



From liftoff to landing: NASA's crisis communications and resulting media coverage following the *Challenger* and *Columbia* tragedies

Ryan M. Martin^a, Lois A. Boynton^{b,*}

^a *University of Cincinnati College of Law, Cincinnati, OH, USA*

^b *College of Journalism and Mass Communication, University of North Carolina at Chapel Hill, NC 27599-3365, USA*

Received 3 September 2004; received in revised form 25 January 2005; accepted 1 February 2005

Abstract

NASA's public relations effort following the explosion of the *Challenger* in 1986 is considered an example of crisis communications failure. After the *Columbia* disaster in 2003, NASA was praised for its successful handling of the crisis. This paper identifies how four newspapers presented NASA's crisis communication efforts following the two crises, utilizing widely accepted crisis communication concepts associated with stakeholder theory. Results showed that the print media reported that NASA followed specific communicative practices and accorded NASA more positive coverage following the *Columbia* disaster than the *Challenger* disaster.

© 2005 Elsevier Inc. All rights reserved.

Keywords: Crisis communication; Stakeholder theory; NASA; Columbia; Challenger

1. Introduction

At 11:38 a.m. EST on January 28, 1986, the space shuttle *Challenger* launched skyward beginning its tenth mission into outer space. The flight had been delayed for 3 days because of poor weather, and NASA officials eagerly watched as the shuttle finally got off the ground. Then, the unthinkable occurred. Approximately 73 seconds and 10 miles after takeoff, the spacecraft suddenly exploded leaving only two

* Corresponding author. Tel.: +1 919 843 8342; fax: +1 919 962 0620.

E-mail address: lboynton@email.unc.edu (L.A. Boynton).

white lines of smoke racing through the air. All seven passengers on board were killed (Broad, 1986). The *Challenger* explosion, although not the first NASA mission resulting in loss of life, was the most horrific event in the history of the United States space program—until it happened again.

On February 1, 2003, 17 years after NASA lost the crew aboard *Challenger*, the agency experienced yet another crisis of tragic proportions. The space shuttle *Columbia*, as it was traveling at 12,500 miles per hour 40 miles above the earth's surface, blew apart as it attempted to re-enter the atmosphere at approximately 9 a.m. EST. Once again, all seven astronauts on the mission lost their lives (Sanger, 2003a).

Immediately following each of these horrific events, NASA officials faced many of the same public relations problems. Questions were coming in at warp speed, answers were scarce, accusations were flying, rumors spread like wildfire, and everyone wanted answers—now. How NASA communicated in the minutes, hours, and days following each event would be key to how the agency's publics would react. This, however, is where crisis communications experts would say the similarities ended (Baron, 2003; Dickey, 2003; Gustin & Sheehy, 2003; Marshall, 1986).

NASA's public relations effort following the explosion of the space shuttle *Challenger* is widely considered a textbook example of a crisis communications failure (Marshall, 1986). After the *Columbia* disaster, however, NASA public affairs officials received praise as well as criticism for a more successful handling of the crisis (Cabbage & Harwood, 2004; Columbia Accident Investigation Board, 2003; Joint Hearing, 2003). U.S. Senator John McCain, speaking before the Subcommittee on Space and Aeronautics, said on February 12, 2003, "Many have noted the vast improvement of the release of information, as compared to the *Challenger* tragedy of 1986" (Joint Hearing, 2003). Therefore, it would seem to follow that the media coverage NASA received after the *Columbia* tragedy would be more positive than the coverage of NASA after the *Challenger* disaster. But is this really the case? This study identifies how the print media presented the crisis communication efforts of NASA following the agency's two largest crises, utilizing widely accepted crisis communication concepts, specifically, stakeholder theory (Ulmer & Sellnow, 2000).¹

2. Method

A quantitative content analysis was conducted to analyze the extent to which news stories following *Challenger* and *Columbia* contained evidence of five criteria for successful crisis communications with stakeholders through the media: (1) prompt response (Barnett, 2003; Ogrizek & Gullery, 1999; Umansky, 2001), (2) truth/avoidance of absolutes (Duke & Masland, 2002; Stanton, 2002), (3) constant flow of information (Gaschen, 2003; Geibel, 1996), (4) concern for victims and their families (Coombs, 1999; Zerman, 1995), and (5) choice of appropriate spokesperson(s) (Gustin & Sheehy, 2003; Horsley & Barker, 2002).

¹ Most experts advocate holistic public relations efforts aimed at anticipating crises, planning for crises, communicating during crises, and identifying those affected by crisis situations (Horsley & Barker, 2002). Crisis communication theories have advanced from reactive approaches such as apologia (Coombs, 1998; Hearit, 1994; Ihlen, 2002; Ware & Linkugel, 1973), image repair theory (Benoit, 1997), neoinstitutionalism and attribution theories (Coombs & Holladay, 1996), to more proactive methods such as the symbolic approach (Coombs, 1998). The central focus of crisis communication now expands the emphasis on the organization's needs to also include how publics are affected by an organization's actions. Stakeholder theory postulates that organizations that want to survive crises must maintain positive relationships with their stakeholders, including news media, stockholders, consumers, workers, suppliers, creditors, competitors, professional groups, government agencies, and the community (Ulmer & Sellnow, 2000).

Two hypotheses were proposed: First, the criteria for successful crisis communication will appear more frequently in newspaper stories about the *Columbia* explosion than newspaper stories about the *Challenger* explosion. Second, NASA would have received more positive news coverage following *Columbia* than it received following *Challenger*.

A list of adjectives and descriptions used to describe NASA, the *Challenger* and *Columbia* tragedies, and NASA's handling of the crises were created to describe the tone of coverage following each disaster. The sample was derived from stories contained in four American newspapers. To be selected for the project, newspapers had to have been in operation during both the *Challenger* and *Columbia* tragedies, be large enough to produce multiple in-house stories directly following the *Challenger* and *Columbia* tragedies, have their own science or technology section, and have their own correspondents reporting from NASA headquarters.

Using these criteria, the following newspapers were selected. *The New York Times* contains a large science section with numerous NASA correspondents. It also has a subsection dedicated solely to "space and cosmos." *The Washington Post* contains a large science subsection under the "nation" heading. It also had a section dedicated to the *Columbia* disaster. *The Atlanta Journal-Constitution* has both a science and space section with numerous NASA correspondents. *The Los Angeles Times* has both a science and space section with numerous NASA correspondents.

Articles were obtained using the LexisNexis Academic database. Only first-section stories that contained the terms "*Challenger*" or "*Columbia*" in their headlines or lead paragraphs were collected. Additionally, stories had to contain a statement about NASA within the body. This study focused only on stories appearing during the first 7 days of each crisis (January 28–February 3, 1986; and February 2–8, 2003), because, by its very nature, crisis communications is meant to influence media messages for a short period of time following the crisis. With the passage of time, crisis communications end, and long-term communication strategies are implemented.

The sample units consisted of entire news stories, and coding categories addressed general information (e.g., source, date, byline), the five crisis communications categories, and tone. Generally, low frequencies of effective components and high frequencies of ineffective components indicated ineffective crisis communications. Positive news coverage includes adjectives such as open, honest, and effective. Unfavorable adjectives, such as closed, dishonest, and ineffective, have a negative tone, and neutral adjectives contain no positive or negative connotations. Inter-coder reliability was 87.5%.

Frequencies and cross-tabulations of crisis communication elements and tone of articles between disasters and among newspapers were tabulated utilizing SPSS statistical software. The results were split into three groups: third-party attributes that originated with the newspapers, NASA attributes that originated with the agency, and tone. Variables falling into the third-party category are prompt response, NASA preparedness, truth, credibility, constant flow of information, and accessibility. The NASA variables are absolutes, proactive communication, concern for victims and their families, compassion, shifting blame, and use of spokespersons.

3. Findings

The procedure for selecting appropriate news articles produced a population of 216 stories. A total of 100 stories were written in the week after the explosion of *Challenger* and 116 were written after the explosion of *Columbia*.

The data show that there was a much higher frequency of NASA variables present (29.8%) in the news articles than third-party variables (6.1%). There also were more third-party variables present in articles pertaining to the *Challenger* disaster (3.6%) than *Columbia* (2.5%), and more NASA variables present in articles relating to the explosion of *Columbia* (17.1%) than of the *Challenger* (12.7%) ($p \leq 0.01$).

3.1. Third-party variables

Despite an overall dearth of third-party variables present in the data set, the variables that were present produced interesting and significant results.

3.1.1. Constant flow of information

The constant flow of information variable focused on reports that NASA officials were unable to be reached for comment, gave no answer to a question, or answered a question by stating “no comment.” This was the most prevalent third-party attribute. In 21% of *Challenger* articles, reporters wrote that NASA had an inadequate flow of information. In contrast, this sentiment appeared in only 4.3% of *Columbia* articles ($p \leq 0.01$). In the *Challenger* articles, NASA was usually depicted as disrupting the flow of information between the agency and the media by not making top NASA officials, especially *Challenger* flight director Jay Greene, available to the press for questioning. NASA was also cited as declining to identify debris as it was found and not holding regular press conferences to discuss the disaster (Reinhold, 1986). Examples of NASA disrupting the flow of information in the aftermath of *Columbia* were also present, but less substantial. For instance, NASA held a few closed-door meetings, and was reported to be too busy to respond to media queries when a report surfaced that was critical of the agency.

3.1.2. Accessibility

More than one-tenth of the *Challenger* articles claimed that NASA was inaccessible following the shuttle disaster. In contrast, only one *Columbia* article stated the same, and seven *Columbia* articles mentioned that NASA was accessible following the later disaster ($p \leq 0.01$). Reports of NASA’s inaccessibility following *Challenger* consisted of the agency refusing to let reporters enter headquarters for interviews, telling workers and top officials not to speak to reporters, limiting press conferences to single statements, and not releasing documents or pictures of the explosion to media outlets. *Columbia* officials were said to be inaccessible for not permitting relevant NASA employees to talk to the media about the contents of meetings that took place while the space shuttle was conducting its mission. Overall, however, news reports deemed NASA was “open” after the *Columbia* disaster, and was credited for having twice-daily press conferences.

3.1.3. Credibility

This attribute examined whether the newspaper articles stated that NASA was or was not credible in its communications following each disaster, or whether NASA’s credibility had been hurt or improved in the wake of each disaster. One *Challenger* story stated that NASA was not credible in its communications, and none lauded its credibility. Conversely, 6.9% of *Columbia* articles stated that NASA was credible in its communications, and no articles attacked its credibility ($p \leq 0.05$). Following the *Columbia* disaster and the ensuing crisis communications, NASA’s credibility was compared to the 1986 *Challenger* disaster.

3.1.4. Prompt response

The prompt response attribute gauged how the media covered NASA's initial response to each disaster (i.e., whether NASA's initial response took more or less than 1 hour). Only 2.6% of *Columbia* articles stated that NASA's initial response following the disaster took less than 1 hour, and only 7% indicated that NASA's response following the *Challenger* disaster took longer than 1 hour ($p \leq 0.01$). Preparedness, another variable that affected NASA's ability to respond promptly to the crises, produced similar results. A greater number of *Challenger* articles (6%) stated that NASA was unprepared to communicate and/or respond to the explosion of the shuttle, and a greater number of articles (4.3%) stated that NASA was prepared in the aftermath of the later tragedy ($p \leq 0.01$).

3.1.5. Truth/avoidance of absolutes

The truth attribute appeared in only two *Columbia* articles that stated NASA was truthful in its communications following the 2003 disaster. In these articles, the agency was said to no longer be veiled, closed, or dishonest, as was the perception after the *Challenger* disaster (Sanger, 2003b). The truth attribute was not found in any other articles.

3.2. NASA attributes

NASA attributes appeared much more frequently in coded articles for both the *Challenger* and *Columbia* time periods. Variables appeared in significantly different proportions in the two periods.

3.2.1. Proactive communication

Proactive communication was identified when it was clear that the information being reported to the public was attained through a news conference or television interview. About 26% *Challenger* articles were based on information garnered through news conferences or interviews. In comparison, 56% of *Columbia* articles contained information from proactive means ($p \leq 0.01$).

3.2.2. Choice of appropriate spokesperson(s)

The spokesperson(s) attribute identified up to three NASA officials who provided the media with information in the week following each of the disasters. There were eight possible choices: NASA administrator, the director/manager of the shuttle program, the director/manager of flight operations, a top NASA executive, an unnamed spokesperson, a spokesperson that asked not to be identified, other, and none. All of the analyzed stories contained at least one NASA spokesperson, and no more than the first three spokespersons mentioned in an article were coded. The data were combined into three categories: top-ranking NASA officials, unnamed NASA officials, and general spokespersons. This study found that, in the aftermath of the *Challenger* disaster, those cited for giving out information were top-ranking NASA officials about one-third of the time, unnamed NASA officials about one-third of the time, and a general spokesperson about one-third of the time. In contrast, in the aftermath of the *Columbia* disaster, reporters cited top-ranking NASA officials 75% of the time, unnamed NASA officials less than 10% of the time, and a general spokesperson 15% of the time ($p \leq 0.01$).

3.2.3. Concern for victims

This attribute looked for comments by NASA officials that pertained to the victims of either the *Challenger* or *Columbia* tragedy. Concern for victims in both cases took the form of kind words said

about those who died in the tragedies, and how the agency and the world would grieve their passing. An analysis of *Challenger* and *Columbia* articles showed a trend ($p=0.08$) toward more concern for the victims of the tragedy after the *Columbia* explosion (26%) than after the *Challenger* explosion (16%).

3.2.4. Compassion, avoidance of absolutes, and shifting blame

Findings regarding three attributes were not statistically significant. Compassion attributes were similar between the two disasters, and NASA made no statements blaming an outside entity for either of the disasters. Additionally, no NASA official was quoted using absolutes such as “always” or “never” in media communication, and limited speculation was found in newspaper stories. Speculation reported following the earlier *Challenger* disaster was limited, but was higher after the *Columbia* disaster. When agency officials speculated in the media, they hinted at what might have caused the explosion of either *Challenger* or *Columbia*.

3.3. Tone

The content analysis found seven times as many positive news stories published about NASA following the *Columbia* explosion than after the *Challenger* explosion. The analysis also showed that over twice as many negative news stories published following both disasters pertained to NASA following the *Challenger* explosion. Almost an equal percentage of neutral news stories were published following each crisis ($p \leq 0.01$). Following the *Challenger* crisis, NASA was described by reporters as trying to execute a “news blackout.” The agency’s crisis communications were also described as “troubling,” “high-handed,” “ill-advised,” and a “failure.” Following the *Columbia* disaster, NASA was described as being too hasty and not being completely forthcoming in one instance, but more often was reported as open, accessible, and media savvy. Moreover, the stories in which the agency was described positively were generally stories that directly compared the *Challenger* and *Columbia* disasters.

4. Discussion

Both hypotheses in this study were supported. More of the five criteria for successful crisis communications were found in the news articles about the *Columbia* disaster than in stories about the *Challenger* disaster, which supports the first hypothesis. Moreover, NASA received much more positive news coverage in the four newspapers following the *Columbia* disaster than it received in the aftermath of the *Challenger* explosion, which supports the second hypothesis. It seems feasible to speculate that this positive news coverage was garnered by the agency when it successfully engaged in specific communicative behaviors.

For example, the analysis of third-party versus NASA attributes showed that the organization was better at three criteria – prompt response (e.g., Ogrizek & Guillery, 1999), constant flow of information (e.g., Baron, 2003), and choice of spokespersons (e.g., Barnett, 2003) – following the *Columbia* disaster than after the *Challenger* explosion. News reports showed that NASA avoided speaking in absolutes (e.g., Stanton, 2002) in the aftermath of both tragedies, and displayed concern for victims (e.g., Umansky, 2001) of both the *Challenger* and *Columbia* explosions. Generally, these findings support the extant literature’s recommendations regarding effective crisis communications.

Additionally, NASA received much more positive news coverage following the *Columbia* disaster than the agency received after *Challenger*. Stories reflected that NASA used more proactive communication, made top-ranking executives much more active, had fewer anonymous sources speak to the media, and was more open, accessible, and prepared following *Columbia*. The large differences found in terms of the criteria for effective communications reflect positively on NASA's crisis communications efforts, as reported in the news media.

One finding that veered from the recommendations within literature dealt with speculation. Following the *Challenger* disaster, NASA officials were reported stating that they could not speculate on what caused the shuttle explosion or on the state of the investigation, which would seem to fall in line with accepted crisis communications norms (Stanton, 2002). When NASA refused to speculate on post-*Challenger* events, however, media personnel often bypassed agency officials and talked to professors, engineers, and other professionals who were happy to speculate. Reporters indicated that NASA officials alienated themselves from the media by not discussing particulars of the investigation. In contrast, news reports in the first week following the disaster were more favorable toward NASA officials who cautiously speculated after the *Columbia* explosion. Officials discussed what possibly caused the shuttle explosion, and what the investigation boards were focusing on as suspected causes. Thus, NASA was able to focus the media on what the agency had to say on a daily basis. Results reflect there was less need for media to utilize sources outside NASA because most of the information reporters needed was provided in the twice-daily press conferences. It might be hasty, however, to recommend that a little speculation may, in fact, go a long way in crisis communications, based on a 1-week study of four prominent newspapers. Although crisis communications are designed to affect media messages for a short time, the impact may produce a ripple effect. Authors Cabbage and Harwood (2004) found, for example, that speculation created more problems for NASA than it ultimately resolved. It would be premature to propose procedural changes even though this study's findings challenge contentions of extant literature (e.g., Stanton, 2002). It may turn out that speculating in the short term may have ruinous, long-term consequences if speculating is incorrect.

There are four lessons learned from the coverage of the two NASA tragedies. These topics should be considered by organizations in preparing to deal with crises.

- (1) Crisis communication affects media portrayal of an organization. The results suggest that the print media's coverage of an organization during a crisis is directly related to particular communicative behaviors and practices of the organization (Ogrizek & Gullery, 1999; Seymour & Moore, 2000). The media gave more positive coverage of NASA when it viewed the agency as engaging in specific communicative behaviors that followed the *Columbia* disaster but did not follow the *Challenger* disaster. Further research should examine the impact these positive portrayals had on NASA's other stakeholders.
- (2) Learn from the past. This study highlights the importance of learning from past crises, and more importantly, making sure that what is learned sticks. NASA seemed to learn a lot from its crisis communications failures throughout the past four decades. NASA fumbled its communications following the fire that killed the Apollo 1 crew in 1967 (Kauffman, 1999, 2001), but rebounded to successfully communicate during the Apollo 13 crisis (Marshall, 1986). Then, NASA seemed to forget what it had learned after Apollo 13, and reporting reflected NASA's failure to employ recognized communications techniques following the *Challenger* explosion. Finally, the agency again practiced sound crisis communications techniques following NASA's latest tragedy (Baron, 2003; Dickey, 2003; Gustin

& Sheehy, 2003), as reflected in this study's analysis of media coverage. NASA's inability to retain what it learned from the Apollo 1 and 13 crises may make the agency's *Challenger* mistakes even more egregious in the eyes of NASA's stakeholders. Mistakes can be damaging to an organization in crisis—but mistakes made more than once are worse.

- (3) Speak, and speak often. The most common complaint from the media following the *Challenger* disaster was that NASA was not providing adequate information as the inquiry progressed. In contrast, the media latched onto NASA's use of two press conferences per day during the *Columbia* investigation and stated that this effort signified NASA's willingness to conduct an open and honest inquiry, a contention supported by Congress (Joint Hearing, 2003) and the *Columbia Accident Investigation Board* (2003). Hence, NASA's ability to maintain a constant flow of information during its crises may have driven the way the media covered the agency more than any other crisis communications criteria (e.g., Baron, 2003).
- (4) The media are not out to get you. Although many organizations in crisis hold the view that the media are the enemy, organizations must work with the media to successfully communicate to their stakeholders (Augustine, 2000). The lack of third-party variables in the articles analyzed indicates that the media were not quick to judge an organization in crisis. But organizations should also know that, given the effectiveness of crisis communications efforts, the media would not shy away from printing news stories evaluating the organization's performance.

This project focused solely on newspaper coverage of four key publications during the first week following each crisis. Analysis of other media outlets might support these findings or provide additional insight. Studies regarding long-term impact – that is, coverage after the initial crisis communications was completed – also may provide an additional perspective.

5. Further research

The results produced many interesting avenues for further crisis communications research. First, the speculation anomaly is a curious one, and additional research, including longitudinal studies of crisis coverage and subsequent stakeholder attitudes, may add to the existing body of knowledge. Second, the constant flow of information criterion was most vital to NASA's success or failure in its crisis communications. Focusing on many crisis communications cases might more adequately determine its relative importance among the crisis communications variables, perhaps bringing organizations closer to having a more concrete framework to plan for crises. Third, because all crises are different, it would be difficult to contend that these results can be applied universally. The *Challenger* and *Columbia* explosions were crises of epic proportions. They captured the interest of the entire nation, were seen on live television or captured on video, and were immediately covered by media across the country. Not all crises are like this. More research needs to be conducted on other types of crises to see if similar patterns are discovered.

References

- Augustine, N. (2000). *Harvard Business Review on crisis management*. Boston: Harvard Business School Publishing.
- Barnett, C. (2003). Crisis communications now: Three views. *Public Relations Tactics*, 10(1), 15–16.
- Baron, G. (2003). The blame game: Lessons learned from NASA. *Public Relations Tactics*, 10(5), 26.

- Benoit, W. (1997). Image repair discourse and crisis communication. *Public Relations Review*, 23, 177–186.
- Broad, W. (1986, January 29). The shuttle explodes: 6 in crew and high school teacher killed 74 s after liftoff. *The New York Times*, A1.
- Cabbage, M., & Harwood, W. (2004). *Comm check. . .the final flight of shuttle Columbia*. NY: Free Press.
- Columbia Accident Investigation Board Report, Vol. 1 (2003). Online http://anon.nasa-global.speedera.net/anon.nasa-global/CAIB/CAIBlowres_full.pdf. Retrieved 11 January 2005.
- Coombs, W. (1998). An analytic framework for crisis situations: Better responses from a better understanding of the situation. *Journal of Public Relations Research*, 10, 177–191.
- Coombs, W. (1999). Information and compassion in crisis responses: A test of their effects. *Journal of Public Relations Research*, 11, 125–142.
- Coombs, W., & Holladay, S. (1996). Communication and attributions in a crisis: An experimental study in crisis communication. *Journal of Public Relations Research*, 8, 279–295.
- Dickey, B. (2003). NASA opens up after disaster. *Government Executive*, 35(3), 17.
- Duke, S., & Masland, L. (2002). Crisis communication by the book. *Public Relations Quarterly*, 47(3), 30–35.
- Gaschen, D. (2003). Crisis—what crisis? Taking your crisis communications plan for a test drive. *Public Relations Tactics*, 10(5), 12.
- Geibel, J. (1996). Public relations 911. *Public Relations Tactics*, 3(9), 25.
- Gustin, C., & Sheehy, J. (2003). Avoiding the seven sins of crisis communication. *Electric Perspectives*, 28(4), 5–6.
- Hearit, K. (1994). Apologies and public relations crises at Chrysler, Toshiba, and Volvo. *Public Relations Review*, 20, 113–125.
- Horsley, J., & Barker, R. (2002). Toward a synthesis model for crisis communication in the public sector. *Journal of Business and Technical Communication*, 16, 406–440.
- Ihlen, O. (2002). Defending the Mercedes A-Class: Combining and changing crisis-response strategies. *Journal of Public Relations Research*, 14, 185–206.
- Joint hearing before the Subcommittee on Space and Aeronautics, Committee on Science House of Representatives and the Committee on Commerce, Science, and Transportation, U.S. Senate (2003). In *Proceedings of the 108th Congress* (Serial No. 108-2), First Session, 12 February 2003. Online http://frwebgate.access.gpo.gov/cgi-bin/useftp.cgi?IPaddress=162.140.64.128&filename=85090.wais&directory=/disk5/wais/data/108_house_hearings. Retrieved 11 January 2005.
- Kauffman, J. (1999). Adding fuel to the fire: NASA's crisis communications regarding Apollo 1. *Public Relations Review*, 25, 421–432.
- Kauffman, J. (2001). A successful failure: NASA's crisis communications regarding Apollo 13. *Public Relations Review*, 27, 437–448.
- Marshall, S. (1986). NASA after Challenger: The public affairs perspective. *The Public Relations Journal*, 42(8), 17–23.
- Ogrizek, M., & Gullery, J. (1999). *Communicating in crisis*. New York: Aldine De Gruyter.
- Reinhold, R. (1986, January 29). The shuttle explosion: At mission control, silence and grief fill a day of horror long dreaded. *The New York Times*, A8.
- Sanger, D. (2003, February 2). Loss of the shuttle: The overview; shuttle breaks up, 7 dead. *The New York Times*, A1.
- Sanger, D. (2003, February 3). Loss of the shuttle: The Challenger; Lessons from uneven Challenger investigation help create attitude change. *The New York Times*, p. A23.
- Seymour, M., & Moore, S. (2000). *Effective crisis management: Worldwide principles and practice*. London: Cassell.
- Stanton, P. (2002). Ten communications mistakes you can avoid when managing a crisis. *Public Relations Quarterly*, 47(2), 19–22.
- Ulmer, R., & Sellnow, T. (2000). Consistent questions of ambiguity in organizational crisis communication: Jack in the Box as a case study. *Journal of Business Ethics*, 25, 143–155.
- Umansky, D. (2001). How to survive and prosper when it hits the fan. *Public Relations Quarterly*, 38(4), 32–34.
- Ware, B., & Linkugel, W. (1973). They spoke in defense of themselves: On generic criticism of apologia. *Quarterly Journal of Speech*, 59, 273–283.
- Zerman, D. (1995). Crisis communication: Managing the media. *Information Management & Computer Security*, 3(5), 25.