

OSC Report for Macdona Derailment

Purpose

On November 23, 2004 Mark Mjones, Chair, National Response Team (NRT) Response Committee, formally requested submission of an On-Scene Coordinator (OSC) Report to the NRT Response Committee regarding the Macdona Train Collision, Chlorine Release and Response. The Response Committee specifically requested that the OSC Report address Incident Command Structure (ICS) implementation during the response and post-response follow-up with the Union Pacific Railroad (UP). Later communication from the committee indicated interest in interagency response coordination, Regional Response Team (RRT) involvement and whether there was an investigation by the National Transportation Safety Board (NTSB).

The basis given for the request was that the incident involved an unusual challenge, a unique or complex issue (e.g., intergovernmental coordination), a lesson(s) learned that should be made known regionally or nationally, resulted in fatalities and was ostensibly the largest chlorine release in US history. The NRT request is consistent with National Contingency Plan (NCP) requirements and internal guidance documents addressing such requests.

Supporting Documentation

The EPA incident website is <http://www.epaosc.net/macdonatrainderailment>. POLREPs, maps and other relevant documents are found there. Analysis of numerous issues is detailed within the EPA Emergency Response Review at http://www.epaosc.net/sites/726444/files/union_pacific_macdona_texas_response_review_final.pdf. Links to specific documents referenced in this OSC report are provided at the respective points of reference.

Incident Summary

At approximately 0503 hours on June 28, 2004 in the town of Macdona, Texas, a UP train struck a Burlington Northern Santa Fe (BNSF) train, resulting in a large derailment. The site is located in Bexar County, southwest of San Antonio. One chlorine car and multiple ammonium nitrate solution cars ruptured and released, and approximately 10,000 gallons of fuel were spilled from four wrecked locomotives. Three fatalities (two residential and one railroad) from chlorine exposure were confirmed, with at least 43 others treated and/or hospitalized. Many of the injured included first responders suffering from heat stress. The 60-ton release of chlorine appears unique for two reasons: (1) it may represent the largest chlorine release in U.S. history to that date, and (2) NTSB determined this to be the first documented head puncture of a chlorine car in transit.

USEPA Region 6 OSCs Harris and Leos responded with EPA-START contractors to provide overall response coordination using ICS with Unified Command

(UC). The UC structure included representatives from EPA, START, the Texas Commission on Environmental Quality (TCEQ), Bexar County and UP. The EPA Command Post was co-located with the TCEQ Strike Team. Extensive and regular press interaction was managed through the Public Information Officer (PIO) provided by Bexar County, with support from EPA External Affairs in Dallas.

A key operational function was offsite air monitoring for potentially affected areas. This was accomplished through an extensive network of mobile teams and fixed monitoring equipment using continuous telemetry. In addition to residents and response personnel, the monitoring network was designed to protect a nearby prison. On Day 3 a precautionary evacuation of residents was conducted while the chlorine car was being relocated away from the track. Offloading, monitoring and recovery operations continued around the clock for approximately two weeks, with no additional releases or impacts beyond the immediate work area.

Analysis of Major Issues

Initial 911 Notification and Response: Bexar County 911 received a call from a residence near the track at 0506 hours, three minutes after the derailment. Audio of that call may be found at <http://www.epaosc.net/sites/726444/files/koerber2.mp3>. The caller reported a loud noise at the rail crossing, followed by white smoke “everywhere” and difficulty breathing. She specifically mentioned four times in two conversations that she suspected a train derailment. However, the 911 operators apparently misunderstood and dispatched First Responders on a medical call related to smoke. Audio of that call (a very large digital file) may be found at <http://www.epaosc.net/sites/726444/files/train%20derailment%20-%20so%20fire%20-%20telephone%20-%200507%20thru%200840%20-%2006.wav> at time stamp 2:55. Minutes later, the first-responding engine drove into the chlorine cloud and was nearly overcome. One responder on the engine went down and required rescue. It was during that rescue and exit that the incapacitated UP engineer was located on the side of the road and rescued. The two occupants of the home were later found deceased. During the EPA Emergency Response Review, it was determined that Bexar County 911 operators had no training in hazmat.

At approximately 0715 hours, the local IC ordered an evacuation of approximately 57,000 potentially affected residents. 911 personnel determined that their notification system was unable to perform this task, and internally chose to disregard the instruction from the IC without informing him of that decision.

Lessons Learned: (1) 911 operators must have training to understand and respond to hazmat incidents. (2) Instructions to notify for evacuation must not be disregarded without consultation with the IC giving that instruction. Refer to the referenced Emergency Response Review for additional analysis of these lessons.

Initial Bexar County 911 and UP Contact: Upon realizing that the incident was not routine, Bexar County 911 contacted UP at approximately 0526 hours. Audio of that call (a very large digital file) is found at <http://www.epaosc.net/sites/726444/files/train%20derailment%20-%20so%20fire%20-%20telephone%20-%200507%20thru%200840%20-%2006.wav> at time stamp 18:23. The UP operator advised 911 of a “possible train-on-train,” that chlorine might be involved, the specific location of the chlorine car on the UP train, confirmed that there was no hazmat on the BNSF train and that contact with the UP crew was lost. UP was then advised by 911 that “several fire units are in the area,” that “we have one firefighter down from it,” and that “several other civilians that are calling in sick from it.”

Lessons Learned: Upon suspecting a potential hazmat incident, Bexar County 911 correctly took the initiative to contact UP. The information gained and disseminated to First Responders may have prevented additional casualties.

National Response Center (NRC) Notification: At 0612 hours, approximately 45 minutes after the initial Bexar County/UP conversation ended, the NRC received a call from UP indicating only that two trains had collided, with no cars derailed, causing an unknown hazmat release. According to the NRC Report relevant information such as impacts, actions being taken, the type and the amount of hazmat present or released was reported as “unknown” by the UP caller. This, despite the relatively detailed information already exchanged between Bexar County 911 and UP. NRC Report #726444 is found at <http://www.epaosc.net/sites/726444/files/nrc%20726444%20%20-%20macdona%20train%20derailment.doc>. No audio of the NRC notification is known to exist outside of perhaps UP, as the NRC reportedly recycles tapes after approximately 60 days.

Lessons Learned: (1) The NRC Report does not reflect the amount and type of information apparently possessed by UP at the time of the notification. That lack of information forced the EPA Phone Duty Officer to expend valuable response time researching and collecting information already known to others. (2) Make immediate efforts to secure audio from the NRC for any call(s) thought to be relevant for future use. Discussions with the NRC indicate that within several months current system upgrades will produce digital audio records, which can be stored indefinitely and easily transferred electronically. The NRC advises that they are considering sending that electronic file along with each respective report, a very good idea that would eliminate the obvious issues with recycling tapes.

UC/ICS: Initial reports from the scene indicated conflict and confusion between First Responders regarding incident command. Upon arrival, OSC Harris was briefed by San Antonio Fire Department (SAFD) personnel reportedly acting as the lead agency at that time. SAFD advised that their agency would demobe immediately following the conclusion of body recovery and search operations, requiring the implementation of a revised command structure. OSC Harris immediately began developing a UC structure representing the agencies and personnel expected to continue operations. At that time,

the senior UP official at the scene informed OSC Harris that UP would neither participate in any formal command structure nor take direction from anyone. He was adamant that UP already had a plan and a schedule, and that all activities at the scene of the accident were, and would remain, under the sole purview of UP. OSC Harris clarified for the UP official that the pending Unified Command would be the decision-making body for the remainder of the operation, and again requested their participation and cooperation in that structure. He refused several times, but after repeated discussions eventually agreed to be their designated UC representative. Communication and implementation of the formal UC structure began that evening.

The formal UC structure was fully implemented by Day 2. However, the UP representative and a designated stand-in repeatedly would not or could not make themselves available for operational briefings or planning meetings. It was eventually necessary to approach UP regarding the lack of participation of their designated representatives. The mutually agreeable solution was replacement. The revised structure is found at <http://www.epaosc.net/sites/726444/files/iscorgchart070404.wpd>. Later on Day 2, UP advised their intentions to relocate the chlorine car to facilitate reconstruction of the track and return to service. The initial plan agreed to by the UC involved extensive preparation, enhanced safety and monitoring and a precautionary evacuation of residents. Due to schedule interruptions and foul weather the designated window of opportunity was lost, and the proposed operation was terminated by the UC.

UP later advised their intentions to proceed with relocation during the night. Field Teams had already advised the UC that all remote monitors were potentially blinded by rain, and that only limited data was available through the use of hand-held, colorimetric tubes. Modeling indicated that a potential release would reach still-occupied homes within four minutes, effectively precluding any protective measures following an unexpected release. The UC determined that the best option was to wait until the following day and implement the original plan under safer, more controlled conditions. The UP official advised that he felt that the UC was being too conservative. However, with the exception of UP the UC was in concurrence that moving the unstable rail car in an uncontrolled manner, with no monitoring capability and no warning time for downwind residents, posed an imminent and substantial danger to public health, and would not be allowed. UP advised their intentions to proceed without UC approval and against the specific direction of OSC Harris. The UP official then requested that OSC Harris advise him as to "the worst-case scenario" for UP in that event that they disregarded that direction. OSC Harris advised him that should it become necessary to forcibly restrain those activities, a U.S. Marshal would be requested to take the UP official and/or others as necessary into custody, at which point EPA would take direct control of all site activities, remove non-essential personnel from the site and continue as appropriate to the logical conclusion of operations, at which time the rail line could reopen. The UP official methodically, but politely, questioned OSC Harris as to his legal authorities and his willingness to pursue such interventions. Following an explanation of NCP authorities and his "sizing up" of the determination of OSC Harris to stand by this decision, the UP official indicated that he would take all of this under advisement and pass it on to his manager. The senior UP official arrived at the Command Post shortly

and, following additional heated discussions, reluctantly agreed to wait until morning to implement the original work plan. That successful operation is described in POLREP #4, found at http://www.epaosc.net/polrep_profile.asp?site_id=726444&counter=1462.

Lessons Learned: (1) The immediate development and implementation of a Unified Command structure clearly aided response efforts and enabled good decision-making. (2) The resistance of UP officials to both EPA authority and the UC created unnecessary drama. All OSCs must be intimately familiar with the specific authorities available to them to deal with such situations and be prepared to follow through as necessary to protect public health and the environment. (3) Private organizations and their contractors who may be part of emergency response activities must become familiar with NCP authorities, NIMS, the NRP and integration into ICS/UC environments.

Follow-up with UP: Region 6 EPA conducted the referenced Emergency Response Review with all involved organizations. San Antonio has scheduled an extensive functional exercise that will focus on the use of Unified Command, NIMS and the coordination of multiple responding agencies. EPA and UP are participating in that exercise, scheduled for March 1-3, 2005. Any potential enforcement actions that may or may not be under consideration by EPA are outside the scope of this document.

Lessons Learned: The immediate follow-up exercise led by San Antonio and Bexar County is an excellent way in which to revisit the lessons learned from the incident and improve capability and interoperability.

Federal Agency Coordination: EPA interaction with the NTSB and the Federal Railroad Administration (FRA) was limited, as NTSB conducted ongoing investigative activities at a hotel, not at the site, and did not involve any EPA personnel. Attendance by EPA at NTSB briefings was permitted by them, but generally proved infeasible due to demanding response activities, the rigid NTSB briefing schedule and the need for EPA personnel to travel offsite to attend those briefings. Despite repeated offers by OSC Harris, NTSB expressed no interest in ongoing EPA activities and never attended scheduled UC operational briefings or planning sessions. As a result it was difficult to effectively contribute to, or benefit from, their process or maintain flows of information without EPA interrupting critical duties and leaving the site. Following conclusion of site activities, NTSB declined to participate in the EPA Emergency Response Review and later excluded EPA from participating in theirs. Interaction with FRA was even more limited, as EPA representatives only saw them briefly at NTSB briefings.

Lessons Learned: NTSB, FRA and EPA could have assigned representatives to the respective activities of other agencies. However, in addition to requiring additional personnel, the complexion of the NTSB/FRA activities appeared to OSC Harris to be designed to operate outside and independently of response activities. The potential value and scope of interaction between these agencies should be evaluated so that it may be effectively implemented with a minimum of resource demands. Should a closer relationship be desired, key personnel must be co-located in order to maximize interaction and minimize competing goals and schedules.

Coordination with Others: Cooperation and coordination between EPA, State and local response agencies was excellent. OSC Harris requested and received the support of a large contingent of the TCEQ Strike Team for the duration of the event. They provided multiple benefits by being able both to support UC activities and manage the variety of compliance and site recovery issues outside of the immediate needs of the chlorine response. During the initial days of the response, the UC operated out of the TCEQ Command Post (CP). Co-location proved very useful; however, briefings and other meetings quickly overwhelmed the limited space available in the CP. EPA secured additional facilities adjacent to the data management and operations areas of the initial CP, which allowed separation from activities distractive to technical personnel.

Lessons Learned: The TCEQ Strike Team was invaluable to the operation. They provided both logistical and regulatory compliance support, and operated comfortably inside the UC structure.

RRT Involvement: No specific RRT actions were requested by the responding OSCs. During the initial phases of the operation, thorough briefings were conducted by telephone conferencing twice daily with Regional and HQ personnel and other agencies.

Lessons Learned: EPA support at HQ and the Regional Response Center (RRC) in Dallas was constant, effective and adequate. Had RRT support been necessary, the R6RRC has a well-documented process in place to convene that body immediately.

NTSB investigation: The NTSB (<http://www.nts.gov/>) conducted an investigation into this event. EPA OSC Harris participated in the initial visit to the site by the investigation team on July 02. By the time of that visit, site work had resulted in the removal of all cars and debris except for the chlorine car, which had been relocated away from the track and was in neither its original position nor condition. Although not a substitute for direct observation, EPA was later able to provide NTSB with high-resolution photos obtained by ASPECT during the initial hours of the incident and prior to any physical interventions. To date, the final NTSB report has not been published.

Lessons Learned: (1) Significant material evidence was lost due to the delay of the investigation team in visiting the site. The site could have been safely entered by the Team days sooner and prior to any interventions. (2) The availability of high-resolution digital photographs captured by ASPECT was fortuitous for investigators, as EPA was the only Agency known to have produced such images. ASPECT generates detailed images as part of every deployment. This documentation and its potential use by responders and investigators is a resource to our own efforts and even outside EPA, as was the case here.

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