

Appendix O
Hazardous Materials Group Factual
Norfolk Southern Timeline and Comments



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Environmental Protection
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Mr. James Henderson
Office of Railroad, Pipeline, and
Hazardous Materials Investigation
National Transportation Safety Board
490 L'Efant Plaza East, SW
Washington, DC 20594

September 8, 2005
Ref: DCA 05 MR 008
File: 1-9-SC-GRNV-D19414

Dear Mr. Henderson:

Following are Norfolk Southern's comments on the apparent timeline discrepancies. These comments are based on discussions with Chip Day, who was the Senior Hazardous Materials Project Manager for Hulcher, the contractor hired by Norfolk Southern to handle the emergency response. Mr. Day referred to his field notes during these discussions. At the present time Mr. Day, who now works for NS, is in New Orleans on hurricane response duty. We will endeavor to secure a copy of his field notes if you need them, but they are with him in New Orleans. We received no communication with respect to the timeline from any of the other individuals who received your September 2 e-mail. The revised NS timeline will be sent to you by separate email.

1. Mr. Day confirmed that the phase one of transferring the contents of SBLX 14146 began at 12:10 PM on January 10 (not the 11:45 PM time frame in the NTSB timeline) while the second phase of the transfer of SBLX 14146 started at 11:30 AM on January 11. (Previous reference to January 12 for this second phase activity was a typo, and the NS timeline has been corrected.) Mr. Day also confirmed that the offloading of SBLX 14146 was completed at 2:00 PM on January 11, not at 4:30 PM (1630) as the NTSB timeline indicates. The 2:00 PM time is the correct time.

2. Regarding the application of the steel permanent patch to UTLX 900270, Mr. Day advises the first bolts were attached to the car at 3:00 PM on January 11, which started the process of applying the steel patch to the car. The process of applying the bolts and installing the steel plate to UTLX 900270 was completed on January 12 at 9:30 AM. (The NS timeline will be corrected to reflect the foregoing.)

3. Regarding the time when the pressure rise caused the wreck clearing to be suspended on January 13, Mr. Day advises the time of 2:30 PM is correct. Presumably it took a while for the information about the pressure rise to be relayed to those at the Command Center, which might explain the NTSB's later 3:00 PM time reference. The 2:30 PM time is correct.

4. According to Chip Day and his notes there was no more liquid chlorine remaining in UTLX 900270 as of midnight on January 18. Mr. Day opines that the NTSB reference that the "chlorine" transfer ended 9:00 AM on January 19 likely relates to the fact the testing of the grams per liter ("gpl") of available sodium hydroxide (caustic) in the frac tank (which testing was first done at 1:00 AM on January 19, and thereafter at 3:00 AM, 5:00 AM, 7:00 AM and 9:00 AM) continued to show no change and remained at 76 gpl of caustic at all five testing times. The NS timeline earlier reference to 1:00 AM simply reflected that there was no frost left on the car at midnight, which was confirmed by the 1:00 AM testing and the subsequent four testings.

5. The inadvertent misidentifications of UTLX 900270 as a GATX car in the NS timeline will be corrected. In reviewing the car numbers, we point out the NTSB timeline misidentifies SBLX 14146 the car as SPLX 14146 under the January 10 and 11 headings. We also corrected the NS timeline to reflect completion of the chlorine transfer in GATX 17105 at 2:10 PM on January 12 rather than 2:10 AM (corrected typo).

NS offers these additional comments on the draft NTSB hazmat timeline.

1. For the January 6 at 1600 heading, while the EPA SITREP #2 may say what is said in the NTSB hazmat timeline (that an estimated 70% of the contents were released immediately), in fact approximately 50% of the contents of UTLX 900270 was released (the actual calculated figure of 46 tons being released from the 90 ton car). The vast majority of the release occurred within an immediate time period, but sporadic vapor releases did occur until application of the permanent steel patch to the tank car.

2. January 8, 1900 heading: The term "frac tank" should be defined and its use in this case explained as follows: "A frac tank is a 21,000 gallon portable storage tank. In this case, the chlorine vapor that had been extracted from UTLX 900270 through the application of heat to the car shell (which thereby flashed the liquid chlorine to a gas) was piped into the frac tank where the gas mixed with the caustic to convert the material into a weak bleach product that could be safely handled. Three frac tanks were used in this process."

The foregoing also relates to the January 16 1200 heading. The second sentence should read as follows: "Sections of the jacket and the insulation covering the tank heads had been removed so heat could be more readily applied to the tank car shell to facilitate the conversion of the liquid chlorine to a gaseous state so the gas could be piped to the frac tanks for reacting with the caustic."

NS appreciates the opportunity to address these discrepancies, and hopefully the NTSB will find our response sufficient for its purposes.

Sincerely,

A handwritten signature in dark ink, appearing to read "P. Williams", is written over a solid black rectangular redaction box.

Paul B. Williams
Asst. Mgr., Hazardous Materials

Cc: Richard Downs, NTSB
C. J. Wehrmeister
F.M. Caudill
R. P. Russell
A. G. Jordan

Emergency Response Timeline by Norfolk Southern Railway Company ("NS")

Accident at Graniteville, SC January 6, 2005

The January 6 portion of following summary is based primarily on the transcripts of the tape-recorded calls placed or received by the NS Greenville Dispatching Office ("NS-Dispatch") and the NS Police Communications Center ("NS-PCC") on January 6, 2005, as well as documents relating to the January 6, 2005 accident at Graniteville, SC provided to the NTSB by NS. This portion summarizes communications by the NS-PCC and NS-Dispatch to activate emergency response and to provide responding parties and other government agencies with available information. A copy of these transcriptions and the wheel report for Train 192 referenced below is being emailed to the NTSB as separate attachments to this summary.

The times noted on January 6 are approximate since the time clocks on the tape-recording systems for NS-Dispatch and NS-PCC appear to differ by approximately 5 minutes. For example, there is a call recorded on both taping systems that occurs at 2:41:16 on the dispatching tapes and 2:36:10 on the PCC tapes. In order to put events in order, PCC times were converted to dispatching times in the "Time" column below.

The balance of the summary (January 6-19) is based largely on discussions with NS outside contractors and their field notes as well as the EPA's Situation Reports, which comprehensively itemize the various response actions taken on a daily basis between January 6 and 19 by NS, the NS contractors and the involved agencies. NS and its contractors worked in very close coordination with the EPA, the South Carolina Department of Health and Environmental Control, the Aiken County Sheriff's Department and the local fire departments, among others, under the Unified Command structure during the emergency situation.

Thursday, January 6, 2005

Time	Event(s)
Approx. 2:38AM	Crew member of Train 192 notifies NS-Dispatch that Train 192 has collided with a standing train located on the siding at Graniteville, SC, requests an ambulance, and says he thinks he is bleeding. There was no mention of a release of any chemical or that any cars had derailed.
Approx. 2:39AM	NS-Dispatch calls NS-PCC to report the collision and possible injury.
Approx. 2:40AM	NS-PCC calls Aiken County Sheriff's Department, reports accident, and requests EMS response.
Approx. 2:45AM	Aiken County Sheriff's Office calls NS-Dispatch about possible derailment, says fire department en route to the scene, also says someone has reported a chemical spill, with no details.
Approx. 2:58AM	Bath Fire Department calls NS-PCC, reports accident and some kind of chemical spill, states that people cannot get close enough to trains to identify numbers or contents, and requests a list of hazmats on train. NS-PCC faxes 3-page scanned consist to Bath Fire Department. Consist which details car numbers and contents, is hand delivered to Fire Chief Napier by

	the Bath Fire Department.
Shortly before 3:00AM	Copy of wheel report for Train 192 faxed to NS-Dispatch (Piedmont) by Transportation Clerk in Nixon Yard in Augusta; wheel report identifies car contents and emergency information. (Copy of wheel report attached.)
Shortly after 3:00AM	The above Transportation Clerk speaks on the phone with Fire Chief Napier and identifies exactly what is in cars of Train 192 and where they were in the train.
Approx. 3:04AM	EPD on-call hazmat person notified by NS-PCC of accident.
Approx. 3:16-3:18AM	NS-PCC attempts to reach Aiken County 911 and Aiken Sheriff's Department, but gets no answer.
Approx. 3:18AM	NS-PCC calls South Carolina Highway Patrol for update on the crew, reports that county is not answering non-emergency lines, advises that hazmats on the train include chlorine and sodium hydroxide, and then faxes 3-page scanned consist to South Carolina Highway Patrol.
Approx. 3:25AM	CTEH contacted by NS Industrial Hygienist to fly to scene ASAP.
Approx. 3:29-3:33AM	Aiken County Sheriff's Office calls NS-Dispatch, requests NS to send its HAZMAT team, advises that Aiken County, Fort Gordon, and Savannah River Hazmat teams are responding, reports that the Sheriff's office is evacuating a large area and that there are people trapped in a mill. NS-Dispatch conveys foregoing information to NS environmental response personnel.
About 3:30AM	Supervisor Special Agent from Columbia and Terminal Trainmaster from Augusta arrive at first Command Center at the Honda parking lot in Aiken. Supervisor Special Agent gives a copy of the one-page consist to either Chief Napier someone working with the Fire Chief. The above Terminal Trainmaster, who had brought the one-page consist with him, was told by Fire Chief Napier that he already had a copy of the train information.
Approx. 3:34AM	NS-Dispatch reports accident and train contents to CHEMTREC.
Approx. 3:39AM	NS-PCC gets through to Aiken County Sheriff's Office, which advises that fire units on scene are reporting release of sodium hydroxide and that workers are trapped in the mill.
Approx. 3:41AM	NS-Dispatch notifies South Carolina Department of Health and Environmental Control ("DHEC") of accident and unknown release.
Approx. 3:54AM	Unidentified caller (presumably fire department person) called CHEMTREC to report derailment, injury and sodium hydroxide leak.
Approx. 3:58AM	South Carolina DHEC calls NS-Dispatch to confirm information DHEC has received so far on accident.
Approx. 4:00AM	Another trainmaster hands copy of consist to Aiken County Sheriff's Deputy at Command Center.

Approx. 4:00AM	NS Atlanta Control Center reports derailment and hazmat release to the National Response Center (suspected chlorine).
Approx. 4:10AM	NS environmental employee speaks with CHEMTREC about possibility that release could be chlorine and relays there is a cloud; CHEMTREC advises that CHLOREP already has been activated and is on the way.
Approx. 4:25AM	Unidentified local sheriff's department reports to NS-PCC that the release is sodium hydroxide and creosol.
Approx. 4:30AM	Hulcher Services, Inc., contacted by NS Mechanical to come to derailment scene and bring its hazmat team based in Atlanta.
Approx. 4:36AM	Hepaco is called by EPD to respond ASAP. Hepaco crews dispatched from Augusta, Atlanta, Charlotte, Ashville, Charleston and Birmingham.
Approx. 4:40AM	R.J. Corman Railroad Group (derailment services) called to respond to derailment. First unit (called at 4:40 AM) arrived from Atlanta about 9:30 AM. Second replacement group from Nashville called at 11 AM and had ETA of 7-9PM.
Approx. 4:48AM	CHEMTREC calls NS-Dispatch to advise all shippers notified.
Approx. 4:51AM	EPA contacts NS-Dispatch, indicates that EPA already has been talking with NS environmental personnel about accident.
Approx. 4:55- 5:00AM	NS-Dispatch faxes 12-page list of hazardous materials on Train 192, with emergency hazmat information on chlorine and sodium hydroxide, to Aiken County 911.
Approx. 5:00AM	Supervisor Special Agent arrives at the Command Center at K-Mart to provide additional assistance.
Approx. 5:03AM	NS environmental employee faxes over 37 pages of information (including train consist and emergency information) to Aiken County 911.
Approx. 5:15AM	NS environmental employee called Aiken County 911 to confirm receipt of consist and emergency information. Told no evacuation and local population told to stay in place, with emergency personnel to assist them out. Command Center reported green cloud observed and strong "Clorox" smell.
Approx. 5:22AM	NS environmental employee updates CHEMTREC and reports emergency responders are advising the railroad that the chemicals leaking were sodium hydroxide and creosol.
Approx. 5:28AM	NS environmental employee faxed consist to Hepaco.
Approx. 5:30AM	NS environmental employee calls CHEMTREC and requests reactivation of Chlorep because of reports of a chlorine smell in air. Was advised Chlorep never stepped down.
Approx. 5:45AM	The Hepaco crew from Augusta was first NS outside contractors to arrive. The remaining crew members arrived on site throughout the day.
Approx. 5:50AM	Hulcher again called by NS EPD and requested to send additional hazmat response personnel and supplies for probable chlorine leak ASAP to scene; Hulcher also bringing contractor Specialized Response Solutions.

Approx. 6:16- 6:20AM	South Carolina DHEC informs NS-PCC that there are reports that chlorine was released in the accident. NS-PCC calls Aiken County Sheriff's Office to report what DHEC had reported to it. Aiken County responds that it has not heard of a chlorine release but advises that residents have been told to stay inside and close windows, doors and ventilation systems and that decontamination centers have been set up.
Approx. 6:24AM	NS-Dispatch receives call from FRA in Atlanta, which requests additional information about the accident; NS-Dispatch offers to fax a consist, advises FRA that emergency responders have not been able to get close enough to confirm what has been released, but advises that a chlorine release is suspected.
Approx. 6:24AM	Aiken County 911 advises NS-PCC officer that there have been no reports of a chlorine release.
Approx. 6:26AM	Contractors Hepaco, additional Hulcher personnel and SRS and shipper Olin on the way to scene. Approx. 6:25 AM the State Warning Point Number was called by NS.
Approx. 6:57AM	Department of Homeland Security, Transportation and Security Administration in Herndon, VA calls NS-Dispatch to find out the chemicals and quantities released. NS-Dispatch advises that it is unclear what is being released because no one can get close enough to the scene, but that it is possibly chlorine or sodium hydroxide.
Approx. 7:00AM	A NS Special Agent and Aiken County Fire Department responders, all using proper PPE, arrive at actual wreck site. Jumble of wreckage makes it difficult to determine which car is leaking.
Approx. 8AM	Source of leak determined to be ninth car in consist.
9:00AM	NS advised by shipper through CHEMTREC that green cloud must be chlorine and not from rosin residue tank car.
9:00AM	Hulcher derailment services and hazmat team from Atlanta arrive at Command Center (old K-Mart).
9:08AM	CTEH arrives at Command Center.
10:00AM	Evacuation/shelter in place orders issued by local emergency management officials.
10:09AM	After reviewing Governor's video taken from helicopter ride of scene, Hulcher four-man hazmat team from Atlanta enter site in Level A protection to recon wreckage scene to take pictures and to render advice to the authorities in determining best response approach.
10:15AM	CTEH establishes air and meteorological strategic sites around incident scene to transmit data to CTEH's "central control".
10:30AM	EPD HQ staff, the Chlorine Go-Team and supplies dispatched from Roanoke to Augusta, GA by corporate jet along with Claims personnel; NS Hazmat Trailer mobilized from Roanoke.
10:50AM	Call to CHEMTREC from Eisenhower Medical Center; request information on chlorine.
12:00- 1:00PM	Hepaco hazmat crew in proper PE recon wreck site to conduct survey and take photographs and video for evaluation of situation by emergency responders. Noted fuel oil leak from locomotive.

2:00PM	Additional Hulcher hazmat team arrives at K-Mart Command Center. NS Go Team from Roanoke arrives about 2:30 at the Command Center.
3:30PM	Hulcher High hazard Team in Level B PPE enters site to check tank car pressure and perform initial "hands on" damage assessment of the three derailed chlorine tank cars.
4:00PM	Hepaco placed and monitored boom in Horse Creek to limit impact of diesel fuel that had spilled after the derailment.
4:45PM	Hulcher High Hazard Team meets with NS staff to discuss course of action.
8:30PM	Work Plan approved by NS, State and local agencies to apply a temporary patch while a permanent patch was built.
11:00PM	Hulcher supervision enters site in Level B PPE to uncouple upright cars from derailed cars.

Friday, January 7, 2005

1:30Am	Wreck clearing operations begin.
7:00AM	Meeting held with authorities to discuss ways to better coordinate site activities and secure consensus on appropriate response action.
11:00AM	All work at site stopped so local fire department could enter site for search, rescue and recovery efforts.
9:15PM	Response efforts resumed.

Saturday, January 8, 2005

7:00AM	Local fire department recovery efforts still ongoing. No wrecking or patching work allowed.
11:30AM	Response operations resumed.
12:00PM	CTEH begins remediation. Surface water monitoring starts.
7:00PM	Transfer begins on GATX 58326 (sodium hydroxide) car.
8:50PM	First temporary patch to stop leak from breeched GATX 900270 applied, but it subsequently fails.

Sunday, January 9, 2005

12:00-2:59AM	Wrecking operations ongoing to move damaged chlorine cars to reposition for transfer.
3:00AM	Work stopped due to chlorine release from damaged chlorine tank car GATX 900270.
3:37AM	Second temporary (poly) patch applied to UTLX 900270.
7:00AM	NS and Hulcher meet to discuss release and future damaged car-positioning tactics.
3:00PM	Hulcher work stopped to allow access to county's 911 switch to assess and photograph possible damage.
3:30PM	Transfer of GATX 58326 (sodium hydroxide car) completed into tank truck and then frac tanks. The plan was to sparge the chlorine by negative pressure from the damaged car in the sodium hydroxide to form bleach to allow for removal of a stable product from the site.
5:00PM	Hulcher re-enters site to continue wrecking operations.
7:00PM	Contractors over several days add lime-slurry to incident scene area to aid in preventing chlorine release from the soils near the damaged chlorine rail

	car.
9:30PM	Hulcher derailment services operations shut down due to impending renewed patch efforts on leaking chlorine car.
Time Uncertain	Fish kill reported in Langley Pond by fish believed to have washed downstream from Horse Creek.

Monday, January 10, 2005

6:30AM	Hulcher starts to move damaged chlorine car UTLX 900270 to more stable location. Car moved by 9 AM.
8:30AM	Hulcher operations stopped to allow chlorine fumes from damaged car to dissipate.
9:30AM	Jet pump on holed chlorine car fails. Pump replaced and operations resumed.
10:00AM	Hulcher returns to wrecking operations.
4:00 - 7:00PM	Work on resetting patch to minimize leak potential.
7:00PM	Permanent steel patch being built to plug breached UTLX 900270.
8:00PM	Hulcher (derailment services) operations shut down for evening while transfer of product from SBLX 14146, a non-leaking, but derailed chlorine tank car, begins. Transfer is done in two phases: phase 1 at 12:10 pm on January 10 and phase 2 at 11:30 am January 11.
Evening	Began working on Reoccupation Fact Sheet.

Tuesday, January 11, 2005

8:45AM	Hulcher returns and starts tie down operations on damaged rail cars removed from derailment.
9:00AM	Reentry Committee met to initiate the formalization of the reentry plan.
2:00PM	Transfer of chlorine from SBLX 14146 completed.
2:45PM	Hulcher repositions GATX 17105 upright and positions it for product transfer. SBLX 14146 moved.
3:00PM	First bolts attached to UTLX 900270 to commence process of applying steel permanent patch to the car.

Wednesday, January 12, 2005

1:10AM	Transfer of chlorine tank car GATX 17105 begins.
9:30AM	Process of applying bolts and installing steel permanent patch to UTLX 900270 completed.
2:10PM	Transfer of chlorine from GATX 17105 completed.
3:00PM	Hulcher resumes wreck-clearing operations.
7:00PM	Reoccupation Fact Sheet distributed to the public.

Thursday, January 13, 2005

12:00AM	Wreck clearing, track repair and loading up of damaged cars continue.
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8:30AM	Reoccupation begins in stages.
2:30PM	Wreck clearing operation suspended due to pressure rise in car into which product from UTLX 900270 (chlorine car with patch) was being sparged.
6:30PM	Hulcher holds meeting to discuss what caused the pressure spike and how to prevent future pressure spikes.
7:00PM	Work crews return to site and resume operations.

Friday, January 14, 2005

	Wreck clearing operations and chlorine transfer and site restoration continue.

Saturday, January 15, 2005

	Wreck clearing operations, chlorine transfer and site restoration continue.
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Sunday, January 16, 2005

	Wreck clearing operations and chlorine transfer continue.
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Monday, January 17, 2005

	Wreck clearing operations and chlorine transfer continue.
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Tuesday, January 18, 2005

8:00AM	Door-to-door inspections of remaining downtown Graniteville residences take place.
10:45AM	Hulcher derailment services personnel released.
Midnight	Chlorine vapor transfer from UTLX 900270 complete. No liquid chlorine remaining in car.

Wednesday, January 19, 2005

1:00AM	Begin purge of tank car UTLX 900270.
2:30PM	Purge of UTLX 900270 complete.
7:30PM	Hulcher hazmat crews released.
9:00PM	Hulcher derailment crew, who had returned from Atlanta for the load out of UTLX 900270, was released.