



NATIONAL TRANSPORTATION SAFETY BOARD  
**Investigative Hearing**

Norfolk Southern Railway general merchandise freight train 32N  
derailment with subsequent hazardous material release and fires,  
in East Palestine, Ohio, on February 3, 2023

<b>GROUP</b>	<b>B</b>
<b>EXHIBIT</b>	
9	

Agency / Organization

**NTSB**

Title

**Hazard Communications and  
Emergency Responder Preparedness  
For The Initial Emergency Response  
Group Factual Report**

National Transportation Safety Board  
Office of Railroad, Pipeline and Hazardous Materials  
Washington, DC 20594



RRD23MR005

**HAZARD COMMUNICATIONS AND EMERGENCY RESPONDER PREPAREDNESS  
FOR THE INITIAL EMERGENCY RESPONSE**

Group Chair's Factual Report

May 30, 2023

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## **SELECT ABBREVIATIONS AND ACRONYM NOMENCLATURE USED IN THIS REPORT**

CAD	Computer Aided Dispatch
CFR	Code of Federal Regulations (see [Internet] <a href="https://www.ecfr.gov/">https://www.ecfr.gov/</a> )
EPFD	East Palestine Fire Department
EPPD	East Palestine Police Department
FRA	Federal Railroad Administration (see [Internet] <a href="https://railroads.dot.gov">https://railroads.dot.gov</a> )
n/a	not applicable
NS	Norfolk Southern Railway
OH	Ohio [State of]
PSAP	Public Safety Answering Point <sup>1</sup>
ref	reference, or in referenced to
RPH	Railroad, Pipeline, Hazardous Materials [NTSB context]
ROW	right-of-way [in the context of railroad trackage]

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<sup>1</sup> Such a facility or operation is also referred to as a Public Safety Answering Point (PSAP), as further described in [Internet] <https://www.nena.org/default.aspx>.

## **A. ACCIDENT**

Location: East Palestine, OH  
Date: February 3, 2023  
Time: 8:54 p.m. local time  
UTC n/a  
Train: NS Freight Train 32N

## **B. HAZARD COMMUNICATIONS AND EMERGENCY RESPONDER PREPAREDNESS FOR THE INITIAL EMERGENCY RESPONSE**

### Technical Panel 1

Panel Chair	Troy Lloyd Railroad Accident Investigator (RPH-10) NTSB Washington, DC
Panel participants	Cyndi Lake, MPH, CEM Chief, Occupational Safety and Health Division (MD-7) NTSB Washington, DC
	Marc Dougherty Hazardous Materials Accident Investigator (RPH-20) NTSB Washington, DC
	Richard Downs, Jr., P.E. Mechanical Engineer (Crashworthiness) Sr. Survival Factors Investigator (Emergency Preparedness / Response) System Safety Division (RPH-40)

## **C. SUMMARY**

Refer to the *Accident Synopsis* in the docket for this investigation.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Relevant Background Factors / Information**

#### **1.1 Accident Scenario / Brief Summarized Characterization of the Event<sup>2</sup>**

The accident involved the derailment of 38 railcars of an eastbound Norfolk Southern Railway (NS) freight train, which occurred within the locality jurisdiction of the Village of East Palestine, Ohio. The derailment resulted in fire that ignited proximate to the derailed railcars at three separate locations along the track bed site, where the railcars came to rest. Emergency services resources of the locality jurisdiction (i.e., fire department, police, emergency management, etc.) were alerted and dispatched to the accident scene. Mutual aid emergency services resources were also requested to respond from adjacent jurisdictions, as well as West Virginia, to support the emergency services response at the accident scene. Hazardous materials<sup>3</sup> lading aboard the derailed tank cars was released and involved in the fire, which grew in intensity over time and resulted in sequential evacuations of both the civilian population and the emergency services responders. No injuries were reported in the initial emergency services response to the site.

#### **1.2 Topic-Points Examined by the Technical Panel**

- General timeline of the initial emergency response from the initial derailment to the establishment of a functional Incident Command Center.
- Coordination and communication efforts between response agencies, including the initial notification processes, including Hazmat response training as conducted by the NS and training received by the East Palestine Fire Department (EPPD).
- Hazard Communications on scene, placards affixed to the railcars, ability to obtain the train consist, and the evacuation of areas proximate to the derailment.

#### **1.3 Investigative Activities of the Technical Panel**

Recorded interviews were conducted by the Technical Panel with individuals of the various emergency services agencies that were involved in the response to the accident, and an official of an Ohio state agency. The interview recordings were transcribed, which are available in the docket of the investigation.

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<sup>2</sup> i.e., a summarized characterization, as specifically relevant to the examined topic-points as addressed by this Technical Panel (see § 1.2 of this report).

<sup>3</sup> The nomenclature "hazardous material(s)" is also sometimes referred to, by the commonly used vernacular, "hazmat".

## **1.4 Locality of the Accident / Civil Jurisdiction, and Property Identification**

### **1.4.1 Railroad**

The accident occurred on the NS main track number 1 of the NS Fort Wayne Line of the Keystone Division of the railroad, in which the derailed railcar wreckage came to rest<sup>4</sup> in an area that was proximate to railroad milepost<sup>5</sup> (MP) 49.2.

For information detail about the accident site, see the Track - Group Chairman's Factual Report, the Railroad Operations - Group Chairman's Factual Report, and the Hazardous Materials - Group Chairman's Factual Report.

### **1.4.2 Civil Municipality**

The accident site is within the emergency services jurisdictions of the municipal services agencies of the Village of East Palestine. The Village of East Palestine is a civil municipality of Columbiana County. The accident site is within the fire protection district of the East Palestine Fire Department (EPFD) and is within the law enforcement jurisdiction of the East Palestine Police Department (EPPD). The railroad track within the railroad right-of way (ROW) is owned and operated by the NS.

According to the Village of East Palestine community's website:<sup>6</sup>

*East Palestine is a community of approximately 5000 residents located on the Ohio-Pennsylvania border, one mile south of Route 14. It is within 50 miles of Pittsburgh, 85 miles of Cleveland and 20 miles of Youngstown. It was founded in 1875 and has a charter form of government.*

## **1.5 Site Characterization - Overall Physical Configuration**

### **1.5.1 Pre-Accident**

The NS rail line ROW, proximate to the accident site, consisted of a double track main, which is approximately level and straight and is aligned approximately in an east / west orientation. Both tracks of the main were comprised of a conventional gravel ballast railroad track bed and conventional track structure (i.e., steel rails affixed to wood cross ties). In this area, the distance between the centerline of the two tracks measured about 37 feet. Various industrial structures were situated on both the north and south sides of the ROW in this area. The NS rail line ROW

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<sup>4</sup> i.e., the dispersing derailed railcars resulted in a 'wreckage debris field' that was situated along the track bed at that location; see further § 1.5.2 Pre-Accident, and § 1.5.2 Post-Accident (below).

<sup>5</sup> A Milepost refers to point along the railroad line that identifies a dimensional distance, in miles, relative to the designated origin reference point.

<sup>6</sup> Ref: and for further information, see [Internet] <https://eastpalestine-oh.gov/>



geographically bisects the Village of East Palestine, in which residential neighborhoods are situated on both the north and south sides of the ROW. The Pennsylvania state line is about 100 yards to the east of the eastern end of the accident site approximate boundary.

For additional information detail, see the Track - Group Chairman's Factual Report.

### **1.5.2 Post-Accident**

On-scene evidence supports<sup>7</sup> that the derailment initially occurred at MP 49.5. The train continued to move eastward, which resulted in a wreckage debris field (i.e., a 'pile-up' of wreckage) that occurred in an area to the immediate east of the North Pleasant Drive at-grade highway / railroad crossing, and extended to the east, along the railroad ROW for a distance of about 1,200 feet.

The wreckage of the derailed railcars came to rest on the railroad ROW and on private properties adjacent to the railroad ROW. The derailment resulted in fire that ignited in several of the derailed railcars, at three separate locations along the track bed site where the railcars came to rest.

For information detail, see the Track - Group Chairman's Factual Report, and the Hazardous Materials - Group Chairman's Factual Report.

## **2.0 Accident Train - Owner / Operator**

### **2.1 Operational Background (Brief Summary)**

The accident involved a freight train operated by the Norfolk Southern Railway<sup>8</sup>, which was traveling on property of the NS and was operated by employees of the NS.

The NS website provides the following description of the company:<sup>9</sup>

*Norfolk Southern Corporation (NYSE: NSC) is one of the nation's premier transportation companies. Its Norfolk Southern Railway Company subsidiary operates approximately 19,300 route miles in 22 states and the District of Columbia, serves every major container port in the eastern United States, and provides efficient connections to other rail carriers. Norfolk Southern is a major transporter of industrial products, including agriculture, forest and consumer*

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<sup>7</sup> Ref; as described in the Track - Group Chairman's Factual Report.

<sup>8</sup> Ref: and for further information, see [Internet] <https://www.norfolksouthern.com/content/nscorp/en.html>

<sup>9</sup> Ref: and for further information, see [Internet] <https://www.norfolksouthern.com/content/nscorp/en/about-ns/corporate-profile.html>

*products, chemicals, and metals and construction materials. In addition, the railroad operates the most extensive intermodal network in the East and is a principal carrier of coal, automobiles, and automotive parts.*

For further information, see Railroad Operations - Group Chairman's Factual Report.

## **2.2 Documented Instructional Guidance, Compiled by the Railroad, to Address Hazardous Materials Release Event**

### **2.2.1 Pre-Accident**

The railroad made a copy of a document titled "HM-1, United States, Hazardous Materials Instructions for Rail", "Effective [revision date] January 1, 2019", available to the investigation.

### **2.2.2 Post-Accident**

The railroad made a copy of a document titled "HM-1, United States, Hazardous Materials Instructions for Rail", "Effective [revision date] April 15, 2023", available to the investigation.

## **2.3 Documented Instructional Guidance to Address Hazardous Materials Release Events - Made Available by NS to Jurisdictional Emergency Services Agencies**

### **2.3.1 Pre-Accident**

As described in interview transcripts of both the East Palestine Fire Chief, and the East Palestine Deputy Fire Chief, the railroad made a document titled "HM-1, United States, Hazardous Materials Instructions for Rail", "Effective [revision date] January 1, 2019", available to the East Palestine Fire Department.

### **2.3.2 Post-Accident**

As described in interview transcripts of both the East Palestine Fire Chief, and the East Palestine Deputy Fire Chief, the railroad made a document titled "HM-1, United States, Hazardous Materials Instructions for Rail", "Effective [revision date] April 15, 2023", available to the East Palestine Fire Department.

## **2.4 Preparedness Training Made Available by NS to Jurisdictional Emergency Services Agencies**

### **2.4.1 Pre-Accident**

As described in interview transcripts of both the Fire Chief, and the Deputy Fire Chief, shortly prior to the accident, the railroad had conducted a 'table-top' training exercise with representatives from state and Columbiana County emergency services agencies, including members of the East Palestine Fire Department and the Columbiana County Emergency Management Agency, which involved a simulation scenario of a train derailment with a hazardous materials release. A Columbiana County Emergency Management Agency official, who was on scene the night of the derailment and involved in the initial derailment response, was among the emergency services personnel who attended this training exercise.

### **2.4.2 Post-Accident**

As described in interview transcripts of both the Fire Chief, and the Deputy Fire Chief, the NS offered supplement training to the jurisdictional emergency services agencies after the accident.

## **3.0 Jurisdictional Emergency Services / Emergency Preparedness - Agencies**

### **3.1 Fire / Rescue Agency - EPFD**

The accident occurred on NS property within the response jurisdiction of the EPFD, which also provided fire department response to the incident.

#### **3.1.1 Background / Overview<sup>10</sup>**

The EPFD is the principal emergency services agency responsible for responding to fire suppression, emergency rescue, and an initial response to hazardous materials incidents within the Village of East Palestine, OH, that encompassed the accident site, and was the initial fire / rescue agency that responded to the scene in this incident, as further supported by mutual aid resources of neighboring communities. The Fire Chief is the senior Command Officer in charge of the operational management of the agency. See interview transcripts of the Fire Chief and the Deputy Fire Chief for further information.

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<sup>10</sup> Ref: and for further information, see [Internet] <https://eastpalestine-oh.gov/fire-department>.

### **3.1.2 Training Activities - Emergency Response to Railroad Incidents**

The EPFD had participated in training activities relevant to addressing a response to a railroad incident. See interview transcripts of the Fire Chief and the Deputy Fire Chief for further information.

### **3.2 Law Enforcement Agency - EPPD<sup>11</sup>**

The East Palestine Police Department (EPPD) is the jurisdictional law enforcement agency responsible for responding to law enforcement related events within the Village of East Palestine, OH, that encompassed the accident site, and was the initial law enforcement agency that responded to the scene in this incident, as further supported by mutual aid resources (of neighboring communities). The Police Chief is the senior Command Officer in charge of the operational management of the agency. A detective with the EPPD was the initial officer of the EPPD that responded to the accident scene, in which that officer then assumed command authority over the law enforcement resources (i.e., EPPD officers, and support staff) that responded to the accident scene. See interview transcript of the detective for further information.

### **3.3 PSAP / Emergency Services - Dispatch Agency<sup>12</sup>**

The East Palestine Police Department - Communications Division operates the public safety answering point (PSAP<sup>13</sup> / "911 center") for the Village of East Palestine, and operates the emergency services dispatching facility, which is responsible for receiving and dispatching radio calls for police, fire and EMS services for the Village of East Palestine, as well as several additional jurisdictions (e.g., civil municipalities). The EPPD - PSAP / 911 center was the communication agency that received the initial 911-call notification of the incident and provided dispatching services for police, fire and EMS in the response to the incident.

### **3.4 Emergency Management Agency - Columbiana County EMA<sup>14</sup>**

#### **3.4.1 Operational Background**

The Columbiana County Emergency Management Agency (CCEMA) is the jurisdictional emergency management agency for Columbiana County, OH, which includes the Village of East Palestine that comprises the accident site. The CCEMA "is tasked as the county focal point for planning, coordination, and administration of

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<sup>11</sup> Ref: and for further information, see [Internet] see <https://eastpalestine-oh.gov/police-department/>.

<sup>12</sup> Ref: and for further information, see [Internet] see <https://eastpalestine-oh.gov/police-department/dispatch>.

<sup>13</sup> Such a facility or operation is also referred to as a Public Safety Answering Point (PSAP), as further described in [Internet] <http://www.nena.org/>.

<sup>14</sup> Ref: and for further information, see [Internet] <https://www.ccoema.org>, and as further described.

the countywide "All Hazards" emergency management and disaster preparedness program."<sup>15</sup> The CCEMA was the emergency management agency that responded to the accident scene and provided resources and logistics support to Incident Command during the East Palestine emergency response.

The Director of the agency is the senior principal responsible for the operational management of the agency, who also responded to the accident scene. The agency Director has the roles of the 911 (PSAP) agency Coordinator, as well as the Director of the LEPC<sup>16</sup>.

### **3.4.2 Documented Preparedness Plans<sup>17</sup>**

The CCEMA compiled a preparedness plan, titled "Columbiana County Emergency Management Agency - Emergency Operations Plan", revision date September 2019. The Emergency Operations Plan is distributed to the emergency services agencies in the county for their preparedness planning use. A copy of emergency operations plan is available in the NTSB docket.

Review of the emergency operations plan indicated it addressed highway vehicle, marine-vessel/navigable river<sup>18</sup>, and nuclear power plant<sup>19</sup> incident scenarios, but did not address railroad incident scenarios.

No revisions have been made to the CCEMA - Emergency Operations Plan.<sup>20</sup>

The CCEMA also compiled a preparedness plan, titled "Columbiana County Emergency Management Agency - Hazard Mitigation Plan", "released [revision date] 2019". The hazard mitigation plan is distributed to the emergency services agencies in the county for their preparedness planning use. A copy of hazard mitigation plan is available in the NTSB docket.

## **4.0 Execution of the Emergency Response**

### **4.1 Event Chronology ("Timeline") - Content / Purpose**

An event chronology ("Timeline") is constructed in an NTSB investigation to identify the sequencing facts of the emergency response to the event and to examine the

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<sup>15</sup> Quoted from the agency website [Internet / homepage]: <https://www.ccoema.org>.

<sup>16</sup> i.e., the Local Emergency Planning Committee, as further described in [Internet] <http://www.epa.gov/epcra/local-emergency-planning-committees>.

<sup>17</sup> Ref, interview transcript of the Director of the CCEMA.

<sup>18</sup> Columbiana County borders Beaver County, PA, to the east, in which the Beaver Valley Power Station is located (ref, [Internet] <https://www.nrc.gov/info-finder/reactors/bv1.html>).

<sup>19</sup> Columbiana County borders the Ohio River; a major marine-vessel corridor.

<sup>20</sup> i.e., review of the document as available in the agency's website.

execution of the emergency response effort (e.g., fire suppression / search and rescue). The principal responding emergency services agencies (i.e., the local fire department, law enforcement, EMS) are afforded the opportunity to provide incident response data and communications information as relevant to this accident.

#### **4.2 Timeline of the Initial Emergency Response**

A timeline describing the initial execution of the emergency response to the accident, as engaged by the jurisdictional fire department, and responding emergency services support agencies, was compiled in the investigation, as shown in Exhibit 1.

#### **4.3 Mutual Aid Response Support in the Incident**

Mutual aid response support to this accident was forthcoming from neighboring emergency services jurisdictions in Columbiana County, as well as emergency services jurisdictions in Beaver County, PA, along with other OH counties contiguous with Columbiana County, as well as from agencies in WV.<sup>21</sup>

During pre-Hearing interviews with principals of the responded emergency services agencies, it was indicated that the agencies are still in the process of compiling their report documentation of their response to the accident. Accordingly, the investigation was unable to compile a roster of the mutual aid support agencies that provided the mutual aid response. Further data on the mutual aid response may be forthcoming in a Supplemental Factual Report, based on data as received from the responding emergency services agencies.

#### **4.4 Evacuation During Initial Execution of the Emergency Response**

See event chronology Timeline, Exhibit 1.

### **5.0 Injury Sustained During Initial Execution of the Emergency Response**

#### **5.1 Civilians**

There were no injuries reported to or identified by the investigation.

#### **5.2 Emergency Response Personnel**

There were no injuries reported to or identified by the investigation.

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<sup>21</sup> The provisions of the mutual aid response agreement between contiguous jurisdictions (in this area), provides for an 'automatic' (pre-arranged) request to respond to an incident of this magnitude.

### **5.3 Railroad Personnel**

There were no injuries reported to or identified by the investigation.

### **6.0 Hazard Communications**

The Technical Panel additionally examined the following topic-points.

#### **6.1 Placarding**

##### **6.1.1 Background**

As stipulated in regulation, railroads that transport hazardous material must comply with placarding requirements.<sup>22</sup> Generally, each railcar containing hazardous material [lading] must be placarded on each side and each end of the railcar, with a specific type of placard. A placard is signage that contains information on the lading of the railcar to which a placard has been affixed.

Relative to strength and durability of the placard, the regulation states:

§ 172.519 General specifications for placards.

(a) Strength and durability. Placards must conform to the following:

(1) A placard may be made of any plastic, metal or other material capable of withstanding, without deterioration or a substantial reduction in effectiveness, a 30-day exposure to open weather conditions.

(2) A placard made of tagboard must be at least equal to that designated commercially as white tagboard. Tagboard must have a weight of at least 80 kg (176 pounds) per ream of 610 by 910 mm (24 by 36-inch) sheets, waterproofing materials included. In addition, each placard made of tagboard must be able to pass a 414 kPa (60 p.s.i.) Mullen test.

(3) Reflective or retroreflective materials may be used on a placard if the prescribed colors, strength and durability are maintained.

##### **6.1.2 Relevancy to the Investigation**

Responding firefighter interview testimony indicated that placards affixed to a number of the railcars had been subjected to heat from fires and sustained damage.

The investigation documented the damaged placards - in photographs of several railcars at the accident site. The photographs are provided in Exhibit 2.

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<sup>22</sup> Ref: and for further information, see [Internet] 49 C.F.R. § 172.500 - § 172.560, inclusive.

As depicted in the photo-images, some of the placards were damaged to the extent that they were no longer functional (i.e., the information was not visible, or missing).

## **6.2 AskRail® App**

### **6.2.1 Background**

The AskRail® 'app' is application software, which was developed by the seven North American Class 1 railroads, the Association of American Railroads (AAR), and AAR subsidiaries Railinc Corp. and the Transportation Technology Center, Inc. Generally described, the app is loaded into a personal communication device (typically a cellular telephone that is capable of using application software), which allows the [pre-qualified] viewer the ability to receive technical information about a given train consist, including individual railcar information.

As described by the International Association of Fire Chiefs:<sup>23</sup>

The free AskRail® mobile app is a safety tool that provides first responders immediate access to accurate, timely data about what type of hazardous materials a railcar is carrying so they can make an informed decision about how to respond to a rail emergency.

AskRail® is a backup resource if information from the train conductor or train consist is not available. AskRail® was designed to give first responders immediate information about railcars carrying hazardous materials and be an invaluable tool for helping prepare those on the front line should a rail incident occur. Couple this with emergency training and response planning, AskRail® augments the flow of information and specifics between freight railroads and the emergency first responders in communities along the nation's 140,000-mile freight rail network.

For security reasons, only qualified emergency responders who have been vetted by their local railroad can download the app.

According to a description on the app's website:<sup>24</sup>

*The AskRail® app is a safety tool for first responders. The AskRail app, launched in 2014, is a collaborative effort among the emergency response community and all North American Class I railroads. The app provides nearly 50,000 first responders – from 49 states, the District of Columbia and eight Canadian provinces – with immediate access to accurate, timely data about what type of hazardous materials a railcar is carrying so they can make an informed decision about how to respond to a rail emergency. Thousands more first responders are covered by their local*

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<sup>23</sup> Ref: [Internet] [https://www.iafc.org/topics-and-tools/resources/resource/askrail-\(tm\)-app](https://www.iafc.org/topics-and-tools/resources/resource/askrail-(tm)-app).

<sup>24</sup> Ref: and for further information, see [Internet] <https://askrail.us/>.



*Emergency Communication Center's use of AskRail data. Railroads work with first responders to continually update the app with new features and enhancements.*

An example of an information image produced by the Askrail app as displayed on the video screen of a cellular telephone is provided in Exhibit 3.

### **6.2.2 Relevancy to the Investigation**

The East Palestine Fire Chief was interviewed by NTSB (during the on-scene phase of the investigation), at which time he said that he was not familiar with the AskRail app and did not have access to it.<sup>25</sup> He indicated that in the future, he would like to have access to it and be able to share it with this team.

In a subsequent interview of the East Palestine Deputy Fire Chief, the Fire Chief (who was participating as an interviewer) indicated that he had since been provided access to the AskRail app, although his team still needed education about it.<sup>26</sup> The Deputy Chief indicated that he had heard of the AskRail app before the accident, but had not been provided access to it.

## **E. EXHIBITS**

### **Exhibit 1. Timeline of the Initial Emergency Response**

Select abbreviations and acronym nomenclature used in this Exhibit

~	approximate, or approximately
BC	Beaver County, PA [generic]
BCEMA	Beaver County, PA, EMA
CAD	Computer Aided Dispatch [report]
CCEMA	Columbiana County Emergency Management Agency
EP	Village of East Palestine (municipality)
EPFD	East Palestine Fire Department
EPHS	East Palestine High School
EPPD	East Palestine Police Department
EMA	Emergency Management Agency (jurisdictional county)
EMS	Emergency Medical Services (ambulance)
FD	fire department [generic]
hazmat	hazardous materials [generic]
IC	Incident Commander
ICP	Incident Command Post

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<sup>25</sup> Ref: Interview transcript - East Palestine Fire Chief, dated February 16, 2023.

<sup>26</sup> Ref: Interview transcript - East Palestine Deputy Chief, dated February 28, 2023.

ICS 201 ICS 201 [form] is a document utilized by Incident Command (and the Command and General Staffs), to describe basic information regarding an incident situation and resources allocated to the incident, as documented in the ICS 201 form, which also serves as an initial action worksheet, and as a permanent record of the response activities (i.e., in a professional firefighting context / situation / circumstance, utilization of the ICS 201 form usually connotes that a 'formal' / 'functional' Incident Command process has been established)<sup>27</sup>.

IPAWS Integrated Public Alert & Warning System; communications messaging, sent by jurisdictional emergency service(s) agency(ies), to various entities<sup>28</sup>

NS Norfolk Southern Railway

PD police department [generic]

PSAP Public Safety Answering Point<sup>29</sup>

ref reference, or in referenced to

WENS Wireless Emergency Notification System; communication [text] messaging, sent by jurisdictional emergency service(s) agency(ies), to personal mobile [cell] telephones<sup>30</sup>

Note --

- all timestamps cited are in prevailing local times.
- timestamp cited is in 4-digit, or 6-digit, military clock-time; e.g., 00:00:00 is midnight, 12:00:00 is noon, 20:00 or 20:00:00 is 8:00 pm.

Date	Time	Activity	Data Source
2/3/23	20:54:22	Derailment occurs	Operations Group Factual report (from locomotive event recorder download)
2/3/23	20:56:49	911 call placed to EP police (PSAP) - initial notification regarding a train derailment, explosion and fire,	EPPD CAD

<sup>27</sup> see further [Internet] [https://training.fema.gov/emiweb/is/icsresource/assets/ics%20forms/ics%20form%20201,%20incident%20briefing%20\(v3\).pdf](https://training.fema.gov/emiweb/is/icsresource/assets/ics%20forms/ics%20form%20201,%20incident%20briefing%20(v3).pdf)

<sup>28</sup> see further [Internet] <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/>.

<sup>29</sup> Such a facility or operation is also referred to as a Public Safety Answering Point (PSAP), as further described in [Internet] <https://www.nena.org/default.aspx>.

<sup>30</sup> i.e., as described by Inspiron Logistics LLC; see further [Internet] <https://www.inspironlogistics.com>.

		followed by multiple subsequent 911 calls	
2/3/23	20:58:00	Dispatch radio to EP FD - 1st alarm to Station 24; request all available fire and EMS report to the station and respond to Pleasant and East Taggart Street for train derailment and fire	PSAP / dispatch audio recording
2/3/23	21:00:00	EP vol FD arrival on scene; the Deputy Chief / EPFD - [was] identified as the 'initial' Incident Commander (IC)	EPPD CAD, Deputy Chief / EPFD transcript
2/3/23	~ 21:00	Phone call placed by the Deputy Chief / EPFD, to the Chief / EPFD [who was on scheduled Leave at that time]	Deputy Chief / EPFD transcript
2/3/23	21:01:00	2nd alarm to station 24 all available fire and EMS report to the station and respond to E. Taggart and Alice St	PSAP / dispatch audio recording
2/3/23	21:02:00	Dispatch was advised to contact NS to obtain any additional information	PSAP / dispatch audio recording
2/3/23	21:04:00	EP dispatch contacted NS in Atlanta GA to obtain info. NS took info and [said they] would call back	PSAP / dispatch audio recording
2/3/23	21:07:36	IC called dispatch from scene to request hazmat team and engine and tanker from Springfield	PSAP / dispatch audio recording
2/3/23	21:08:00	Dispatch request placed to Station 11 and Station 24 (?), requesting all available personnel to respond	PSAP / dispatch audio recording
2/3/23	21:10:00	Director / Columbiana County Emergency Management Agency (CCEMA) - received a cell phone call as the initial notification of the incident	Director / CCEMA transcript
2/3/23	21:15:00	Director / CCEMA - called Emergency Manager / Beaver County, PA, EMA (BCEMA),	Emergency Manager / BCEMA transcript

		requesting hazmat mutual aid response	
2/3/23	21:24:00	Fire Chief / East Liverpool FD - received first notification of activation	Fire Chief / East Liverpool FD transcript
2/3/23	21:30:00	Call placed by CCEMA / Director, to NS Hazmat Regional Manager - inquiry 'should they evacuate' ?	NS Hazmat Regional Manager transcript
2/3/23	21:35:39	Beaver County (BC) - Emergency Services was notified, and assistance requested; full response initiated from Beaver County stations 11, 18, and 22	BC CAD
2/3/23	~ 21:45	EPPD began evacuating residential dwellings on Taggart St. and Clark St that were too close to the fire	EPPD Detective transcript
2/3/23	~ 21:47	Director / CCEMA arrived on scene	Director / CCEMA transcript
2/3/23	21:53:00	WENS (public notification system) message sent to residents, advising those within 1 mile of the accident site to shelter in place	EPPD CAD
2/3/23	21:54:00	Fire Chief / East Liverpool FD arrived on scene	Fire Chief / East Liverpool FD transcript
2/3/23	~ 21:56	NS / Northern Region Hazmat Manager - sent Train Consist, via email, to Columbiana County EMA	NS Northern Region Hazmat Manager transcript
2/3/23	~ 21:59	Director / CCEMA - received Train Consist via email from NS / Northern Region Hazmat Manager	Director / CCEMA transcript
2/3/23	~ 22:00	NS communicates to Deputy Chief / EPPD; responding fire Command [i.e., Deputy Chief / EPPD] is now cognizant of hazmat (vinyl chloride and benzene) lading on the train / involvement in the product release(s)	Deputy Chief / EPPD transcript

2/3/23	22:15:00	Beaver County Hazmat [response team] arrival at the Incident Command Post (ICP), located at the [brand name omitted] gasoline filling station, on Taggart Rd	Emergency Manager / BCEMA transcript
2/3/23	22:23:00	Fire Chief / East Liverpool FD - received emailed train Consist, from Director / CCEMA	Fire Chief / East Liverpool FD transcript
2/3/23	22:34:12	OH State Patrol advise 1 mile evacuation	EPPD CAD
2/3/23	22:59:00	Determination to issue 1 mile evacuation to residents - WENS message sent, along with Federal IPAWS	Director / CCEMA transcript
2/3/23	~ 23:00	NS hazmat personnel arrive on-scene; contractor arrival shortly thereafter.	NS / Northern Region Hazmat Manager transcript
2/3/23	~ 23:00	Weather report received by Fire Chief / East Liverpool FD, from CCEMA	Fire Chief / East Liverpool FD transcript
2/4/23	~ 00:00	Suspension of fire suppression operations, due to research of railcar [tank] contents (identifying the hazmat lading, and prescribed response procedure guidance), with subsequent Incident Command post relocation to EP FD [location]	Fire Chief / EPFD transcript
2/4/23	00:22:48	Columbiana County announced 1 mile (radius) evacuation, and shelter at EPHS	Director / CCEMA transcript
2/3/23	01:30:00	EPPD Detective received email copy of the consist	EPPD Detective transcript
2/4/23	~ 02:00	Fire Chief / EPFD arrival on scene; Fire Chief / EPFD - identified as the 'subsequent' (replacement) IC	Fire Chief / EPFD transcript
2/4/23	~ 02:15	Fire Chief / EPFD found printed train Consist at command post	Fire Chief / EPFD transcript

2/4/23	04:00:00	Beaver County Hazmat [response team] released from scene	Emergency Manager / BCEMA transcript
2/4/23	04:20:00	Fire Chief / East Liverpool FD - departed the scene	Fire Chief / East Liverpool FD transcript
		Fire suppression, engaged at this juncture, consisted of unmanned master-stream water application, at various sites, as protection of exposed structures, situated around the perimeter of the fire scene	Fire Chief / EPFD transcript
2/4/23	11:13:00	ICS 201 created by NS	IAP documentation

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**Exhibit 2. Photographs of Placards Affixed to Railcars at the Accident Site**



The above photo was taken by an NTSB investigator at the accident site. It shows a railcar with a placard indicating that benzene (a flammable liquid) is contained therein.



The above photo was taken by an NTSB investigator at the accident site. At the center of the photo is a placard holder. A charred red material is wrapped around the crossbars of the placard. No placard text is visible.





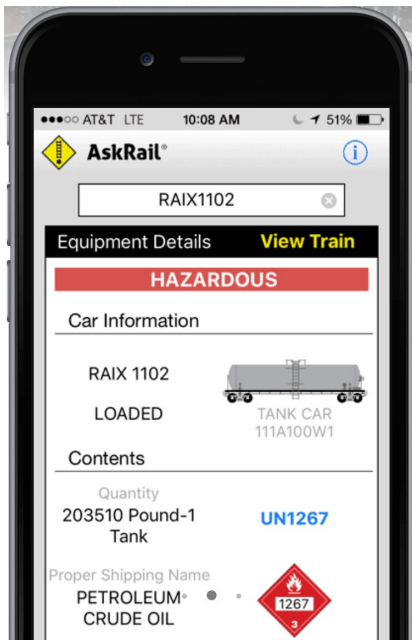
The above photo was taken by an NTSB investigator at the accident site. It was cropped to only show the placard, which is warped.



The above photo was taken by an NTSB investigator at the accident site, depicting a placard that was totally destroyed, apparently by heat exposure.

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### Exhibit 3. Example of Askrail App Information Image, as Displayed on a Cellular Telephone





The illustration depicts an example 'data presentation' from the Askrail app, as displayed on a cell phone.

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-- End of Report --