captioning on live programming due to the particular constraints involved with captioning such programming. For this reason, in considering complaints concerning our captioning quality standards as they pertain to live programming, we will take into consideration the nature of this programming and the challenges associated with accurately captioning such programming. Our overall objective is to ensure that closed captions convey a program's content so that the program is fully accessible to viewers. To this end, whatever method is used to provide real-time captioning, we will address complaints by considering, on a case-by-case basis, the overall accuracy or understandability of the programming, the ability of the captions to convey the aural content of the program in a manner equivalent to the aural track, the extent to which the captioning errors prevented viewers from having access to the programming, and whether the VPD made best efforts to receive a certification from programmers that the programmer is either in compliance with the Commission's non-technical quality standards or with the Best Practices adopted herein, or is exempt from the captioning obligations. Our ultimate goal is to ensure better captioning quality without unduly burdening VPDs and programming providers. We believe that the approach we adopt strikes this balance.

151. To summarize the points relevant to this submission:

a. The FCC defines live caption accuracy without using a "verbatim test" or any "objective" accuracy measurement system. Instead, its test is whether the captions, "convey the aural content of the program in a manner equivalent to the aural track.", which requires subjective assessment.

b. The FCC's consideration of live program accuracy is complaints-driven, and is not the subject of continuous monitoring/scoring.

c. The redress of any failure to meet the standard is also determined on a case-by-case basis. (¶ 111)

SIGNIFICANCE OF THE FCC STANDARDS IN CANADA

152. It is worth noting that American programming constitutes a significant part of the English Canadian broadcast offering. This programming, whether offered on American stations imported into Canada by BDUs, or broadcast by Canadian licensees, has been and will be captioned to US standards. Only occasionally is a US program delivered in Canada with no captions, requiring the Canadian broadcaster to arrange for its captioning. For recorded programs, this makes little difference, as the standards are effectively the same.

153. However, the result of this situation is that English Canadian television consumers receive <u>live</u> programming whose captions are subject to different accuracy standards, either US programs which are not subject to a word-for-word percentage requirement, or English Canadian programming, which has a 95% "verbatim test" accuracy standard.

MOVING FORWARD

154. Over the past years, broadcasters have allocated significant time and resources to an effort to improve captioning quality, and have succeeded in many ways. They have experimented with new techniques, and have taken measures to resolve a number of technical issues that result in missing and misplaced captions, which – on the evidence of complaints received – are the largest concerns of caption consumers.

155. However, more needs to be done.

MEASURING AND IMPROVING ACCURACY

156. Within the effort to improve quality, the original strategy to improve accuracy, as adopted in BRP 2012-362, was to score live programs via a verbatim test on a regular basis and urge caption providers to improve their scores. Over the past two years, the members of the EBG have learned that:

a. Most programs did not and could not come close to the standard as described,

b. Scores did not improve, in spite of measurement and pressure from broadcasters and providers.

c. This occurred in large part because the "verbatim test" is not a true measure of accuracy. That is, while verbatim accuracy is the ideal, it is neither possible nor desirable in a number of real program situations. In fact, captionists are trained to paraphrase to aid comprehensibility. Therefore the test was not measuring accuracy as it is understood in the captioning profession.

d. The EBG's attempt to create a more accurate objective quantitative scoring system was not successful, because the comparison of meanings between audio and text – an essential element in determining caption quality – is inherently a subjective and non-quantitative judgment.

157. In the meantime, the American FCC produced its own rules on quality, which include accuracy. The EBG submits that those rules respond to the needs of captioning consumer and are based in the same understanding of accuracy as that of the captioning industry. They are also the rules that apply to almost all US programming broadcast in Canada.

158. The EBG therefore submits that, at least with respect to accuracy in live programming, it would be helpful to harmonize Canadian and US rules. The EBG submits that a similar understanding and process could be applied to Canadian live programs.

159. If our understanding and assessment of accuracy was put on a solid basis, then we could truly examine what improvements need to be made in the technology or in the human element and proceed to measures to address them.

THE EBG'S PROPOSALS

AN IMPROVED ASSESSMENT METHOD

160. The current process of scoring has not proved helpful in improving accuracy. With a new understanding of what constitutes quality with respect to accuracy, the EBG submits that monitoring should be based on that understanding.

161. Broadcasters would monitor two programs per group per month, but in place of the "verbatim test" they would conduct an assessment of the program based on the following criteria, which respond both to the FCC and industry understanding of quality, and to viewers' concerns as evidenced by complaints.

162. The assessors would ask, "To what extent is the program's captioning:
    a. lost or garbled?
    b. poorly positioned on the screen?
    c. Hard to understand, compared to the spoken audio?
    d. Conveying a different meaning than the program audio?

163. With the answers to these questions, the assessors would determine to what extent the captions "provide an equivalent experience" to the spoken word content of the program, and rate the program on a four-point quality scale, i.e.:
    a. excellent captioning
    b. good captioning
    c. acceptable captioning
    d. poor captioning

164. This assessment would be used in communication with the captioning provider, and remedial action would be undertaken on specific problem areas where necessary.

165. The biennial Report on broadcaster efforts to improve quality would continue to be a requirement.

MORE EXPERIMENTATION

166. The broadcasters in the EBG have tried various captioning techniques over the past years in an attempt to improve quality. At least one broadcaster within the EBG station groups began the test period using voice-recognition in combination with re-speakers. This is the technique used widely in French Canada, where it is apparently satisfactory, though the required percentage on verbatim accuracy is only 85% there, not 95%.

167. The initial practice fell well short of the English-Canadian standard, however. With current technology, voice recognition can still lead to such results as "Ovechkin" becoming in text, "of a chicken", which clearly does not preserve the meaning of the original. The result was that the broadcaster involved switched to steno-captioning, which was better, though still not up to the required 95%. Others tested the supplemental use of teleprompter and other newsroom-generated data but this also proved to be less than helpful and it is not in use.

168. If the members of the EBG were not occupied solely with meeting the verbatim test standard, they would be able to resume experimentation. Various developers have, and still do, "pitch" to broadcasters their latest improvements on technique. Some of these have been tried but not adopted or extensively explored, since it was clear they could not meet the 95% standard.

169. One EBG member is planning to take on a new provider that makes partial use of voice-recognition, to see what may happen. While steno-captioning is the superior method now, some form of voice recognition, or voice recognition with re-speaking or some unexplored form of human assist, may ultimately be the best solution. If free of the need to meet the verbatim test, broadcasters can engage with these entrepreneurs to develop their technologies.

170. In addition, other techniques – such as working with IT and telecom providers to get clearer and more reliable voice lines to captioners – might bring about improvements. There are still new technologies and techniques to explore.

THE ROLE OF THE BROADCASTING ACCESSIBILITY FUND

171. The broadcast year 2014-15 also marks the beginning of operations for the Broadcasting Accessibility Fund (BAF). The funding criteria within the Fund's mandate are not yet public, but members of the EBG believe that the criteria will accommodate initiatives that can improve the accuracy of closed captioning, since such improvements would clearly make broadcasting more accessible.

172. As soon as the BAF's funding criteria are made public, the EBG will begin discussions with the Fund's staff to see how best to proceed to encourage applications that would research and develop techniques to improve captioning, especially accuracy.

THE PROCESS FOR CHANGE

173. The EBG submits that within the regulatory system, it is necessary to move on the question of accuracy as soon as possible, since all English-language television licensees who carry any live programming are in non-compliance with their Conditions of Licence and very likely to remain so; the evidence demonstrates that the Condition of Licence with regard to accuracy of live programming cannot be met. The Commission noted in BRP 2012-362 that mandatory standards, by their very nature, should be achievable, measurable and enforceable. The accuracy standard is not achievable, so steps to change it must be undertaken.

174. The EBG further submits that the Commission can vary its policy with regard to captioning standards through an interpretation bulletin or an amendment to BRP 2012-362 that would permit, within the licence terms of the broadcast groups affected, movement to the system proposed above for the assessment of accuracy. This process can, of course, be open to public comment at the Commission's discretion.

175. All of which is respectfully submitted.

Bell Media's Investments in Improving Closed Captioning

Prior to and since the issuing of the Commission's quality standards for English-language closed captioning, Bell Media has implemented a number of operational initiatives and made significant investments in improving the quality of closed captioning through both personnel and infrastructure, to deliver high quality closed captioning on our stations and services to reach all of our audiences.

Capital Investments

Bell Media has made capital purchases including captioning software to complete all of our offline captioning that we are able to manage in-house, for pre-recorded programming and for live programming that is repeated after their premiere broadcasts. The software program converts text files to caption files, and facilitates the captioning process.

Our post sound departments are now equipped with video side audio suites to support captioning of HD video feeds. Our master controls are also set up to deliver HD programming with captioning.

Captioning Creation

All live captioning across Bell Media's stations and services is completed through third party suppliers. Bell Media currently uses two external captioning companies for live captioning and some off-line captioning of pre-recorded programming when the work load exceeds the capacity of our in-house staff.

To support the development of high quality captions through our suppliers to the extent possible, we now send them lyrics for programs containing music content prior to their broadcast on our stations and services, for example. We have also requested the same live captioners on the same programs whenever possible, as with greater experience and knowledge of the program and genre, and the development of a fuller captioning library, the captioner is better equipped to produce high quality and accurate captioning.

In house, we have also made great efforts to work towards higher quality captions throughout our programming and have considered all areas for improvement to our internal operations. As a result, we have revised our internal workflows to offline caption as much of the content as possible and fine-tune internal processes to reduce internal captioning errors, more effectively address captioning losses during live programs, and speed up response and trouble-shooting times when live captions are lost.

For our off-line captioning, we have split shows amongst many off-line captioners to complete the captioning within very short time periods, in order to achieve 100% for pre-recorded programming. All promotional and brand partnership material is captioned in the edit suite using

CPC software. The editor is responsible for compiling all of the scripted elements and transcribing any sound up elements.

We have also created an extensive *Captioning Style Guide* to ensure consistent captioning quality for all staff who work across the 11 suites involved.

<u>In-House Monitoring</u>

All pre-produced material is monitored for both HD and SD captioning at ingest. Uncaptioned material is rejected and will not be ingested into the on-air servers. Visual monitoring of captioning takes place at all critical points, and there is also electronic monitoring using Evertz Vistalink hardware on our transmission paths.

Promotional and local commercial content that is captioned in suite has a final quality check in Post Sound where we recently equipped the four suites with HD-SDI outputs and HD program monitors with caption display. After leaving post sound, elements are again checked in the ingest stage.

A selected number of live captioned programs airing on both conventional stations and specialty services are monitored daily for captioning accuracy and a monthly report is compiled. Six staff members perform this verification process and have taken on this work in addition to their usual functions.

<u>Ongoing Improvements</u>

Other initiatives to improve captioning include changing the telephone wiring at CIVT to enhance captioning transmissions and limit captioning losses that have been experienced during newscasts.

Our monitoring and compliance teams have had ongoing discussions with our captioning suppliers to address captioning quality issues including losses (largely due to captioners' modem technical difficulties), placement of captions, and scheduling of captioners. As a result of this work, we have made changes to our internal operational processes with respect to monitoring of captioning quality at various stages, making adjustments to Engineering hardware issues including replacing encoders when consistent issues arise, implementing a standard caption placement policy for field sports (hockey, soccer, football, etc.) to place captions at the bottom of the screen, and involving the Program Obligations department to investigate all captioning losses reported by Master Control, to understand the reasons for the loss and review resolutions taken to make improvements as necessary.

<u>Financial Investments</u>

Bell Media's financial investments to improve closed captioning in Broadcast years 2012-2013 and 2013-2014 are outlined below. These costs do not reflect staff time of those who perform captioning roles on top of other functions and software upgrades as part of the regular course of doing business.

	BY2012-13	BY2013-14
Equipment for monitoring	#	#
Staffing	#	#
CC suppliers	#	#
Total	#	#

Filed in confidence with the CRTC.

Closed Captioning Initiatives and Improvements

CBC

CBC is fully committed to the provision of quality in closed captioning. CBC has demonstrated this commitment for years prior to the release of the mandatory standards that took effect on Sept 1, 2012. CBC representatives participated in every stage of the English Language Closed Captioning Working Group beginning in 2008, including hosting many of the meetings, conference calls, and attending with both network management and operations representatives, each of 6 meetings of the smaller Working Group at the CRTC offices in Gatineau. We have taken this extremely seriously and have devoted a great deal of time, energy, and resources to it.

CBC invited representatives of Bell, Shaw and Rogers to our CBC Broadcasting Centre offices in October of 2012 to open a discussion of our shared experiences with the implementation of the new standards. It was evident at that time we were all very concerned about the accuracy standard. This began a concerted effort throughout 2013 and 2014 on the part of the broadcasters to propose a new accuracy standard that would more appropriately reflect the realities, limitations, and "real world" accuracy of live closed captioning, while trying to preserve the Commission's desire for objective measurement and demonstrated improvement.

At one point we were very hopeful that a time-based formula would prove to be a workable substitution for the current accuracy formula. CBC's Media Presentation managers and in-house captioning team participated in the subgroup on Operations devoting approximately 30 hours to meetings, testing and analysis of the current and the time-based formula. It became necessary to train new personnel to assist in the very time consuming monitoring exercise (approximately 8 hours per program), but to also assist with the Operations subgroup's work. The time-based formula was ultimately rejected by the group as the desired consistency in application was not evident due to inescapable subjectivity.

In parallel to this work, CBC has been in regular contact with our live closed captioning suppliers (the same companies that are providing the service to all the major broadcasters) to review results and reinforce the requirement for 95% accuracy while providing verbatim captions. Phone calls and meetings focused on ways in which we could improve results and in some cases, different captionists, or even companies, were assigned to different programs. We provide information in advance when it is possible (ie FIFA) and encourage caption companies to have captionists undertake any preparation possible to assure they will be ready for what they will hear in live programming (for example, viewing CBC.ca for names and places in news that has broken in advance of broadcasts).

CBC has also made significant investments in new workflows, technology and software for assurance of quality of closed captioning. We have engaged in discussions with alternate closed captioning technology suppliers to test new options in hope of finding ways to improve on the status quo. Closed captioning costs are very high, fully ¼ of all expenditures involved in Media Presentation of the CBC Network, CBC News Net, Documentary, and CBC.ca. Our Media Presentation management is emphatic with staff that closed captioning must be given the same level of priority as audio and video.

While CBC is making all efforts to assure the greatest accuracy possible, the accuracy of live closed captioning with the technology that exists today is ultimately dependent upon human performance. Human performance capacity is limited. Furthermore captionists are specifically trained to represent the

spoken word in the most representative way possible under circumstances that change moment to moment in live television.   That said, CBC remains committed to finding ways to improve accuracy.

The initiatives summarized below have occurred in the past 2 years with the implementation of the iTX automation system and the launch of the Media Presentation Centre, which delivers our programming to our audiences on all CBC television and radio channels.

- Quality control (QC) capacity upgraded through construction of additional viewing suite with new equipment dedicated to monitoring closed captioning.
- Upgraded 3 Softel closed captioning workstations with new hardware and software.
- Trained 2 additional in-house off-line captionists for re-captioning and error correction of live captioned programming.
- Testing new advancements in software for the capture and correction of closed captioning. Discussions with companies such as Nexidia could lead to faster correction of timing errors and text for quick repeat broadcasts of live captioned programs.
- Increased QC mechanisms, over three stages, to ensure each program's picture, sound, closed captioning are accurate:
    1. Intake of content goes through QC edit suites that have been equipped with state-of-the art closed captioning monitoring systems;
    2. Content preparation suites prepare programming for broadcast and are equipped to review all broadcast content for closed captioning; and
    3. A new workflow has been added. The day prior to actual broadcast, a dry-run on-screen play out of the full prime time schedule is reviewed.
- Individual CBC program production units have been requested to augment their production schedules for earlier delivery to the presentation department to ensure adequate time to create accurate closed captioning on pre-recorded programming.
- With the increased availability of inexpensive closed captioning off-line software, CBC representatives are "coaching" external production companies on the creation and delivery of programs with captioning embedded.
- CRTC Accuracy Evaluations: Each program takes on average a full shift (8 hours) to complete.
- Operations management and internal captionists' participation on the working group and in testing of different formulas
- Regulatory and management's working groups meetings.
- Ongoing discussions with closed captioning service providers to follow up on quality standards issues (including communications regarding our expectations for advanced preparation for live sports and news programming).

CBC Expenses for closed Captioning

The Accuracy Monitoring Process	cost of in-house staff time on monitoring (regular and overtime)	
Technical Improvements made to improve accuracy	Software licences and purchases (including penalties)	
	Hardware upgrades and new equipment needed for quality monitoring (alerts, etc.)	
	Engineering hours spent on new techniques for monitoring (converting pgm formats, etc.)	
Management and Staff time addressing quality issues	All Training, e.g. in monitoring and use of upgraded equipment	
	Value of time spent in Operations working group	
	Value of time spent in Regulatory working group	
	In-house off-line captioning expenses that replaced live 3rd party captioning	
Captioning expenses, base	In-house, base expenses	
	3rd Party	

ABRIDGED – Appendix C: Corus Individual Initiatives

CORUS' STRONG AND CONTINUED COMMITMENT TO ACHIEVING EXCELLENCE IN CLOSED CAPTIONING

Corus operates over 37 TV services in specialty and pay television networks including three over-the-air (OTA) television stations as CBC affiliates in three small markets in southern and eastern Ontario. Unlike most large group English Language Broadcasters, Corus' TV services are primarily specialty and pay services, which do not consist of live programming, but rather scripted, pre-produced and/or live-to-tape programming.

As noted above, our three OTA stations that do air live programming, CKWS-TV Kingston, CHEX-TV Peterborough and CHEX-TV–2 Oshawa are all affiliated to the CBC. As such Corus has primarily relied on the CBC network to do the accuracy rate monitoring given the relative small size of our live programming operations and the considerable financial costs that are associated with conducting the live closed captioning accuracy rate. However this should not be interpreted as a lack of commitment to achieve excellence in closed captioning. On the contrary, Corus' OTA stations have invested a considerable amount of time, capital costs and employee training to continuously improve the quality of its closed captioning and decrease related errors over the past two years. In fact, Corus' three OTA stations have spent over [redacted] since September 2013. In terms of success, the addition of a new monitoring hardware has yielded tremendous results. This new hardware now permits our Master Control operators to view and monitor all closed captioning as it is transmitted to all BDU's that retransmit our signal. This hardware as been instrumental in improving the work flow by allowing our staff to detect closed captioning errors prior to being aired. As a result, Corus OTA stations have not received any complaints relating to the quality of our closed captioning in the past two years.

As noted above, Corus' core television operations are pay and specialty services, which do not air live programming, but rather pre-produced and/or live-to-tape programming. Corus is proud to say that as of September 1st, 2014, we strive to be 100% on all of our English language services, for each broadcast day. This includes closed captioning of commercials. Furthermore, Corus has been extremely committed to achieving excellence in closed captioning since 2009, prior to the Quality standards for English-language Closed Captioning Policy, Commission issuing Broadcasting Regulatory Policy 2012-362, were approved in 2012. In fact, since Corus moved into its state-of-the art facility at Corus Quay in 2009, we have invested a significant amount of financial, technical and people resources in improving the quality of closed captioning for our television services. Most of Corus' closed captioning hardware and software costs were incurred in 2009-2012 [redacted]. Since September 2013 Corus has spent approximately [redacted] on closed captioning.

In the past two years, the team at Corus Quay has focused on improving its ingest tools to ensure that the viewer has a high quality viewing experience. These tools have significantly improved viewing for synchronization and accuracy of captions. Our ingest tools detect and correct the closed captioning display code issues, such as rectifying incorrect spacing issues, enabling our team at Corus Quay to oversee the quality control onsite. Another issue that our team has focused its efforts on is detecting missing closed captioning in Master Control. Corus ' Master Control now has a dashboard display itemizing any closed captioning missing at the time a scheduled is released (12 to 18 hours in advance) prior to the broadcast day to increase awareness and implement measures to ensure captioning is in place prior to air. If a show is not captioned, Corus has a policy in place which puts into action an escalation process to ensure that where possible, that programming is removed from the schedule prior to air. Another tool that has been added to master control is a visual and auditory alarm that rings where closed captioning is not detected during time of play within seconds. This allows operators to take appropriate measures promptly based upon the situation. Finally, Corus has been working closely with our 3rd party closed captioning

provider to continuously improve the quality and adhere to the CRTC's working group on Closed Captioning quality recommendations.

In conclusion, Corus has spent over [redacted] dollars in the past two years to continuously improve the quality of closed captioning for its viewers. We are, and will continue to be, strongly committed and dedicated to ensuring that our viewers experience an overall high quality viewing experience, which includes high quality closed captioning for all our services.

Appendix D: Rogers' Individual Initiatives

[ABRIDGED]

Rogers Media Inc. (Rogers) is continuously working to improve the quality of the closed captioning offered on our services. The following is a breakdown of the quantitative (expenditures) and qualitative measures we have taken to improve captioning quality and experience for our viewers since September 2012, following the release of Broadcasting Regulatory Policy 2012-362, *Quality standards for English-language closed captioning* (BRP 2012-362).

Quantitative Efforts to Improve Captioning since September 2012

Issue	Cost
Experimentation with Voice Recognition Technology	
Monitoring of Accuracy Rate	
Equipment	
Full-time Position Dedicated to Quality Closed Captioning in Prime Time Programming	

Issue	Hours
Time spent in Technical	100
Time spent in Operations	90
Time spent in Regulatory	150

Issue	Cost
Total third party captioning expenses	

Experimentation with Voice Recognition Technology

In 2013, Rogers purchased The Score Media Inc., which included specialty television channel The Score (now known as Sportsnet 360) and closed captioning service Voice 2 Visual Inc. (V2V). This service provided closed captioning for live and event programming using voice-recognition technology.

The V2V captioning software uses a method whereby a speaker watches live programming in an enclosed space and "re-speaks" the speech from the program. That speech would then appear as closed captions in the program. The software did not use the voices directly in the programs because it was tailored to the voices of specific speakers to increase accuracy.

The software relies on "vocabulary dictionaries," which are essentially voice databases created by individual speakers comprised of thousands of words. Speakers generated their vocabulary dictionaries by speaking words into the software in advance of closed captioning. It was particularly important for speakers to add any potentially new proper names because words that had not been added to their vocabulary dictionaries were generally misspelled. For example, Alexander Ovechkin appeared as "of a chicken" before it was added to an employee's vocabulary dictionary. While speakers were constantly updating their vocabulary dictionaries, it was virtually impossible to add every conceivable word that may appear in live broadcasts. This was especially true for news and sports where new and countless distinct proper names are introduced.

After using V2V captioning for five months, it became clear that this captioning technology was unable to meet the CRTC accuracy rate of 95% in live programming. In reaching this conclusion, we performed tests on fourteen different programs of various lengths from half-hour shows to four-hour sports games (for a total of 23.5 hours) to see if the accuracy of V2V captioning could be improved. This review included live sports games, news, and scripted dramas. Across these different genres, the testing produced an average accuracy rate of only 65%. The highest scores were obtained in programming where dialogue was slow, as it was easier to re-speak, and the volume and complexity of the words was low, making it easier for the technology to capture. This type of programming included poker programming (98%) and the scripted drama *General Hospital* (96%). Live sports, on the other hand, tested poorly with scores of 34%, 35%, 40%, and 49% due to the fast speech, overlapping dialogue, and different accents of announcers. All of these factors made it difficult for speakers to follow and understand the speech in live sports programming. In addition, speakers were constantly updating their vocabulary dictionaries but were unable to foresee all potential new words that would be used in live programming. Such mistakes could not be fixed in the context of a live broadcast.

Given that sports programming comprises the majority of our live programming, Rogers decided to shut down the V2V Captioning Department. It was not an efficient use of resources because this method of captioning was not improving the quality of captioning or meeting the CRTC standards. While poker programming and scripted dramas may have worked satisfactorily with the V2V captioning software, the same results could be obtained with steno-captioning. As a sports broadcaster, it was imperative that Rogers employed a method of closed captioning that would work best with live programming. Steno-captioning provides a significantly improved chance of meeting the 95% accuracy rate and so we continued to use this method of closed captioning for all of our live programming.

The operational costs for the V2V Captioning Department were approximately $. This total amount includes salaries for ten employees (approximately $ per month) and software payments (approximately $ per month).

The cost incurred in shutting down the V2V Captioning Department was approximately $. This total amount includes paying software licensing penalties of $as well as severance payments to personnel of $.

Monitoring of Accuracy Rate:

While Rogers has not hired additional employees to monitor and calculate the accuracy rate for two live programs per month, we are absorbing the additional work with existing staff by dropping other projects as well as paying overtime.

At the outset, Rogers was monitoring four shows per month to review whether or not we were able to meet the accuracy rate with our programs. Employees spend approximately 24 to 30 person hours every month to monitor the accuracy rate of these four programs. The time required to monitor a one-hour program varies from four to eight hours, depending upon the complexity of the program and the level of experience of the employee performing the monitoring.

The total amount spent to date to monitor the accuracy rate is $.

Equipment:

In 2013, Rogers identified through the review of our Weekly Captioning Fault Reports that there were a high number of disconnects on our phone lines between our master control facilities and captionists. These disconnects resulted in repeated disruptions to the closed captioning of live programs from just a few seconds to minutes at a time.

To provide some background on the process, for live captioning to appear on a television screen a captionist must dial into the Master Control Room of a television station using a standard phone line to provide them with access to the direct audio feed of a live broadcast. At the same time, using a laptop, the captionist must also dial into a closed caption encoder located at the station. The encoder embeds the captions sent from the captionist's laptop that appear on the television screen into the video.

When a captionist loses the audio or the captioning feed they immediately redial into the Master Control Room for the audio source or directly into the encoder. While both the captionist and Master Control Operator try to make the process as seamless as possible, it can take more than a minute to re-establish a connection and for the captions to reappear on the television screen.

Our Weekly Captioning Fault Reports indicated that the technology we were using in this process was occasionally malfunctioning, which resulted in the loss of captions during a live broadcast. In order to resolve this problem, we investigated alternative options to the process described above over the course of many months and with the assistance of equipment engineers and manufacturers as well as other broadcasters. Rogers also reached out to the North American Broadcasters Association Technical Committee to determine if there were technologies available that we were not aware of which would improve the reliability of the technology that enables closed captioning.

During the initial analysis it became apparent that our technical experts had to contend with a series of variables which included, but were not limited to, the following:

- The use of multiple closed captioning service providers;
- Complicated digital phone switches; and
- Different models of closed captioning encoders and audio couplers.

The difficulty with diagnosing the source of the problem was due to the random and unpredictable nature of the disconnects. We monitored hundreds of hours of live captioning without any disconnects; falsely leading our technical teams to believe the problem was somehow resolved. However, disconnects would inevitably reoccur, indicating that additional trouble shooting was required.

After a thorough analysis of our technical systems, we concluded that television stations that had their closed captioning encoders and program audio telephone couplers connected to VOIP switches suffered from a higher rate of disconnects. Stations that had their encoders and couplers connected to Plain Old Telephone Service (POTS) lines suffered from significantly less disconnects. As a result, we were able to determine that the source of the problem stemmed from the main VOIP switches.

In order to validate the conclusions drawn from our test results regarding POTS, we reached out to technical teams at other Canadian broadcasters. These discussions confirmed that many have their closed captioning equipment connected directly to a POTS line, bypassing their VOIP switches.

While reverting back to POTS appeared to be a solution to the systemic issue of disconnects, Rogers also investigated the latest method of delivery for closed captioning, which is entirely based on internet connectivity for both audio and data, to ensure that we had found the best solution. We tested the use of iCap, an internet-based technology which delivers live captioning via IP connection with an integrated low-latency audio feed, for a period of one month. Unfortunately, Rogers did not find any significant difference in reduced latency, reliability, or closed captioning accuracy rate. As well, Rogers and the captioning service providers found this system cumbersome and confusing, as it did not allow for last-minute changes such as adding new users or situations where a captionist had to switch to another computer.

Based on all of our considerations above, Rogers decided that the best solution to prevent disconnects was reverting to analog phone circuits for the audio couplers and closed captioning units. Accordingly, Rogers switched back to POTS analog phone lines on September 13, 2013. This switch has significantly improved the reliability of closed captioning as it has reduced the occurrence of disconnects. Rogers is pleased to report that we haven't received any complaints regarding the loss of closed captioning due to disconnects since we have switched back to POTS.

The total amount spent to date on these phone lines is approximately $.

Requests to captioning service providers to improve the accuracy rate:

Rogers has engaged in numerous discussions with our captioning service providers about ways to improve accuracy of closed captioning, particularly in live programming. The following items constitute measures undertaken with third party providers to improve captioning:

- **Spot checks**: Our captioning service providers perform spot checks to ensure that captionists are meeting the required standards as well as provide feedback to their employees in an effort to improve their captioning. We require that all of our captioning service providers review four Rogers' programs each month. As well, captioning service providers require their employees to perform "self-reviews" of their captioning to help monitor their accuracy rates.
- **Weekly Captioning Fault Reports:** We receive weekly Closed Captioning Fault Reports from our closed captioning service providers reflecting any and all issues they experience; most of which are technical in nature. This document is then distributed internally to management of both Programming and Master Control Operations. Both management teams then compare this report against our internal Closed Captioning Reports. We use these dual reports as a way of ensuring both ends of the captioning chain address incidents as they occur and to ensure that we are acting on and resolving all matters of concern with respect to captioning.
- **CRTC Complaints:** In our investigation of captioning issues from CRTC complaints, we routinely reach out to the captioning service provider in question to address problems with accuracy and quality of the impugned closed captions. The captioning service provider is able to provide key information regarding the challenges experienced by the particular captionist during the incident, if applicable. By informing the captioning service provider of these incidents, we are also inspired to think of ways to prevent further incidents from occurring.
- **Amended Contracts with Captioning Service Providers:** In an effort to improve the quality of closed captioning, we have amended our contracts with all of our captioning service providers to include clauses that:
  - captionists must always strive to provide captioning that meets the CRTC accuracy standards,
  - captionists who caption live sports programming must possess an in-depth knowledge of the sport they are captioning, and
  - captionists who caption live news programming must possess an in-depth knowledge of national and international news and current events.

  We requested the above amendments because captionists who are familiar with the programming content provide greater accuracy in their closed captioning.

English-Language Closed Captioning Working Group

Rogers has invested a considerable amount of time in discussions with the English-language Closed Captioning Working Group (EL-CCWG). The EL-CCWG is comprised of representatives from other English-language broadcasters, including Bell, Shaw, Corus, and the CBC, as well as captioning providers. Regulatory has spent a considerable amount of time in external meetings with the EL-CCWG. As well, Rogers has allocated an extensive periods on internal meetings to discuss how improvements can be made to our closed captioning service as well as our efforts in preparing this Report. We estimate that at

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least 100 person hours in Technical, 90 person hours in Operations, and 150 person hours in Regulatory have been spent on these efforts.

Full-time Position Dedicated to Quality Closed Captioning in Prime Time Programming

Since September 2012, Rogers has assigned a full-time employee to review all prime time/scripted shows prior to broadcast to ensure that the programs contain quality closed captioning. For instance, U.S. shows are typically delivered with closed captioning included, but it is still our responsibility to ensure that it is present, accurate, and meets the standards set by the CRTC.

The total amount spent to date on this employee is approximately $.

Rogers' Closed Captioning Monitoring Mechanism

Rogers created a monitoring mechanism for closed captioning in order to provide an effective and streamlined system for our On-air Operations Department. The "Closed Captioning Monitoring System" has been circulated with employees in On-air Operations and a copy is posted in all control rooms for ease of reference. This system is updated whenever improved measures are discovered, either due to improvements in operations or through our responses to complaints regarding closed captioning.

Closed Captioning Monitoring Mechanism

1. Monitoring:
Rogers receives programming either by direct satellite feed from a U.S. distributor or via tape which is couriered to our master control facilities. All closed captioning is monitored from the feeds that come into our facilities to the delivery to BDUs and OTA viewers. Programs delivered via tape are checked for quality. Our signals are also monitored for quality and consistency in master control by our operators during all broadcasts. This process includes monitoring the BDU's signal for quality and consistency as well.

2. Protocols regarding live programming with closed captioning supplier:
Our supplier receives a schedule of the events that need to be captioned approximately 7 days prior to broadcast.

The captionist assigned to provide the closed captioning must contact master control in order to confirm availability and correct operation of the live captioning lines and encoders, no later than 20 minutes prior to the time of broadcast.

All captionists are required to dial in to our phone couplers in order to listen to the program at source. This minimizes any delays that would be noticeable when captioning is performed via monitoring off a signal from a BDU.

The supplier provides a weekly fault report and conducts follow up reviews to correct any issues, whether technical or scheduling, before, during or after the telecast to which they were assigned.

3. Closed-captioning checklist:

The closed-captioning checklist details all protocols associated with the closed-captioning process and includes the following:

• Are test captions being displayed on the video at the output of the encoder?
• Are the captions being carried through the broadcast chain? For example, are captions visible on the broadcasting distribution returns?
• Is the captionist hearing the correct audio and is the audio clear?
• Has the closed captioning services provider been given the contact information for a backup encoder?
• Is the captioning covering the "score bug" or other relevant information? If so, is it necessary?

When problems occur, Master Control Operators will work directly with the captionist or their supervisor to resolve the issue and report the errors on the Fault Report.

4. Captioning Errors:

With respect to the correction of captioning errors, currently the process in place is to have programs recaptioned when errors occur. Master control has the authority to schedule recaptioning if a program is rescheduled for broadcast within a short period of time. If not, the captioning errors are noted on the fault system and the program will be recaptioned at a later date. As a matter of policy, a program is not rebroadcast until the captioning errors are corrected.

Summary of CRTC Complaints with respect to Closed Captioning

Table of Rogers' Closed Captioning Complaints from the CRTC (September 2012 – September 2014):

	Date	CRTC Case ID	Complainant	Type of program	Live	Issue
1	September and October, 2012	590487	William Hogan	All programming on Sportsnet	Both	Garbled captions
2	9/23/2013	591848	Henry Vlug	Sports (soccer)	Yes	Placement on screen
3	10/23/2012	595693	Jim Roots	Sports show (Sportsnet Connected)	Yes	Accuracy
4	February 4 and March 9, 2013	608003	Henry Vlug	Sports (hockey)	Yes	Placement on screen
5	3/12/2013	613167	Henry Vlug	Sports (hockey)	Yes	Missing captions
6	5/1/2013	619632	Chris Newman	Drama (Hannibal)	No	Flashing and too fast

7	5/18/2013	621306	Henry Vlug	Sports (hockey)	Yes	Missing captions
8	August 2 - 6, 2013	632264	Chris Newman	All programming on FX Canada	Both	Missing captions
9	10/27/2013	640486	Henry Vlug	Sports (hockey)	Yes	Placement on screen
10	11/26/2013	644218	Henry Vlug	Sports (hockey)	Yes	Placement on screen
11	4/24/2013	691630	Chris Newman	Drama (Hannibal)	No	Flashing and too fast
12	11/30/2013	644218-1	Henry Vlug	Sports (hockey)	Yes	Placement on screen
13	2/19/2014	652200-1	Kenneth Jones	Dramas (4 shows)	No	Missing captions

Rogers has received thirteen complaints about closed captioning through the CRTC from September 2012 to September 2014. While the Commission is in possession of the record of these complaints, we would like to take the opportunity to provide a brief review of how they were addressed. At times, these complaints exposed issues in our delivery of closed captioning which then allowed us to improve our systems in order to provide a better viewing experience for our viewers.

Of these thirteen complaints:
- five relate to the placement of captions on the television screen;
- four relate to missing captions;
- two relate to flashing and speed of captions;
- one relates to garbled captions; and
- one relates to accuracy of captions.

Placement of Captions on the Television Screen:

All five complaints regarding the placement of captions on the television screen were filed by Henry Vlug in reference to sports programming. In each instance, Mr. Vlug has expressed his preference for closed captioning to appear at the bottom of the screen (as opposed to the top) as he believes it is a superior placement. There is no specific requirement under CRTC policies for captions to be placed at the bottom of the screen:

- Item 6 in the Appendix to BRP 2012-362 reads as follows:
  - Positioning: For both live and pre-recorded captioning, captions must be positioned to avoid covering action, visual elements or any information required to understand the message.
  - Conflict between captions and on-screen information: If, despite the broadcaster's efforts, it is impossible to present captions without obstructing other graphic elements on screen (e.g. sports scores, weather data, breaking news), captions take precedence.
- The publication *Closed Captioning Standards and Protocol for Canadian English Language Television Programming Services* (the "Handbook") also addresses this issue:

- Page 12 of the Handbook addresses "On-screen Information". In particular, this section advises that a broadcaster should avoid covering graphics or keys, characters' eyes or lips, or areas of sports action with captions.
- Page 23 of the Handbook addresses "Presentation and Position of Captions". Here, the Handbook notes that real-time captions should appear in a three-line roll up format at the bottom of the screen except where the captions risk covering graphics, keys and other essential visual information, in which case the captions may be displayed in another location, in a two-line roll up.
- Page 26 of the Handbook addresses the captioning of "Sports" specifically. In this section the CAB emphasizes that care must be taken in positioning captions during a game; captions must be consistently placed; and captions must be positioned so as not to interfere with either the play or the graphics and keys.

Even though we are not required to place captions at the bottom of the screen, Rogers has been committed to meeting Mr. Vlug's preferences (while ensuring that the closed captions are not obstructing the action or other on-screen information) in order to provide the best viewing experience possible.

Missing Captions:

The complaints that Rogers has received regarding missing captions helped to trigger our switch from digital phone switches to POTS, as described in detail in the section of this Appendix entitled "Equipment." Overall improvements made as a result of these complaints have led to the establishment of stable technical systems for closed captioning and resolved our issues with dropped captions.

Flashing and Speed of Captions:

The two complaints that we received regarding flashing and speed of captions were investigated but our systems demonstrated that there were no issues as the captions appeared at a regular speed and were not flashing on screen. We also examined the programs through the Rogers digital cable box, but it also did not show any issues with the captions. Having satisfied ourselves that the problem was not originating on our end of the transmission, we suspect that it was due to other technical issues. There are numerous technical issues that may occur with captions unrelated to the broadcaster, including: a weak signal at consumer premises, weak signals from faulty amplifiers from the BDU, or technical problems with telephone service.

Garbled Captions:

We received one complaint regarding indecipherable captions over the course of two entire months. In response, we reviewed various programs that were broadcast within that time frame but at no time did we discover garbled captions. We advised the complainant to contact their television service provider to help resolve this issue as it was unrelated to the broadcaster (please refer to "Flashing and Speed of Captions" above for a list of potential issues).

Accuracy of Captions:

Upon receipt of a complaint about the accuracy of the captions provided for *Sportsnet Connected* in October 2012, we notified our captioning service provider that we must work to improve the accuracy rates for this program and the rates improved. We have not received any further complaints with respect to the accuracy of captions in our programming.

Conclusion

Rogers continues to look for new ways to increase the quality of the closed captioning in all of our programs, especially live and event programming, to better serve our viewers. We are committed to working with the industry, captioning providers, and consumers to advance the quality of captioning and our viewers' experience and enjoyment of television programming.

ABRIDGED – APPENDIX E: SHAW INDIVIDUAL INITIATIVES

Shaw Media efforts in implementing closed captioning quality standards from September 1, 2012 to August 31, 2014

Shaw Media has always been committed to providing quality captioning to our viewers. For the past two years, since the release of BRP CRTC 2012-362 *Quality standards for English-language closed captioning*, Shaw Media has applied significant time and resources to advancing captioning quality.

Meetings

Our time spent in external meetings with the English-Language Closed Captioning Working Group (EL-CCWG), comprised of representatives from other broadcasters and captioning providers, has amounted to over 50 hours each for 3-4 people. Internally, we have held extensive meetings involving several departments that could easily account for more than 150 person hours.

Shaw Media has also spent considerable time preparing for meetings with the Operations Working Group (OWG) in an effort to align broadcasters' interpretations of what constitutes an error and to seek alternative methodologies for measuring errors. The OWG developed a time based formula and applied it to nine pieces of content ranging in length from 30 minutes to three hours. Shaw Media's captioner spent approximately 100 hours analyzing the content of all nine shows – approximately 10 hours per show, with a three-hour soccer game taking at least 20 hours.

Captioning providers

Since September 2012, there have been ongoing conversations with our live captioning providers. Shaw Media regularly conducts meetings and phone calls with our captioning providers to discuss how to meet the new quality standards. These meetings occur approximately once per month. For example, on September 16, 2013 we met with NCC in Toronto to discuss their progress and provided them with their accuracy results for the previous year. NCC was surprised by some of these results since some of the lower marks were results from their best captioners. We asked that NCC go back to their staff to discuss the importance of the CRTC's quality standards and identify captioners who potentially required extra training. We have even changed captioning companies on certain shows in an effort to improve accuracy results.

The flow of communication between the captioning providers and the broadcasters has increased over the last two years. We receive daily and weekly fault reports from each of the providers which detail any issues encountered and the interaction between the captioning provider and the playout centre, all of which contribute to improving the accuracy of captioning.

Monitoring

The required monitoring of two programs per month for accuracy takes a substantial amount of time. We have one in-house captioning editor responsible for producing the live captioning accuracy monitoring reports. Over the past two years she has spent over 640 hours creating these reports. This is in addition to the 95 hours of monitoring that we had to contract out to a third-party captioner. Combined, this averages 7.6 hours per week spent solely on monitoring. This does not include the time spent creating copies of programs to monitor, shipping them from Master Control, or downloading and converting these discs into a format that can be read by our captioning software so that the in-house editor can monitor them.

New technologies

Shaw Media has tried some alternative technologies. For three months we worked with voice recognition software on pre-recorded programming with a view to eventually using it for live captioning as is done in Quebec. Unfortunately, because we could not achieve a 95% accuracy rate with the current definition, we could not use this technology for live captioning. Having the flexibility to work with and improve new technologies would provide us with another approach to increasing our captioning quality going forward.

We also experimented with a combination of live captioning and teleprompter conversion to captions, but there were issues with this method that likewise resulted in accuracy rates below the requirement.

We continue to look for new ways to increase the quality of captioning at Shaw Media, but the fact remains that automated technology is not yet able to reach the prescribed requirement and humans cannot live caption with 95% accuracy according to the current definition.

Costs

The Accuracy Monitoring Process

    monitoring reports prepared by third party

    cost of in-house staff time on monitoring (regular and overtime)

    cost of projects moved to 3rd party to free staff time for monitoring

    Cost of MC staff time preparing and couriering discs for monitoring

    Courier expenses

Technical Improvements made to improve accuracy

    Engineering hours spent on new techniques for monitoring (converting pgm formats, etc.)

Mangement and Staff time addressing quality issues

    All Training, e.g. in monitoring and use of upgraded equipment

    Value of time spent in Operations working group

    Value of time spent in Regulatory working group

Captioning expenses, base

    In-house, base expenses

    3rd Party