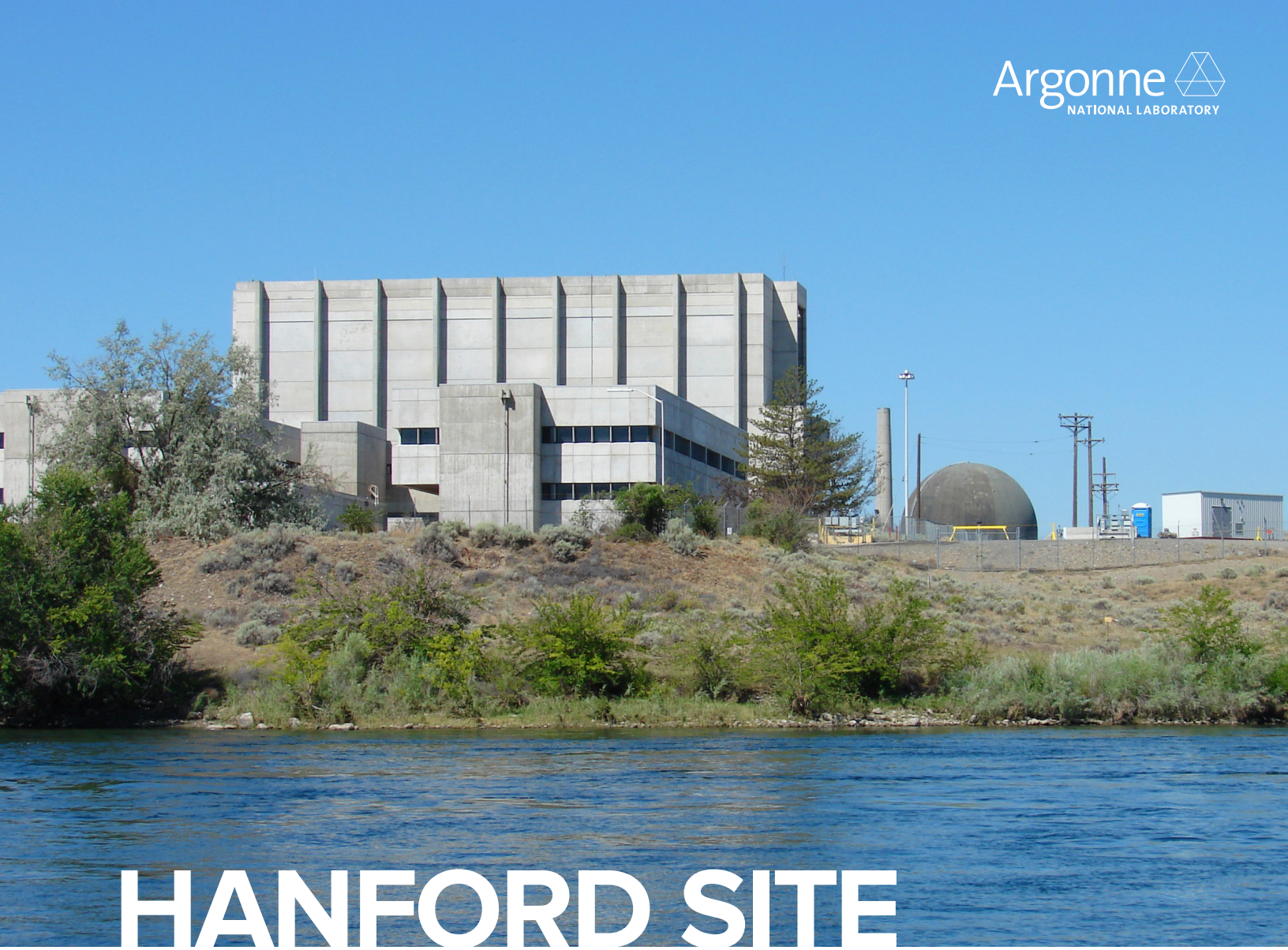
Argonne NATIONAL LABORATORY



HANFORD SITE
EMERGENCY PUBLIC INFORMATION CASE STUDY

PUREX TUNNEL COLLAPSE

May 9–10, 2017

PAST | FUSION CELL
PUBLIC AFFAIRS SCIENCE AND TECHNOLOGY

PURPOSE

From October 2017 through March 2018, researchers from Argonne National Laboratory's Public Affairs Science and Technology (PAST) Fusion Cell conducted a case study on a tunnel collapse that occurred May 9, 2017, at the Hanford Site, a U.S. Department of Energy (DOE) facility near Richland, Washington. The purpose of this study was to collect and analyze data to identify emergency public information best practices and lessons learned from the event.

The study used telephone interviews with those who had direct knowledge about and experience with the event, and analyzed existing literature on the subject, including newspaper articles, television reports, and internet resources such as Twitter and Facebook. Two researchers from the PAST Fusion Cell employed a qualitative research method using purposeful critical-case sampling to gather information and interview emergency management staff with firsthand accounts of communication processes used during the event. The researchers asked interviewees open-ended questions regarding their backgrounds and experience, their role in the emergency event, their perceptions of how emergency public information and crisis communication during the emergency were handled, and their general opinions about Hanford's overall response to the event. The research team conducted a total of two formal group interviews with Hanford Public Affairs, as well as individual follow-on interviews with DOE/National Nuclear Security Administration (NNSA) Headquarters staff. Content analysis was performed by the research team to examine documentation of the emergency response in the news media.

The goal of the study was twofold: (1) to conduct a gap analysis regarding emergency public information and crisis communication to stakeholders during the Hanford tunnel collapse, and (2) to gain insight on how to improve and maximize future communication response during DOE/NNSA emergency events. The results of the study are intended to add to the body of knowledge and to deepen practitioners' understanding of the importance of multidisciplinary emergency public information and crisis communication processes. The results and recommendations from this study can be generalized for future practice and implementation of emergency public information and crisis communication across the DOE/NNSA complex.

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INTRODUCTION

The Hanford Site, a 580-square-mile DOE facility near Richland, Washington, was one of the cornerstones of Cold War weapons production. From World War II through the end of the Cold War era, Hanford's production facilities manufactured more than 20 million pieces of uranium metal for nine reactors located along the Columbia River. This production resulted in the discharge of more than 450 billion gallons of liquids to soil disposal sites and 53 million gallons of radioactive waste to 177 large underground tanks, according to the DOE's Office of Environmental Management.

Plutonium production ended in the late 1980s. Cleanup of the Hanford Site began in 1989, when DOE, the U.S. Environmental Protection Agency, and Washington State reached a landmark agreement. Due to the volume of materials generated at Hanford, the cleanup of the Site has presented DOE with one of its greatest environmental challenges.

By 1965, two waste storage tunnels had been built next to PUREX to bury equipment used in plant operations. The older tunnel, PUREX Tunnel 1, was constructed of creosoted timbers and concrete, and topped with about 8 feet of soil. A remotely operated engine backed railroad cars loaded with contaminated equipment into the tunnel. They were stored there, and the door was eventually sealed closed. Numerous storage areas at Hanford are in the process of being removed as part of the Site's cleanup.

Due to the potential hazards posed by the stored contaminated materials, people in the region have often viewed the Hanford Site with concern. DOE and contractor Public Affairs staff work diligently to keep the public informed about activities at Hanford. They maintain a robust Emergency Public Information (EPI) program to handle incidents or accidents should they occur. This EPI function was tested on May 9, 2017, when a portion of the roof of PUREX Tunnel 1 collapsed. No contamination was detected at any time, but Hanford Public Affairs staff had to work quickly to coordinate, develop, and disseminate timely and accurate emergency public information.

The Plutonium Uranium Extraction Plant (PUREX) is located about 19 miles northwest of Richland in Hanford's 200 East Area, which is near the center of the nuclear site. It is about 7 miles from the Columbia River. The building has been vacant for more than 20 years.

Plutonium Uranium Extraction Plant (PUREX)

Location of Hanford Site in south central Washington

Map of Hanford Site

INITIAL COMMUNICATIONS

At 8:06 a.m.* on May 9, 2017, workers at the Hanford Site discovered a subsidence of dirt over PUREX Tunnel 1. An alert-level emergency was classified at 8:26 a.m. Warning sirens sounded and employee notifications were issued. The potential for injuries and airborne contamination led Hanford to declare an Operational Emergency at 8:37 a.m. More than 3,000 workers sheltered-in-place. Ventilation inside buildings in the affected area was turned off to prevent potential exposure to any contaminants. First responders and work crews mitigating the emergency eventually confirmed that a 20-foot by 20-foot wide hole was visible at the tunnel roof from the apparent collapse of more than 8 feet of dirt. Airborne radiation detectors were monitored throughout the event, but no contamination was detected at any time.

The DOE Hanford Public Information Director (PID) said that he received an initial call from another public affairs official shortly before the site's warning systems were activated at 8:26 a.m. The Emergency Operations Center (EOC) conducted its first callout at 8:37 a.m., and was declared operational at 9:15 a.m. The PID reported to the EOC, which took him about 20 minutes. While en route, the PID said he received approximately 20 telephone calls from local, regional, and national media. The event was upgraded to a Site Area Emergency at 10:21 a.m.

According to Hanford Public Affairs staff, the Tri-Cities area in Washington has very active news media, and one television station—KING 5 based in Seattle—has a reporter who has done numerous stories on the Site, winning awards for her reporting. As a result, the PID said that many Hanford employees maintain an ongoing relationship with her and routinely reach out when something happens, providing her a well-established network of sources. In the case of the PUREX tunnel collapse, as soon as the alarms sounded at least one employee began sending her the message notifications and employee communications that were being disseminated. The KING 5 reporter first posted about the emergency to her Twitter account at 8:29 a.m.—just 3 minutes after the initial notifications. Other news media outlets saw her first report on Twitter and began covering the event. This led to a barrage of media attention right at the outset.

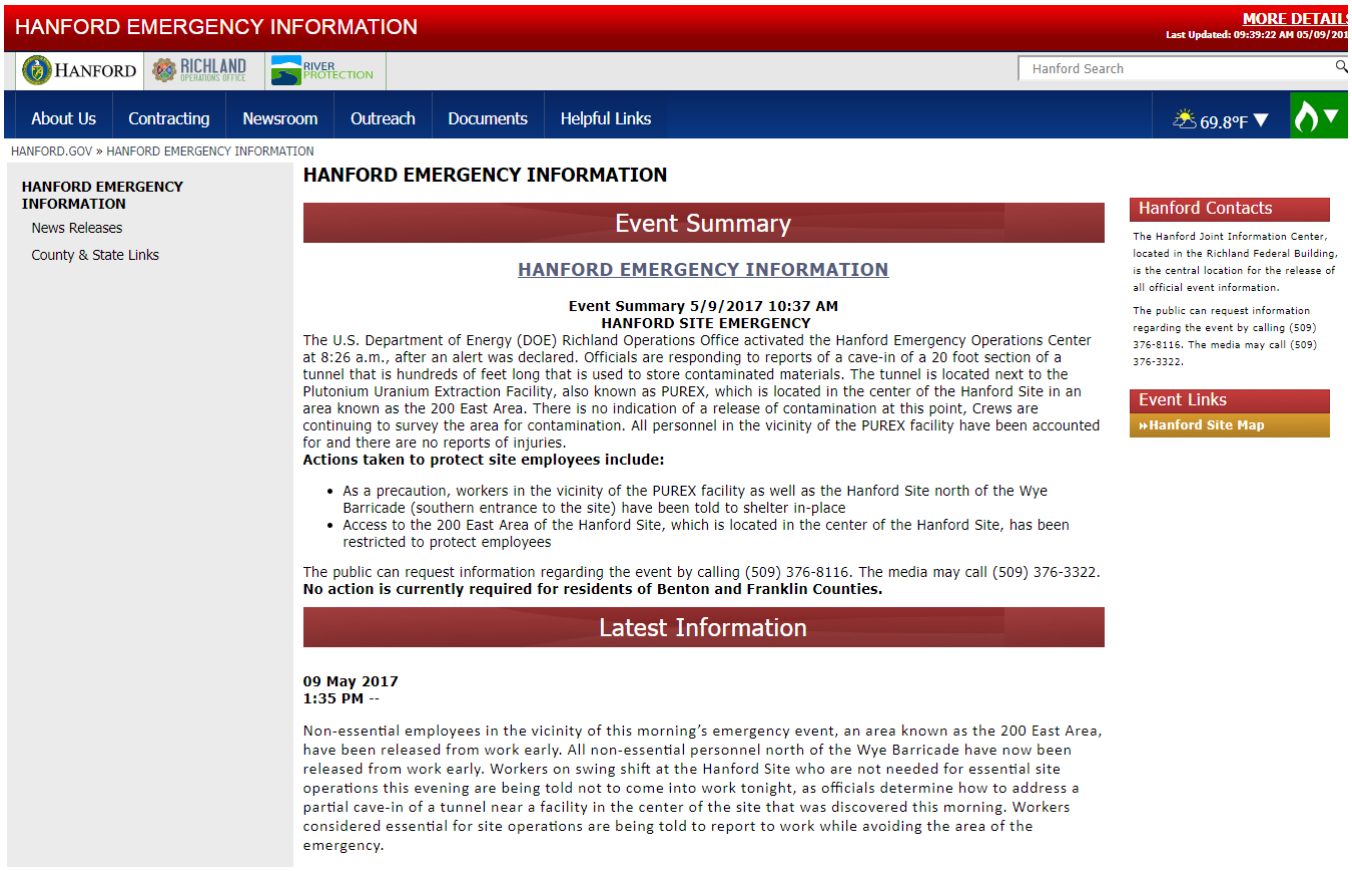
Collapse of PUREX Tunnel 1.

According to the PID, the Site does not have a social media policy regarding employees' use of personal phones, citing a Hanford legal counsel decision that certain laws prohibited dictating what employees were allowed to post to social media. "The Department of Energy allows the use of personal phones at the Hanford Site. It used to be we were able to put out a message to employees and you wouldn't receive any public or media inquiries for an hour or two. Now by the time you get to the EOC, the information is everywhere," the PID said.

Initial tweet about Hanford event from KING 5 reporter.

The Hanford Public Affairs Public/Media Information Team Lead first received notification of an event through an automatic cellphone notification. The Team Lead had previously configured his cellphone to receive automatic alerts whenever something is posted about Hanford on social media. (The pre-setting of cellphones to automatically receive specified social media notifications is considered a best practice in the public affairs community.) Other members of the EPI team were notified when employees called them.

* All times are in Pacific Daylight Time, unless otherwise noted.



Emergency information event summary webpage on Hanford website.

The first action the Site's Public Affairs staff decided to prioritize was updating the event summary on the Hanford emergency information webpage with as much information as possible. Public Affairs activated the emergency information webpage at 9:05 a.m. and made its first social media post to Facebook at 9:09 a.m., directing the public to go to the webpage for official event information. However, the webpage initially did not have any information. The PID indicated that it took some time to get an understanding of what had occurred. According to the event summary, the first actual post appeared at 9:39 a.m. However, even after this step was complete and subsequent posts were made, staff spent the rest of the day trying to get ahead of the various news media and social media reports.

The PID said that, between news stories and Hanford employees posting to social media, the event received significant public attention. Some employees posted their own photos and video, and in some cases they even sent their photos and videos directly to the news media. "There's such a vast network of employees who call the media," the PID said. "The technology has gotten so fast, and our employees have that technology, so whatever we put out to employees is instantly accessible by the public."

(Due to the large amount of employee postings, the PID said Hanford Public Affairs is now reexamining how and what is placed on the emergency information webpage during the early phase of a response. "Really, this is an evolution we are looking at; we're looking more closely at what we can include in our media advisory and initial public announcement that provides enough context to get the response we need," the PID said. "Having people take protective action is the most important part of any response. But can we put more information in our initial messages to employees that covers everyone, including the media and public? This is something we're taking a broader look at.")

HEADQUARTERS PUBLIC AFFAIRS

Within DOE, the Hanford Site, due to its ongoing environmental cleanup projects, falls under the purview of DOE's Office of Environmental Management (EM). The Hanford EPI procedures require the PID to contact several DOE Headquarters offices, beginning with the DOE Watch Office and the EM Office of Public Affairs. Other notifications occur as needed, with the expectation that information will be shared and coordinated among the various offices. During this event, the PID worked extensively with the EM Public Affairs Office and the DOE Headquarters Office of Public Affairs, beginning with initial contact at 9:25 a.m. on May 9 and continuing with regular communications over the subsequent two days of the emergency response.

The NNSA Office of Emergency Management Plans and Policy (NA-41) oversees the implementation of DOE's Emergency Management System for DOE and NNSA sites, facilities, and transportation activities. In discussing the Hanford event after it occurred, the NNSA Director of Strategic Communications—who first learned about the tunnel collapse from the KING 5 tweet—identified several issues that impacted the Headquarters response. This included the fact that emergency plans are inconsistent across the enterprise, so depending upon which program office a site falls under, the guidance may be different. The timing of the accident also affected the efficacy of actions at Headquarters.

"A lot of the Headquarters offices were in transition following the election. A lot of key staff were not in place. A lot of people were still in acting roles. There were questions about what authorities people had to make decisions. Some hadn't received their emergency management briefings. The secretary was on travel at that time. A series of things added to the confusion," the Strategic Communications Director said.

WEBPAGE COMMUNICATIONS

Most public information was posted on Hanford's official website (www.hanford.gov), which had an emergency information webpage dedicated to status updates on the tunnel collapse. According to the Joint Information Center (JIC) Manager, the webpage was activated at 9:05 a.m. However, although the webpage quickly went live and the JIC staff worked to complete the first event summary as soon as possible, *Good Morning America* was already broadcasting about the tunnel collapse. At this early stage some event information could not be expeditously provided by the JIC, because the EOC needed visual confirmation of the status of the tunnel. The JIC Manager said, "It took a little longer than we anticipated until the EOC finally confirmed."

According to the PID, one of the first and most important considerations for Hanford Public Affairs was how soon they could announce that there was no contamination. The goal of the Public Affairs team was to focus on whether there were any injuries, and to address the impacts of the tunnel collapse on employees at the site. "We wanted to get as much information out as we could," the PID said. He added, "The other thing is, if we want to influence the first two to four hours of coverage, we need to put as much information as we can in our initial messaging to employees. That would give what we're doing a lot more context. Employees will be doing more communicating than anyone."

The EOC Operations Manager said that getting the emergency information webpage operational involves the website administrator activating pre-scripted emergency page templates. There was basic pre-scripted information already in place, but during the PUREX response there was a major push to also provide photos and video, and to address whether there was contamination. The EOC Operations Manager said that, fortuitously, prior to the emergency an exercise had been scheduled to test EPI plans and checklists, so some of the information the staff planned to disseminate had already been developed. The team had also updated Hanford's EPI plan 6 months prior to the event to address social media strategies, which resulted in many of the necessary tools already being in place.

Although it took a couple of hours for the EOC to confirm some information regarding the tunnel collapse, the JIC staff quickly established the emergency information webpage as the official information source and continued to drive traffic to the website from Hanford's Facebook and Twitter pages. Initially, the webpage was updated at least every 30 minutes. Thereafter, according to the Online Media Team Lead, the webpage was updated at least once every 2 hours to provide context so that reporters and members of the public could pick the information up easily.

At DOE Headquarters, the Strategic Communications Director said the webpage was helpful and informative, although it created some unique challenges. She said it appeared that Hanford cybersecurity locked down access (either purposefully or inadvertently) so that international partners could not reach the website. As a result, some organizations, like the International Atomic Energy Agency (IAEA), were contacting Headquarters for updates. According to the Strategic Communications Director, "We reached back to Hanford and said, 'you've got to fix this.'" She added, "I'm not sure if it got resolved, but eventually I started pulling data from the website and putting it in the IAEA reporting structure."

The Hanford PID said that in the past his team had relied exclusively on the website as an emergency public information resource, until it was brought to his attention that certain international organizations could not access the website due to cybersecurity controls. As a result, Hanford began using social media and the website in tandem. As the Headquarters Strategic Communications Director indicated, the website created some issues for Headquarters because international partners could not access it.

SOCIAL MEDIA COMMUNICATIONS

As with responses to other emergency events in recent years, the Hanford Site immediately used its Facebook and Twitter pages to communicate with the public and media. Early in the response, Hanford posted information about the tunnel collapse, encouraged followers to regularly check the website for additional information, and provided updates regarding mitigation of the emergency.

Initial Hanford post about the emergency to its Facebook page.

The PID said that an emergency computer and telephone notification system always disburses initial notifications to employees, even though many employees follow the Hanford Facebook page. Hanford also used social media in tandem with the website to assist in sharing information with international organizations that otherwise may not have had access to the Hanford emergency webpage due to cybersecurity controls. At the same time, nearly every major news media outlet provided its own active social media coverage of the Hanford accident during the first two days of the response.

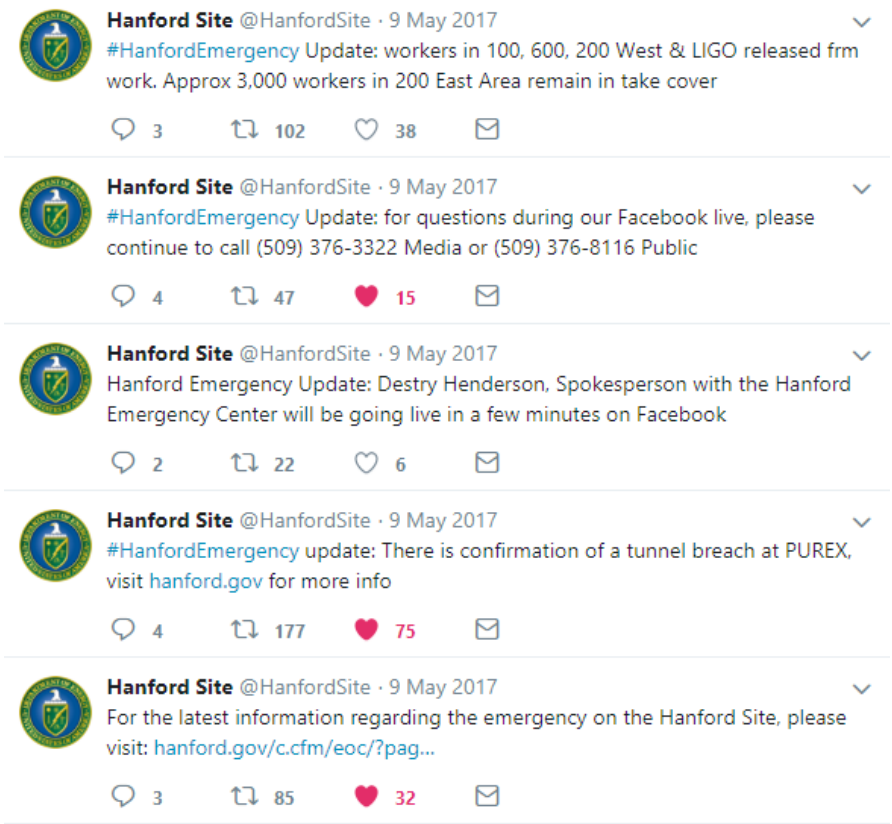
As evidence of the scope of the information demands on Hanford's Public Affairs staff, the PID said that the Hanford Security and Information Services Director told him that additional web servers had to be added to support the overload from website traffic. The EOC Operations Manager provided statistics that showed more than 2 million people accessed the Hanford website on May 9–10, and Hanford's Facebook posts reached more than 700,000 people. The PUREX accident was the top trending topic on Twitter on May 9 (and stayed there until the firing of the FBI Director later that day).

By the second day, employees took it upon themselves to start responding directly to comments on social media. In the early stages of the event, it had been a challenge for Public Affairs staff to keep up with and try to manage employee postings. However, as the response progressed, Hanford Public Affairs indicated that it was helpful for employees to post comments that answered questions and corrected erroneous information posted by others outside Hanford.

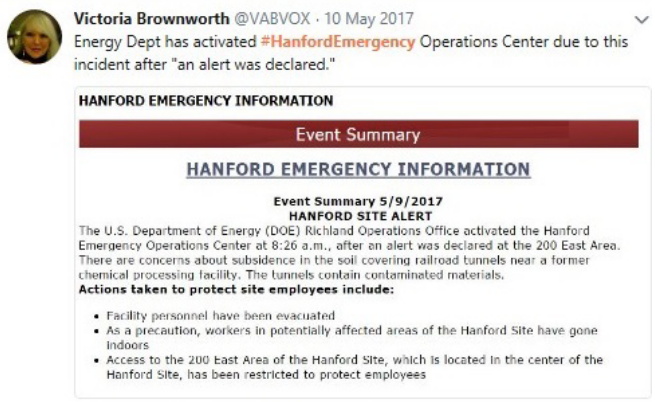
In addition, the Public/Media Information Team Lead indicated that Hanford uses Facebook and Twitter to direct traffic to its official website. Every time Hanford Public Affairs posted to Facebook, staff also tried to post to Twitter. Most of the messages were the same, driving traffic back to the Hanford emergency information webpage where the most current information was displayed. Because Twitter has a smaller character count, some messages had to be edited to adhere to Twitter's 140-character message limit, but the essence of the messages was unchanged. (Twitter has since increased its character count to 280.)

Due to the high volume of social media traffic, most of the misinformation detected during the event was identified to originate from social media. However, according to the EOC Operations Manager, "I don't think anyone was purposefully putting out information to intentionally harm us or to misrepresent things." She went on to note that, for the most part, the information independently posted by employees was accurate, and that the official social media team would not have been able to keep up with all of the public comments anyway.

At the Headquarters level, the Strategic Communications Director acknowledged that staff there did not leverage social media in an effective way. She stated, "We didn't do enough on our end. It goes back to the issue of no chiefs. We were indecisive about how to react, which was kind of hamstringing us. We spent far too much time wordsmithing one sentence about how the secretary should respond, rather than just responding. We got in our own way and were not as proactive as we should have been. We should have been much more proactive, for example by retweeting Hanford's messages, so they would have also been coming from DOE Headquarters."



Tweets from Hanford Site during first day of response.



Reposting of Hanford emergency information webpage.

Tweet from advocacy group during Hanford event.

COMMUNICATIONS STAFFING

The Public/Media Information Team Lead said the EOC and JIC at Hanford activated quickly and were fully operational within the first 45 minutes of the event. Key to the initial response was the online media team, which consists of both phone team members and social media monitors. There were three social media monitors, but the Public/Media Information Team Lead also indicated that many of the phone team members can also monitor social media at the same time, and in fact did so during the event.

JIC/EPI staff were dedicated to the mission and many of them worked overtime. However, the Public/Media Information Team Lead conceded that although he felt the JIC/EPI group had sufficient staff to address media queries and social media concerns during the two-day event, additional people would have been helpful. "There were definitely times we couldn't keep up," he said. "At one point we made the collective decision that we can't respond to everyone's comments. We just started posting 'for the most up-to-date information, go here.'"

More specifically, the Public/Media Information Team Lead said the group could have used one more person on the first day of the event, particularly to assist with high-level queries. He characterized the early hours of coverage as "overwhelming," saying it was certainly the biggest communication event he had ever been a part of. Furthermore, the Deputy News Manager said he noticed a bottleneck in responding to comments people were making on social media versus those call takers were hearing on the phone. This was because not everyone in the JIC had the knowledge or authority to correct some of the misinformation that was identified online.

The Deputy News Manager indicated that phone team members received a lot of questions they were unable to answer, and that it subsequently took time to get a response from those who were authorized to talk. "It would be helpful to determine how you are going to answer and interact with people on social media. Are you engaging in a dialogue or just pointing to your webpage?" the Deputy News Manager said. "Are you addressing your critics? We adjusted as we went, but there didn't seem to be a hard and fast process. The approval aspect drained our resources, and I think that had an impact on our overall effectiveness."

Still, the Public/Media Information Team Lead said he was able to take questions the phone team and social media monitors received and to coordinate with the PID and the JIC Manager to answer queries. Staff then put the responses on a whiteboard for the phone team and social media monitors. It remained an ongoing process to gather, verify, and disseminate information. A second PID noted that phone team members working the overnight shift started receiving more international calls as it became morning overseas. This highlights the need to be aware of how staffing correlates to times of day in other parts of the world—particularly for events that generate significant international interest.

In addition to staffing each position with a minimum of three volunteers from other program areas, Hanford has access to additional human and organizational resources that the Site can reach out to if the event turns out to be more serious, or requires a longer activation.

HEADQUARTERS COORDINATION

Hanford identified several areas where coordination with Headquarters could improve. For example, the DOE Hanford PID said that coordination with the DOE Headquarters Public Affairs Director is listed fifth on his EPI checklist. However, he explained that Hanford has an agreement with Headquarters Public Affairs that, in an emergency, the PID can approve the release of information, as needed, and that the highest priority is to release accurate health and safety information to the public as quickly as possible.

According to the PID, "We learned that getting confirmed information to the public and media during the initial hours of an emergency is very challenging with employees posting to social media and media using unverified information as sources for stories that generated a lot of inquiries from Headquarters staff, political contacts, and other media. Initially, there was a lot of confusion generated by inaccurate information in media coverage. Many of the Headquarters contacts started contacting us individually. They were watching our social media. It really tasked us to get them the information."

The PID added that because media interest was so significant during the event, providing information and coordinating with Headquarters practically became a full-time job. He acknowledged that there was as much demand for information from DOE and NNSA employees in Headquarters as there was from the media and public.

On the first day of the tunnel collapse, DOE EM also had many questions. In addition, the Hanford Public Affairs team was tasked with preparing notes for the Secretary of Energy. However, Hanford's most important priority was always to promptly let employees and the public know that no contamination release had occurred during the collapse.

The PID said he uses his judgment about when to reach out to DOE Headquarters Public Affairs to coordinate information, and that he worked extensively with Headquarters and EM public affairs staff on messaging after initial information was posted by Hanford to the emergency information webpage. With the approval of the PID, public affairs staff in the EOC post information on the Hanford emergency webpage, then the JIC team uses that information to post to social media, provide information to reporters, and answer questions from the public.

Efficiencies have been realized by posting everything to a single source. When information is on the webpage that means it is approved for release to everyone, including Headquarters.

The Strategic Communications Director added that Headquarters can help in events like this by mitigating the strong international interest. "It's often these low-level things that blow up in our faces. Nothing about the Hanford incident should have caused all this. There was no release, no contamination spread. Dirt fell in a hole, and you literally had to stand right over it to get any reading," she said. "But we also realized there weren't enough people in Headquarters who could explain the science—specifically the lack of risk—or who were senior enough to do it. That created too much reluctance at Headquarters to be involved because of a lack of understanding and lack of process awareness."

FACEBOOK LIVE

Notification from Hanford about upcoming Facebook Live broadcast .

The most notable aspect of Hanford's Public Affairs response to the PUREX tunnel collapse was the use of Facebook Live to broadcast real-time information from the EOC. The EOC Operations Manager indicated that the decision to employ Facebook Live was serendipitous, stemming primarily from there being a problem with the normal audiovisual equipment used for news conferences. "We said, 'We can't do a news conference, but we can use Facebook Live.' It was a learning process from there," he said.

Although several members of the Public Affairs team had some familiarity with Facebook Live, the use of the platform by Hanford as an emergency information dissemination tool was essentially new for everyone. The Deputy News Manager said it is a normal part of his job to conduct media interviews, and during the PUREX tunnel collapse he found the volume of media requests was spreading staff very thin. "Frankly, we didn't have a lot of resources [...] so it was 'tag, you're it,'" the Deputy News Manager said.

The Deputy News Manager was called on to conduct the first Facebook Live broadcast, which took place about two and a half hours after the tunnel collapse occurred. "I didn't have any experience with Facebook Live," he said, "but it was not unlike any other media interview I've done. We felt we needed to address the

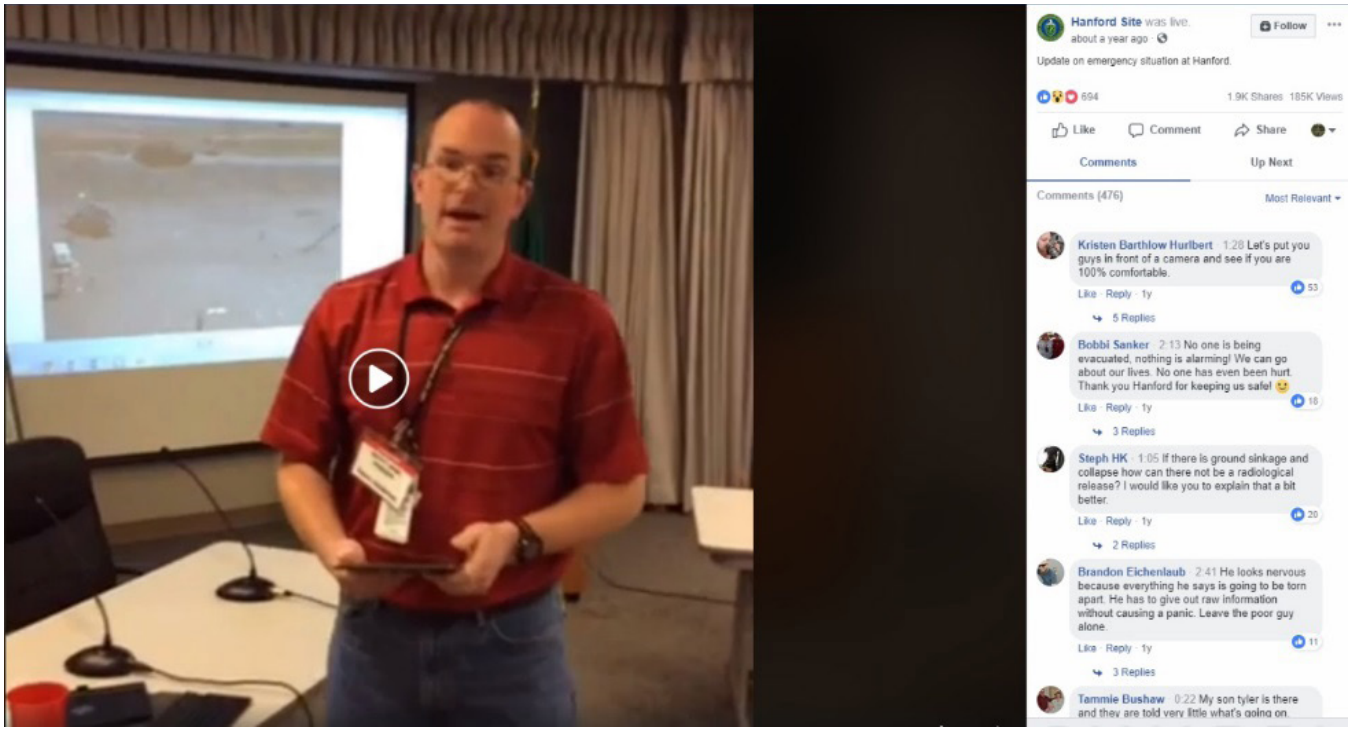


Image from Facebook Live broadcast with spokesperson for Hanford Site.

situation in a format the media and public could access, and to do it as quickly as possible."

Once the decision was made to use Facebook Live, the JIC Manager and News Manager worked for about 20–30 minutes to develop the content and talking points, and used a map of the area that showed the location of the PUREX tunnel. Most importantly, they felt they needed to tell the public that there was no evidence of contamination or release. They made a point to direct people back to the Hanford website, which contained the latest information.

The Public/Media Information Team Lead said that everything related to the production got better as the Facebook Live broadcasts went on: the lighting improved, the speaker became more comfortable, and the messaging was sharper. Two broadcasts were conducted on the first day and two more were conducted on the second day. The PID described the effort as "ingenuity on the spot" and demonstrated an ability "to think outside the box." He said the reason he approved using Facebook Live was simple. "We have people in the JIC that we trust, that we've vetted, and who have the professional experience and judgment to accomplish information sharing. We trust the people on our team."

The Headquarters Strategic Communications Director acknowledged the quick thinking of the Hanford Public Affairs team, but she noted a few concerns with the use of Facebook Live. Primarily, she questioned the use of a junior member of the Public Affairs team as a spokesperson in an informal setting, rather than senior staff in a more official setting. She also said she felt there was a lack of a "Federal" DOE presence in the response. The Strategic Communications Director added that NNSA Headquarters did not know about the first Facebook Live broadcast until after it happened, and only had 12 minutes warning for the second broadcast.

One of the key elements that makes Facebook Live so popular among audiences is that it allows broadcasters to monitor and respond to comments during the broadcast. Because available resources were limited, comments were collected at the end of each broadcast and used to inform future talking points and strategic messaging. The Public/Media Information Team Lead said most comments were about the quality of sound and video, and that some people expressed thanks for the updates.

The Deputy News Manager said that after each broadcast the Public Affairs team would offer feedback to help improve the approach for the next one. As everyone became more comfortable with the process, the broadcasts included more dynamic resources. He said, "They would tell me to talk slower, pay attention to my body language. Delivery characteristics. Style improvements. We would refine our information. Our best broadcast was the last one, and we were able to project three different images on the wall."

According to the Deputy News Manager, "As the situation progressed, I don't think we fully realized the positive impact the broadcasts were having." He added, "A huge number of people saw them. I think it cut down on the requests for interviews." The JIC Operations Manager said that news outlets responded to Facebook Live better than to other visuals. For that reason, it met its purpose and was "incredibly effective." She added, "Looking back, we could have done Facebook Live reports from the scene."

The JIC Operations Manager admitted everyone was a little nervous in the beginning and acknowledged that the presentation was unpolished. However, that was also thought to have had an unintended benefit, in that the broadcasts looked and felt authentic rather than being overly produced, perhaps enhancing their credibility. "We were as honest as we could be. We weren't trying to hide anything. People appreciated that openness and honesty."

The JIC Manager said that he felt the news media appreciated the Facebook Live broadcasts, and some reporters specifically mentioned that they were valuable. In fact, CNN embedded part of a Facebook Live broadcast in a news report. A member of the JIC Online Media Team agreed, "There's something about going live that is extremely powerful. And newsrooms are spread so thin as it is, if you put things out there, the media will pick it up."

According to the EOC Operations Manager, efforts are underway to make Facebook Live a part of Hanford's normal EPI process. The Site is ordering equipment and working on improvements, such as building the process into its JIC procedures. She said staff are also looking at developing additional visual aids for use during the broadcasts.

The PID added that, in retrospect, he would also have conducted an actual news conference. The media still had many questions and requested interviews with Public Affairs. The EOC Operations Manager said that staff might not have had to spend as much time as they did on individual interviews if spokespeople had been available through a formal news conference. Any future use of Facebook Live will be done in tandem with news conferences and briefings, she said. The PID added, "I feel like we needed to do a better job balancing social media with traditional media." He acknowledged that some key audiences within the Hanford area still heavily rely on traditional news outlets.

CONCLUSION

Learning to understand and master the use of social media is one key aspect to ensuring that public affairs staff have the necessary tools and resources to conduct an efficient and effective EPI operation. The Hanford Site emergency in May 2017 is just one example of how the proactive use of social media, in conjunction with traditional communication and messaging strategies, can be an asset during a response to provide timely and accurate information to the public and media.

As one member of the Hanford Public Affairs team succinctly stated, "This event really underscored the importance of social media. It showed how important social media has become in our society today. It is one of our primary tools for communicating."

Two pieces of anecdotal information provided in the course of this study point to the overall effectiveness and comprehensiveness of the Hanford EPI operation. First, despite the widespread and in some cases alarming media coverage, by the end of the first day there were no inquiries about health impacts as a result of the tunnel collapse, indicating that the essential safety messages were received and well understood by the public. Second, only one Freedom of Information Act request has been filed since the conclusion of the event, pointing to the breadth and depth of the information provided by Hanford Public Affairs.

DOE/NNSA facilities have had mixed results in mitigating public and media responses to emergency situations over the past decade. From the breach of the Y-12 National Security Complex by activists in 2012 to the numerous wildland blazes that have threatened sites in Idaho and New Mexico in recent years, there is no shortage of possible scenarios under which the department and its facilities could face scrutiny. The steps taken by and lessons learned from the Hanford Site can provide a template for other DOE/NNSA facilities to follow in managing future events.

SUMMARY OF KEY OBSERVATIONS

Facebook Live: Because of technical issues with the audiovisual equipment used in news conferences, Hanford Public Affairs staff elected to conduct media briefings via Facebook Live. The briefings/broadcasts were highly successful. They received thousands of views and comments, and numerous news agencies used the information from the broadcasts. Staff indicated that each broadcast was a learning experience; adjustments were made in appearance, delivery, logistics, and resources. Hanford will acquire additional equipment, conduct training, and incorporate the use of Facebook Live into future events. It is important to note that staff did not believe Facebook Live was an adequate replacement for news conferences; the two should be used in tandem to support emergency public information efforts.

Initial Notifications: Due to the large number of employees who have smart phones—and who reach out to the media and public during emergencies and may have pre-existing relationships with local reporters—staff indicated that they were forced to play catch-up as the media quickly reported information obtained from internal Hanford sources. EPI staff are looking at ways they can increase the amount of information they provide during the initial notification to better inform employees—and by extension the public and media—about essential event information. In preparing for future events, EPI planners should assume that offsite public and media will have access to information pertaining to emergency events in almost real time.

Information Approval: Staff spent an inordinate amount of time monitoring social media and taking phone calls, which created a backlog in their ability to respond to inquiries with approved information. This was because there were not enough people available to assist with the information approval process. Staff are looking at how information is managed and approved to ensure that adequate resources are available to support this vital function.

Headquarters Coordination: Although Hanford and DOE Public Affairs indicated that local staff have the authority to release event information without DOE/NNSA approval, more and better coordination with Headquarters—and similarly, among the various offices within Headquarters—could have improved the overall response. The volume of individual queries from Headquarters staff at times overloaded Hanford resources. Hanford has since added additional staff to communicate with Headquarters during emergencies to provide the most current, up-to-date information in a manner that does not hinder local communications.

Staff Cross-Training: Like many JICs, Hanford is three-deep in most of its positions; however, staff indicated it would have been helpful to have had more people on the first day due to the volume of queries. Staff are looking at cross-training, particularly in areas of impact like social media monitoring, to ensure adequate resources are available during the critical early phase of a response.

EXAMINATION OF LESSONS LEARNED AND BEST PRACTICES

With increasing frequency, audiences today go directly to the internet to receive news updates and emergency information. Social media is now the fourth most popular medium for accessing disaster information [1]. Social media is defined as forms of electronic communication through which users create online communities to share information and other content [2]. The use of social media has a major impact on emergency response. Social media shapes how crises are communicated, and how responses are coordinated. It provides new and accessible communication platforms that offer the opportunity to reach more people with customized information faster than ever before. It is a proven and invaluable resource for emergency response [3].

Social media technologies are the standard for information dissemination [4] and can enhance an agency's efforts to diminish the impact of disasters on life and personal property. Social networks can be used as notification systems, as ways to gather emergency information, as important tools in recovery efforts, and as information repositories to serve the public and responding agencies. Implementing social media and digital technologies in emergency management plans, particularly as part of response, is a proven and effective way to engage stakeholders, disseminate key messages, inform operational decision-making, and manage rumors and misinformation [5]. However, traditional means of information dissemination, like news conferences, must remain a complementary communication method, as noted by the Hanford Public Affairs team.

According to the Department of Homeland Security Science and Technology Directorate's *Operationalizing Social Media for Preparedness, Response, and Recovery*, to effectively integrate social media, digital tools must be included in the following: planning and strategy development; operational and procedural documentation; legal, security, privacy, and other related policies; education, training, hiring, and exercises; evaluation and assessment; standards development; private sector collaboration and technology development; and funding strategy [5]. The lack of a social media policy and strategy can hinder the use of social media for key messaging. A sound strategy that includes using social media channels along with a well-trained staff to manage and coordinate those resources will help ensure communications reach audiences with the critical information they need to protect themselves and others during an emergency. Importantly, social media can best be leveraged during time-critical response efforts if agencies have already established a history of trust.

As exemplified by the Hanford study, with the proliferation of social media, emergencies now unfold in real time on smartphone and computer screens. Although social media can be an excellent medium for communities to gather life-saving emergency information and experience the impacts of a disaster in a collective manner, there is also the concern that misinformation, rumor, and disinformation can flourish there [6]. Social media provides the capability to communicate directly with those impacted by an event, without having to rely on the media as intermediary. Everyone is a reporter, and everyone is an audience, as the Hanford Public Affairs staff identified with regard to employees sharing internal information with outside audiences. However, if response agencies do not take the initiative to develop a foundation of trust with employees and the public before an emergency, these groups will look to unofficial sources for their information. Likewise, if social media is not monitored and misinformation is not corrected in a timely manner, rumors, misinformation, and disinformation will run rampant [6]. Social media users are quick to fill any information gaps. The scientific adage that nature abhors a vacuum also pertains to the flow of information during a disaster—even if that information is inaccurate or misleading.

Social media provides an invaluable opportunity to bridge communication gaps and maintain preparedness and response. Technology tools such as social media also make collaborating easier by reducing inefficiencies and enabling new methods of working together remotely. Emergency response agencies can leverage these technologies to support efficient, consistent, and timely information management before, during, and after an emergency event. Technology such as social media also provides emergency management professionals the intelligence they need to make informed decisions while ensuring the safety and health of the public [7]. However, disaster response will continue to change as technology evolves, amplifying the need to ensure that well-trained staff are available to manage and coordinate emergency communications to provide audiences the critical information they need to protect themselves and others during disasters].

A sound social media strategy to support key messaging is important, but coordination of information flow with headquarters, partnering agencies, and other key stakeholders is imperative, in addition to providing strategic messaging via traditional methods of communication like news conferences, interviews, and websites. As noted in the case study, DOE Headquarters can assist in events like this by helping to mitigate strong international interest. Information flow is key to ensuring that internal stakeholders are empowered with the information needed to keep high-level decision-makers informed [8].

While the priority is always to provide timely and accurate information to the public and media, social media is not an exhaustive approach. Hanford Public Affairs identified the importance of other means of communication, and how such information dissemination can lessen the overall demands on public affairs staff. Strategic messaging is key, and multiple methods of communication should be used to relay impacts, or the lack thereof, to affected audiences. Ultimately, planning, preparation, training, and practicing are key elements for successful crisis communication. The Hanford Public Affairs team was better positioned to handle this emergency because of their forward-looking efforts prior to the event. This lessened the need to find ad hoc solutions for communicating strategically with the media and the public when the emergency occurred—although when unplanned-for circumstances did arise, staff demonstrated a strong ability to adapt and improvise to meet critical information needs.

KEY TIMELINE OF EVENTS

HANFORD PUREX TUNNEL COLLAPSE

MAY 9, 2017 – DAY 1	
8:06 a.m.	Discovery of subsidence of dirt over PUREX Tunnel 1.
8:26 a.m.	Alert-level emergency classified, warning sirens sounded, and employee notifications issued.
8:29 a.m.	KING 5 television reporter posts first social media message regarding the event.
8:37 a.m.	Operational Emergency is declared; Hanford EOC is activated.
9:05 a.m.	Emergency Information Event Summary webpage on the Hanford website is activated.
9:09 a.m.	Hanford posts notice to its official Facebook page directing the public to its emergency webpage, which initially does not have any information.
9:15 a.m.	Hanford EOC is declared operational.
9:25 a.m.	Hanford EOC contacts Headquarters Environmental Management (with frequent updates continuing over the subsequent two days).
9:39 a.m.	First post to Hanford's Emergency Information Event Summary webpage appears.
9:46 a.m.	Hanford provides a second notice on Facebook updating readers about the emergency.
9:48 a.m.	A similar notice is posted on Twitter.
10:18 a.m./10:27 a.m.	Hanford posts on Facebook that there is no confirmation of a tunnel collapse.
10:21 a.m.	Emergency is upgraded to Site Area Emergency.
10:49 a.m.	Hanford posts on Twitter that the PUREX tunnel has been breached.
Approx. 11:30 a.m.	First Facebook Live broadcast garners 111 comments and 197 likes. Hanford monitors and responds to comments in real time.
12:25 p.m.	Hanford posts on Facebook and Twitter confirming the tunnel collapse with photographs; first direct confirmation that no contamination detected.
Approx. 2 p.m.	Hanford conducts second Facebook Live broadcast; this broadcast eventually garners more than 700 likes, 1,200 shares, and hundreds of comments. Hanford monitors and responds to some comments in real time, but reviews the majority of comments after the live broadcast has ended.
6:07 p.m.	Hanford posts on Facebook and Twitter that workers are filling the hole with dirt. Follow-up comments include one from a worker who claims the collapsed tunnel was mitigated in less than 12 hours.
MAY 10 – DAY 2	
3:16 a.m.	Hanford provides update regarding employees' work schedule for the day.
3:56 a.m.	Hanford posts on Twitter and Facebook showing videos of workers filling the hole at the PUREX tunnel.
Approx. 6:30 a.m.	First Facebook Live broadcast of the day, updating the status of the response. This broadcast has 171 likes, 195 shares, and multiple comments.
7 a.m.	Hanford posts on Twitter, reminding the public that no contamination has been found.
9:48 a.m.	Hanford posts photographs on Facebook and Twitter showing efforts to close the PUREX tunnel breach.
12:36 p.m.	Hanford posts on Facebook stating that officials still do not know what caused the collapse.
Approx. 3 p.m.	Second Facebook Live broadcast of the day, with 99 likes and 104 shares.
5:11 p.m.	Hanford posts on Twitter stating that nonessential employees will not report to work the following day.
11:21 p.m.	Emergency is officially terminated by Hanford EOC.

All times are in Pacific Daylight Time, unless otherwise noted.

HANFORD WEBSITE/ SOCIAL MEDIA STATISTICS

HANFORD.GOV WEBSITE ACTIVITY

(Note: Information Technology personnel added virtual servers and memory ad hoc to support the tremendous spike in usage)

- **Page views:** 2,028,334
- **Visits:** 317,380
- **Hits:** 10,458,623
- Visits from 85 countries around the world
- Visits from 8,029 cities around the world
- Visits from 6,859 U.S. cities

HANFORD FACEBOOK PAGE ACTIVITY

- **3,378:** new Hanford Facebook likes (up 33,550%)
- **23,344:** Facebook page views (up 38,169%)
- **700,413:** Hanford Facebook post reach
- **200,383:** post engagement
- **289,889:** video views

HANFORD TWITTER ACTIVITY

- #1 trending topic on Twitter in the United States on May 9, 2017 (until dismissal of FBI Director)

HANFORD YOUTUBE ACTIVITY

- **6,217:** YouTube views

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