

**REPORT ON DIGITAL CLOSED CAPTIONING
INFORMAL COMPLAINTS: REVIEW AND ANALYSIS
MAY 2009 – MAY 2010**

PRESENTED TO:

**DIGITAL CLOSED CAPTIONING AND VIDEO DESCRIPTION
TECHNICAL WORKING GROUP**

**OFFICE OF ENGINEERING AND TECHNOLOGY
CONSUMER AND GOVERNMENTAL AFFAIRS BUREAU
FEDERAL COMMUNICATIONS COMMISSION**

OCTOBER 27, 2010

I. Summary

This report, presented to the Consumer Advisory Committee of the Federal Communications Commission (FCC or Commission), contains the findings of an in-depth review and analysis of closed captioning complaints received and addressed during the period from May 7, 2009 through May 7, 2010.¹ It provides, for the first time, a look at the closed captioning problems encountered by consumers, the responses to these complaints by video programming distributors (VPDs)² and the steps taken to remedy the technical problems raised in those complaints. Promoting accessible video programming for persons with hearing loss through closed captioning is a fundamental goal of Section 713 of the Communications Act. Closed captioning has played and will continue to play an essential role in ensuring accessible television viewing for all American consumers with hearing loss.

For the purposes of conducting this analysis, the engineers with the FCC Laboratory analyzed written responses from VPDs to approximately 107 complaints filed with the FCC against VPDs, including network broadcasters, cable, and satellite providers.³ These complaints reported various deficiencies associated with the provision of closed captions, including allegations about the lack of captions, the poor quality of captioning, delays in captioning displays, and equipment breakdowns or malfunctions. The analysis confirms that caption failures can occur at various points on the transmission path along which captions travel – from the origination source to the viewer. When captions do fail somewhere along the chain, viewers who rely on captions may be denied accessibility to, and enjoyment of, program content. The Commission’s rules require that

¹ Closed captioning is a technology that displays the audio portion of a television signal as printed words on the television screen. Captions may also identify speakers, sound effects, music, and laughter. Because closed captioning is hidden as encoded data transmitted within the television signal, the consumer can turn the captioning on or off.

² “Video programming distributor” is defined 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. 47 C.F.R. § 79.1(a)(2). MVPD is “an entity engaged in the business of making available for purchase, by subscribers or customers, multiple channels of video programming. Such entities include, but are not limited to, a cable operator, a BRS/EBS [Broadband Radio Service, formerly known as the Multipoint Distribution Service (MDS)/Multichannel Multipoint Distribution Service (MMDS) and Educational Broadband Service, formally known as the Instructional Television Fixed Service (ITFS)] provider, a direct broadcast satellite service, a television receive-only satellite program distributor, and a satellite master antenna television system operator, as well as buying groups or agents of all such entities.” 47 C.F.R. § 76.1000(e).

³ Where needed, in order to complete this analysis, the Commission conducted additional follow-up with the VPDs and sometimes the individual channels named in the complaint. As discussed below, the exact number of complaints is blurred because in some instances, complaints included multiple issues while in others, a VPD’s response responded to more than one complaint. *See n. 22 infra.*

closed captions reach viewers intact,⁴ and the analysis of the complaints examined herein raises concerns about how and the extent to which VPDs are proactively monitoring or otherwise ensuring that their viewing audiences are receiving complete and intact closed captions.

Causes of captioning complaints were revealed to be among the following:

- Delay due to real-time captioning
- Network or program source equipment
- Broadcaster equipment
- Cable or satellite company equipment
- VPD-supplied set-top-box (STB) or signal problem at consumer's residence
- Consumer (end user) equipment
- Program guide error, and
- Human error.

II. Digital Closed Captioning and Video Description Technical Working Group

In May of 2009, the Commission established the Digital Closed Captioning and Video Description Technical Working Group (Technical Working Group)⁵ to conduct an assessment of closed captioning and video description⁶ technical issues associated with the switch to digital television (DTV), and to recommend to the Commission's Consumer Advisory Committee (CAC)⁷ solutions to any technical problems arising with these services in conjunction with the DTV transition.⁸ The purpose of this group was to ensure that individuals who rely on closed captioning and video description were not cut off from access to emergency information and other televised materials when the DTV transition took place. The primary focus of the working group was to resolve technical problems with closed captions and video description, rather than address concerns related to policy and enforcement issues. More specifically, the group was charged with the following specific tasks:

⁴ 47 C.F.R. §79.1(c).

⁵ *FCC Announces Establishment of Technical Working Group to Study Digital Closed Captioning and Video Description Issues, Appointment of Members, Agenda for First Meeting*, Public Notice, DA 09-995 (May 1, 2009.) See http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-09-995A1.pdf.

⁶ Video description is a technology that inserts narrative verbal descriptions into the natural pauses of television programs to enhance television accessibility for blind and visually impaired persons.

⁷ The Commission established the CAC as a federal advisory committee in November 2000 for the purpose of making recommendations regarding consumer issues within the jurisdiction of the Commission and to facilitate the participation of consumers in proceedings before the Commission. See *FCC Requests Nominations for Membership on the Consumer/Disability Telecommunications Advisory Committee*, Public Notice, 15 FCC Red 23798 (CIB 2000). The Committee is now in its fifth term. See <http://www.fcc.gov/cgb/cac/>.

⁸ The CAC had recommended the establishment of this technical working group in comments submitted in MB Docket No. 07-148 (the FCC's *DTV Consumer Education Initiative*), on October 1, 2007, and again at CAC meetings held in June 2008 and January 2009.

- Identify current and anticipated problems with the transmission and display of digital closed captions and video description
- Evaluate the closed captioning and video description capabilities of digital equipment
- Develop solutions to ensure that closed captions and video description are passed through intact to consumers

In order to fulfill its functions, the Technical Working Group set up the following five subgroups:

- Data Needed for Assessing Problems with Closed Captioning
- Collection of Lessons Learned and Unsolved Mysteries
- Video Description Challenges and Issues
- Consumer Information and Needs
- HDMI and Video Sources

There were four meetings of the full Technical Working Group on the following dates: May 18, 2009; November 9, 2009; December 4, 2009, and February 19, 2010. In addition, there were numerous conference calls and in-person meetings held during the Working Group's tenure, some within the subgroups and some between subgroup chairs and Commission staff. The Working Group reported on its activities to the full CAC on two occasions: December 4, 2009 and June 30, 2010. Staff from the Commission's Consumer and Governmental Affairs Bureau (CGB) and the Office of Engineering and Technology (OET) provided technical support and guidance to the Working Group.

III. Closed Captioning

Section 713 of the Communications Act establishes that video programming must be accessible through the provision of closed captioning unless subject to one of the exemptions provided in the regulations.⁹ Commission regulations impose closed captioning obligations on all VPDs, regardless of distribution technology.¹⁰ For analog television, closed captioning is carried as encoded data transmitted within the vertical blanking interval (VBI) of the television signal which, "when decoded, provides a visual depiction of information simultaneously being presented on the aural channel (captions)."¹¹ In 1991, pursuant to the Television Decoder Circuitry Act of 1990,¹² the Commission adopted regulations requiring decoder circuitry to be built into all analog televisions with screens larger than thirteen inches when those televisions are manufactured or sold in the United States.¹³ Newly

⁹ 47 U.S.C. § 613; 47 C.F.R. § 79 *et. seq.* Closed captioning is the visual display of the audio portion of video programming pursuant to the technical specifications set forth in 47 C.F.R. Part 15. Section 713 was added to the Act by Section 305 of the Telecommunications Act of 1996, Pub. L. 104-104, 110 Stat. 56.

¹⁰ 47 C.F.R. § 79.1.

¹¹ 47 C.F.R. § 73.682(a)(22).

¹² Pub. L. No. 101-431, 104 Stat. 960 (1990) (codified at 47 U.S.C. §§ 303(u), 330(b)).

¹³ *Amendment of Part 15 of the Commission's Rules to Implement the Provisions of the Television Decoder Circuitry Act of 1990*, Report and Order, 6 FCC Rcd 2419 (1991), recon. granted in part, Memorandum Opinion

enacted federal legislation, the Twenty-first Century Communications and Video Accessibility Act (21st Century Act), signed into law on October 8, 2010, expands this mandate to video programming devices with picture screens of any size, if technically feasible.¹⁴

In 2000, the Commission adopted rules that specify technical standards for the reception and display of captioning on digital receivers.¹⁵ The 21st Century Act further directs that, as determined by schedules to be set by the Commission, programming previously aired on television with captions will have to be captioned when shown on the Internet.¹⁶

In 1997, the Commission adopted rules and implementation schedules for the provision of closed captioning.¹⁷ These rules required “video programming distributors” to provide an increasing number of hours of captioned programming over specified periods of time, depending on whether the programming is English or Spanish, and whether it is pre-rule (*i.e.*, older) or new programming.¹⁸ Currently, all nonexempt, new English and Spanish language programming must be captioned.¹⁹ As for pre-rule programming, currently 75 percent of nonexempt English language and 30 percent of nonexempt Spanish language programming per channel per quarter must be captioned.²⁰

IV. Analysis of Consumer Complaints

Through an inter-bureau collaboration, during the summer of 2010, OET and CGB conducted a review and analysis of informal closed captioning complaints and VPD responses to those complaints. Specifically, the engineers at the FCC Laboratory analyzed written responses by VPDs to 107 complaints involving closed captioning covering the period from May 7, 2009 through May 7, 2010.²¹ The goal of this exercise was to identify patterns of causes, along with solutions to closed captioning problems reported by consumers. In conducting this analysis, OET reviewed the responses sent in by VPDs in response to Notices of Informal Complaints (NOICs) sent out by the

and Order, 7 FCC Rcd 2279 (1992), codified at 47 C.F.R. § 15.119. *See also Permissible Uses of the Vertical Blanking Interval of Broadcast Television Signals*, Report and Order, 8 FCC Rcd 3613 (1993).

¹⁴ Pub. L. No. 111-260, § 203, amending 47 U.S.C. § 303(u).

¹⁵ *Closed Caption Decoder Requirements for Digital Television Receivers and Converter Boxes, Closed Captioning and Video Description of Video Programming, Implementation of Section 305 of the Telecommunications Act of 1996, Video Programming Accessibility*, ET Docket No. 99-254, MM Docket No. 95-176, Report and Order, 15 FCC Rcd 16788 (2000), codified at 47 C.F.R. § 15.122. The Commission established July 1, 2002, as the date that determines whether digital programming constitutes new or pre-rule programming. It adopted the same benchmark transition periods for new and pre-rule *digital* programming that existed for *analog* programming.

¹⁶ Pub. L. No. 111- 260, Sec 202(b).

¹⁷ *See Closed Captioning and Video Description of Video Programming, Implementation of Section 305 of the Telecommunications Act of 1996, Video Programming Accessibility*, MM Docket No. 95-176, Report and Order, 13 FCC Rcd 3272, 3276, at para. 7 (1997), *recon. granted in part*, Order on Reconsideration, 13 FCC Rcd 19973 (1998) (*Closed Captioning Reconsideration Order*).

¹⁸ 47 C.F.R. § 79.1(b).

¹⁹ 47 C.F.R. § 79.1(b)(1)(iv).

²⁰ 47 C.F.R. § 79.1(b)(2)(ii) and (b)(4)(i).

²¹ The official number of complaints received in this one year period was 104. However, four of these were omitted from the analysis due to lack of information. A fifth was omitted because the VPD’s response was combined with that for another complaint. Eight “extra” complaints were identified by subdividing five of the numbered complaints that dealt with multiple issues, for a total count of 107.

Commission.²² In some instances, the Commission sent back a Further Notice of Informal Complaint to the VPD, or routed a request for additional information to a different video provider in the transmission chain, in order to delve deeper into the technologies being used by the VPD (or consumer). This allowed OET to better identify the specific equipment used and to elicit a more in-depth report of the diagnosis and remedies applied by the VPDs.²³

The types of the complaints received are shown in Figure 1. The majority of complaints (57 percent) involved the complete absence of closed captions. Problems were also observed with captions being garbled or having dropped characters, words, or entire caption lines (30 percent), delayed (7 percent), or displayed too briefly (6 percent). It should be noted that complaints that identified multiple problems appear in more than one category of the pie-chart.

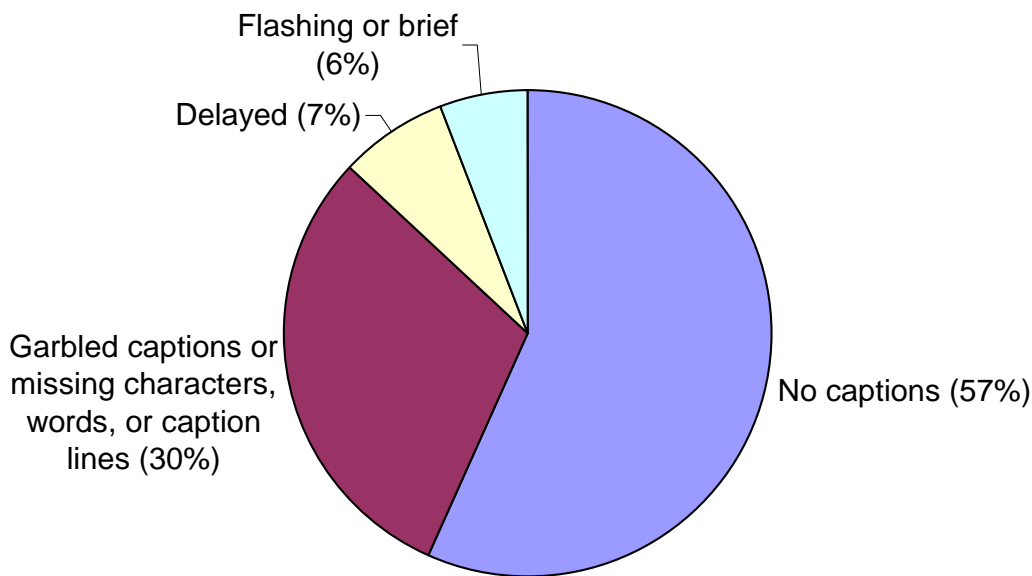


Figure 1. Captioning Complaints

1. Causes

Causes of the captioning problems, as identified by the VPDs, are shown in Figure 2. Beginning at the top of the chart and moving clockwise, the first two categories of complaints involved cases in which the original program was not captioned (11 percent) or exhibited “minor errors” in captioning (1 percent). There were two complaints of delays in real-time captions (2 percent) and of the associated loss of captions in the transitions from real-time captioned programming to commercials. Complaints were also attributed to equipment problems at the network or program source (3 percent), broadcaster (21 percent), or cable or satellite company (12 percent). Problems at the complainant’s residence were attributed to cable-company-supplied set-top boxes (17

²² Responses to NOICs are maintained in the FCC’s Consumer Complaint Management System (CCMS) under the system of records notice, FCC/CGB-1, Informal Complaints and Inquiries File (Broadcast, Common Carrier, and Wireless Telecommunications Bureau Radio Services). The Commission is authorized to request this information from consumers under 47 U.S.C. 206, 208, 301, 303, 309(e), 312, 362, 364, 386, 507, and 51; and 47 C.F.R. 1.711 *et seq.*

²³ See Appendix to this Report for some types and models of equipment reported.

percent), cable signal level (1 percent), consumer-owned equipment (4 percent), or consumer error (1 percent). Many of the responses did not identify the cause of the problem (29 percent).

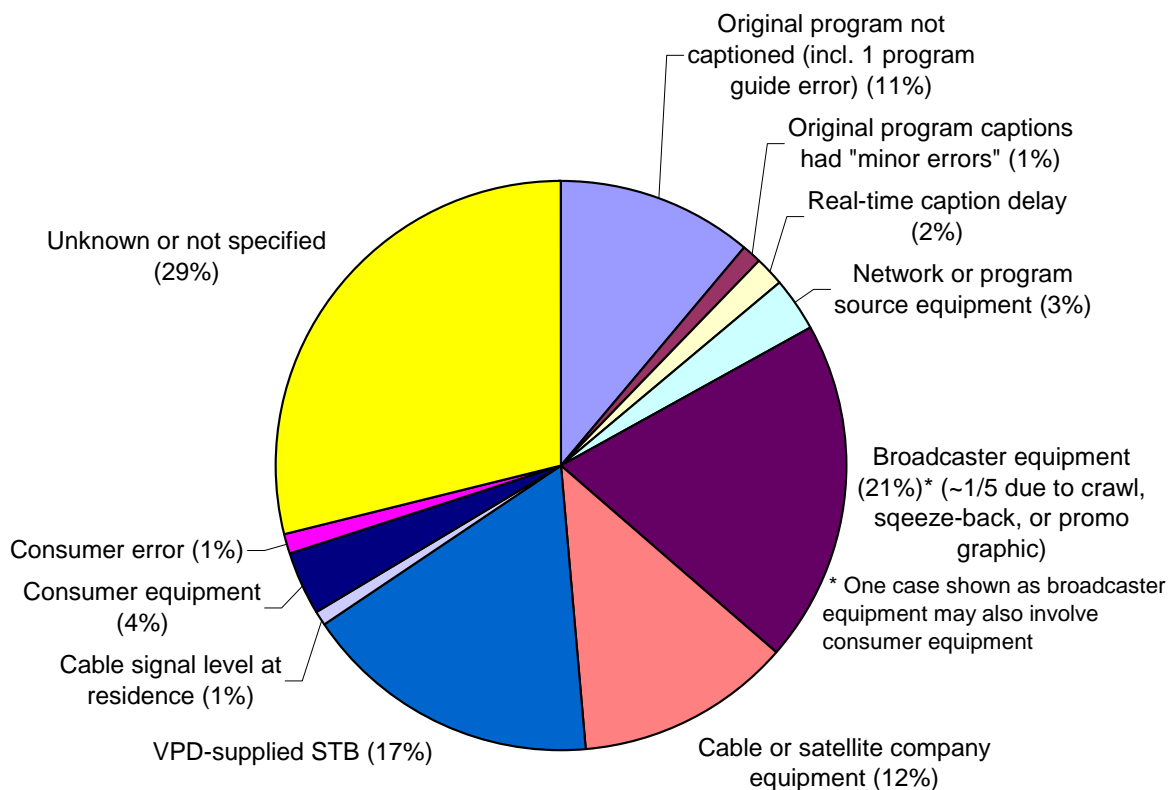


Figure 2. Causes of Captioning Problems

Of 37 problems that the VPDs attributed to issues at a VPD’s site (broadcaster, MVPD, network, other program source facility), 19 were attributed to specific units of equipment. Sixteen equipment brands were included in this attribution list – with only three of the brands appearing in the list twice. Two of duplicate mentions of equipment brands involved related complaints to the same VPD. (Two complaints to one VPD were attributed to one brand and model of equipment, and two to another VPD were attributed to another brand and model of equipment.) The other duplicate mention of an equipment brand involved two different types of equipment (a server and a frame sync) of the same brand that were identified as the causes of unrelated complaints. Thus, no patterns emerged in the brands or models of equipment to which the VPDs attributed captioning problems.

The problems that the VPDs attributed to issues at a VPD’s site (broadcaster, MVPD, network, other program source facility) included 29 that were specific enough to identify the *type* (though not necessarily the brand and model) of equipment or *functionality* that led to the problem. This number reduces to 27 after duplicate complaints are removed. These can be categorized as follows:

- Live captioning
 - ◊ Audio link to remote live captioner could not be established.
 - ◊ Phone data link from remote live captioner was noisy.

- ◇ Brief caption loss occurred during transitions between live event and commercials.
- ◇ Remote captioner failed to log off VANC processor, which resulted in blockage of all captions on the programs that followed (not discovered until the next day).
- News crawls, squeeze-backs, and promo graphics (These issues were generally solved by changes in equipment or signal routing.)
 - ◇ Captions lost or repositioned due to weather alert crawl.
 - ◇ Captions lost during squeeze back for election coverage.
 - ◇ Captions lost during 3-hour crawl showing election results.
 - ◇ Graphic promoting 10 pm news prevented pass through of captions.
- Video servers
 - ◇ Playout server for pay-per-view programming – Problem solved by upgrading software.
 - ◇ “Delay server” – Problem solved by upgrading software.
 - ◇ Video server problem. (Solution not described.)
- ATSC receiver/decoders
 - ◇ Problem solved by replacing receiver/decoder with different brand.
 - ◇ Problem solved by using direct fiber link from broadcaster to cable company
- ATSC/MPEG decoders
 - ◇ Problem solved by resetting decoder.
 - ◇ Problem solved by replacing card in decoder.
- ATSC/MPEG encoders
 - ◇ Problem solved by having manufacturer “rebuild” the encoder.
 - ◇ Problem solved by disconnecting input of the encoder and allowing the buffer to clear.
- Analog signal adjustments
 - ◇ Video level on analog to digital-on-fiber converter was misadjusted relative to blanking level; readjustment solved problem.
 - ◇ Timing error in equipment that converted from analog to SDI digital format caused caption data to be displaced to line 20. Since programs had been stored on server in this incorrect format, the VPD switched to an NTSC to ATSC caption transcoder that could adapt to the error.
- Satellite receivers
 - ◇ A timing error in the station's satellite receiver caused network programming to be out of sync by 1 video scan line—displacing captions from line 9 of the HD SDI signal.
 - ◇ “HD receiver” used by broadcaster. (Solution not described.)
- Caption encoders
 - ◇ Failed to go into bypass mode to pass network captions. Problem solved by replacing encoder.
- Miscellaneous equipment problems

- ◇ “Software malfunction” in splicer.
- ◇ “Software failure” in frame sync; solved by rebooting frame sync.
- ◇ Time base corrector was "intermittently glitching the video, causing CC to drop."
- ◇ SDI processor caused caption errors. Problem solved by removing SDI processor from signal path.
- ◇ Ethernet-to-RS232 interface device. Problem solved by replacing device.

Among the 18 complaints that were attributed to VPD-supplied set-top boxes, 16 were resolved by replacing the set-top box. In at least two of these cases the set-top box replacement (with a different brand) was intended as a temporary solution while the manufacturer of the original box developed a software upgrade to solve the problem. The remaining two complaints involved “intermittent flashing captions or no captions,” a problem that was attributed to a “correct, albeit uncommon method” that a network “was using to encode...captions.” To address the problem, the network began using “a different format to author its captions” while the set-top-box manufacturer worked on a software upgrade to address the problem.

Among the 4 complaints that were attributed to consumer equipment, the causes and solutions, as indicated in the VPD responses, were as follows:

- “...passive adapter to convert Component Video to S-Video...created a picture quality issue.” Upon removal of the adapter, “the picture quality cleared up at once and the closed captioning text became visible.” Complaint involved display of captions on a monitor using an external closed captioning device.
- “Technical issues” on one of the complainant’s satellite receivers caused problems “with the display of captioning on some channels.” The satellite company “believe[s] that the . . . issues . . . have been resolved through software updates to the receiver,” but complainant had already canceled service and received a waiver of the early termination fee.
- Complainant states that “[o]nce we disconnected the VCR/DVD player the captioning improved. . . .” (2 complaints by same party)

Additionally, in one case in which the broadcaster fixed a problem with scrolling captions by upgrading software on station equipment, the consumer still reported having problems with pop-on captions on some, but not all of his receivers, and said that it may be a “TV problem.” It is unclear whether this was a problem with consumer equipment or whether, for example, it was a problem with one of the caption streams (608 or 708) from the broadcaster and some of the consumer’s receivers were displaying 608 captions while others were displaying 708 captions.²⁴ (The broadcast engineer who responded to the complaint seemed unaware that there were two types of captions.) Finally, one complaint was attributed to failure of the complainant to enable closed captioning on his/her HD cable set-top box.

2. Resolution

²⁴ Some consumer reception equipment is capable of being set by the consumer to display either 608 or 708 captions. Other equipment may be capable of displaying only 608 captions or only 708 captions.

The disposition of the captioning complaints, based on responses by the VPDs, is summarized in Figure 3. In most cases, the results are based on the single initial response to each complaint and therefore may not represent the most recent status of the complaint.²⁵ Most of the complaints (61 percent) appeared to have been completely resolved. In two cases, the problem had been partially resolved (2 percent), and in a few others, resolution was underway (6 percent). In two cases, attempts to identify the problem were still underway (2 percent). In some cases, such as absence of captioning when captioning was not required or reasonable caption delays that were caused by real-time captioning, no resolution was required (13 percent). Some responses referred the complainant to another entity - a broadcaster, cable company, satellite company, or program provider (6 percent). A few cases were judged to be invalid or had been overtaken-by-events (4 percent); these included two complaints to a broadcaster located more than 1000 miles from the complainant’s residence (with no cable carriage of that broadcaster’s signal), and complaints by persons who were not customers of the VPD or who had dropped service by the VPD before the problem was resolved. There was insufficient information in seven percent of the responses to determine whether the complaint had been resolved.

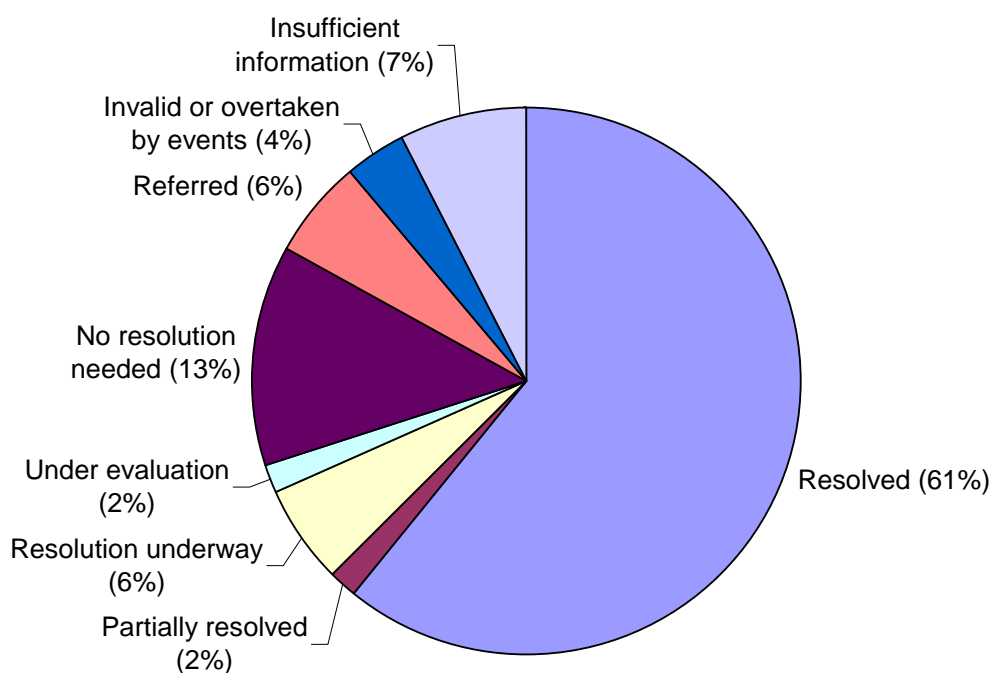


Figure 3. Caption Complaint Status

3. Observations from the Assessment

The assessment of VPD responses to consumer complaints led to the following observations:

Causes of Captioning Problems. No obvious patterns emerged regarding network, broadcaster, satellite, or cable company equipment (outside of the consumer’s home) that were identified as

²⁵ Results in 25 of the cases include a second response from the VPD that was intended to provide more specifics regarding the equipment that caused the problem or additional progress toward a solution.

causing captioning problems. Among the 19 responses that attributed a problem to a specific *brand and/or model* of equipment at a VPD, sixteen equipment brands were identified by VPDs as the cause of closed caption problems, but only one equipment brand was identified twice, except in related complaints to the same VPD. The case in which the same equipment brand was identified as the cause of two problems involved two different types of equipment.

Among 27 responses that attributed a captioning problem to a specific *type* of equipment or *functionality* (after elimination of two duplicate complaints), no single cause was dominant, but problems associated with live captioning and with news-crawls/squeeze-backs accounted for the largest numbers of problems (four each). Video servers accounted for three of the problems. ATSC receivers, MPEG decoders, MPEG encoders, satellite receivers, and analog video adjustments accounted for two complaints each. Six other equipment types were also identified as causes in one case each.

Among 76 cases in which at least the *location* of the captioning problem was identified, 18 problems were attributed to set-top boxes supplied by cable companies, four were attributed to consumer equipment, and one was attributed to consumer error.

Caption Monitoring. In a few of the reported cases, station personnel did not notice a loss of captions for many hours. As a result of some of the complaints, the VPDs reported plans to install new caption monitoring systems. Such monitoring systems included alarms for loss of captions or, in one case, a system that blocks the picture from in-station monitors if the captions are missing.

608 and 708 Captions. Very few of the responses distinguished between – or even mentioned – 608 and 708 captions. In one case in which the complainant discussed a problem with “digital captions” but said that the “analog captions” worked fine, the chief engineer at the broadcast station replied as follows:

“W...[call letters of station] broadcasts only a digital signal, and all captioning information is broadcast digitally, so I'm not clear on the distinction you make between analog and digital closed captions”

V. Conclusions

The analysis conducted by OET engineers revealed that the causes of captioning complaints are varied and that there were no obvious patterns in the technical problems that caused these complaints to be filed. In situations where captions were lost for extended periods of time, it would appear that captions received priority far lower than the picture or sound, as it is unlikely that loss of picture or sound would go unnoticed for hours. The availability of new caption monitoring systems that provide automatic alerts when captions disappear suggests possible new technological solutions for ensuring the presence of captions absent manual monitoring of all programs.

Where complainants reported that their captions worked well on some television sets but not on others, the cause may have been the failure to correctly deliver *both* the 608 and 708 captions. This is because the different TV sets may have been looking at different caption data. The general failure of VPDs to distinguish between caption types suggests that VPD personnel need to be made aware that two types of closed caption data can be carried in broadcast and cable DTV signals, and that both types are required. When a captioning complaint is brought, it would be useful for the VPD to have both types tested.

APPENDIX A

Sampling of VPD Causes of Closed Caption Failures

General Cause	Specific Cause	Disposition
Broadcaster equipment	Live captioner connection.	Backup captioning service in another state began providing captions within 15 minutes. Subsequently, a dedicated connection for captioners was installed along with caption monitors at the broadcaster.
Broadcaster equipment	Backup captioner failed to log-off properly from station's encoder box--thus blocking captions for subsequent programming.	Operator performed reset on caption encoder the next morning, fixing the problem.
Broadcaster equipment	Analog video signal level was incorrect relative to blanking level--possibly due to equipment move.	Analog video was adjusted to the proper level.
Broadcaster equipment	Software failure on frame sync caused loss of captions.	Reboot of frame sync (executed by re-energizing the power supply) solved the problem.
Broadcaster equipment	Timing error in converter (that received program from satellite in analog format and converted to SD digital) displaced the captions to line 20; server stored the program and upconverted to 1080i, but couldn't adapt to the line-20 captioning.	Added transcoder to convert the captions in the SD signal from server, then recombined captions with upconverted video using an encoder.
Broadcaster equipment	An SDI processor caused the ATSC encoder to be intermittent. HD encoders would randomly lock out CC and require a reboot; Time Based Correctors "were intermittently glitching the video and causing CC to drop"; the HD video server for network programming was causing CC to drop for 10-15 sec every few minutes; "HD playout server drops CC when we play 720p content out at 1080i."	Removed the SDI processor from the signal path. Various other problems solved; added monitors so master control dept can see CC data around the clock.

Broadcaster equipment	ATSC encoder "manufacturer discovered underlying memory issues that had not been deleted earlier despite dozens of attempts to upgrade the encoders' software. The extraneous data in the digital encoder may have affected the station's captioning stream." Also, possible corruption of phone connection used by live captioner.	Manufacturer rebuilt the ATSC encoder, in the process discovering and resolving "underlying memory issues that had not been deleted." Planned improvements: ordered device to correct captioning problems; ordered device to allow captioner to interact w/station over Internet rather than phone lines.
Broadcaster equipment	Switcher that was used to combine HD network feed with graphic from character generator promoting 10 pm news was stripping out the CC data when the promo graphic was displayed by the character generator.	Station ceased to use the promo until card used to supply the graphics was replaced. Reconfigured equipment based on guidance from switcher manufacturer website.
Broadcaster equipment	"Software malfunction" in splicer using processor or "conflict between the ... splicer and other station equipment"	Malfunction repaired
Cable company equipment	MPEG2 encoder that was connected to the output of a commercial satellite receiver.	Content provider disconnected the input of the MPEG2 encoder from the commercial satellite receiver, allowed the encoder buffer to clear, then reconnected; problem went away.
Cable company equipment	MPEG decoder / NTSC modulator	Replaced card in decoder/modulator
Satellite company equipment	Decoder	Reset the decoder
Satellite company equipment	Playout server manufacturer identified a "technical issue" with its software for the playout server used to deliver pay-per-view content via satellites.	New software appears to solve the problem, but "other aspects of the new software need to be further modified to stably integrate with our system." Work continues.

APPENDIX B

Revised Closed Captioning Complaint Processes and Procedures

The Consumer and Governmental Affairs Bureau's Disability Rights Office (DRO) receives and processes informal complaints addressing closed captioning issues. After new rules became effective on February 19, 2010, DRO revised its processes and procedures for handling closed captioning complaints.²⁶ One major change in the new rules is that consumers no longer have to contact a VPD before filing a complaint with the FCC.

The FCC now has an online registry of video programming distributors (VPDs) that consumers and the FCC can use to identify persons specifically designated by each VPD as the contact person for closed captioning complaints. Every VPD is required to submit this information to the VPD registry at the FCC. Consumers wishing to contact their VPDs about closed captioning concerns and complaints may find their VPD by searching an FCC webpage dedicated to this contact information.²⁷ These changes to the captioning complaint processes have made it easier for consumers to bring their complaints either to their VPDs or directly to the Commission, and have resulted in an increase in the number of closed captioning complaints received by the Commission over the past several months.

In addition to making the above regulatory changes, since the spring of 2010, DRO has revised its internal procedures for handling informal closed captioning complaints to better ensure a resolution of the problems raised by consumers. For example, improved efforts are now made to keep consumers informed about the receipt of their complaints by the Commission, as well as proposed resolutions by VPDs, so that DRO may better determine consumer satisfaction with these proposed resolutions. In those cases where either information received by VPDs is not sufficient to assess the problem at hand, or unresolved issues remain, DRO's Telecommunications Accessibility Specialists also make greater efforts to re-contact the VPD to acquire further details. Finally, in those instances in which a VPD claims an exemption under our rules (*e.g.*, local non-repeat programming, new network, etc.), the Commission may ask for documentation for the exemption asserted.²⁸

²⁶ See *Closed Captioning of Video Programming, Closed Captioning Requirements for Digital Television Receivers*, CG Docket 05-231 and ET Docket 99-254, Declaratory Ruling, Order, and Notice of Proposed Rulemaking, 23 FCC Rcd 16674 (2008) (*November 2008 Order*). In the *November 2008 Order*, the Commission revised its rules governing closed captioning complaint procedures by substantially amending section 79.1(g). A new FCC Closed Captioning Factsheet provides an explanation of the revised complaint process at: <http://www.fcc.gov/cgb/consumerfacts/closedcaption.html>.

²⁷ See <http://esupport.fcc.gov/vpd-search/search.action>.

²⁸ While the Commission generally follows the procedures described above, it retains the discretion to depart from these internal procedures for handling complaints in individual cases or as the need arises.