

Mishap Investigation and Corrections Process Review

SAFETY & HEALTH
LEARNING ALLIANCE



Dial **844-467-6272** and enter
the passcode **990429#**

Event Logistics

- Facilitator introduction
 - Mike Lipka, Knowledge Management Officer
NASA Safety Center
- To ask a question
 - We will field questions after each speaker
 - Type your question in the chat box at the bottom right
- The presentation will last approximately an hour and a half
- To get a closer look at the slides, select “Full Screen”
- Turn off the speakers on your computer



Agenda

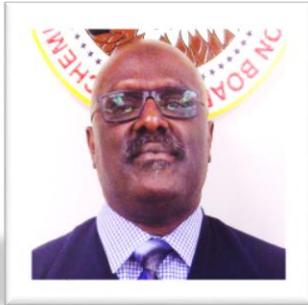
- Goals of the Safety and Health Learning Alliance
- Today's Panel Speakers
- Discussion and key points
- Wrap-up and next event

Goals of the SHLA: The Four C's

- **COLLABORATE** Create a forum for collaboration
 - Repeatable process with trusted advisors
- **CONCENTRATE** Accelerate learning
 - “Quick hits” on timely, topical, and new approaches
- **CONTEXT** Learn from your peers—what they do and how they do it
 - Knowledge + Experience = Wisdom
- **CONNECT** Establish networking opportunities
 - Extend beyond events for personal and professional development

Learn more at <https://nsc.nasa.gov/SHLA>

Today's Panel Speakers



Mr. Johnnie Banks

Chemical Incident Investigator at United States
Chemical Safety and Hazard Investigation Board



Mr. Hugh O'Connor

Special Agent
Bureau of Alcohol, Tobacco, Firearms and Explosives



Mr. John Vorderbrueggen

Division Chief, Pipeline and Hazardous Materials
Investigations at U.S. National Transportation
Safety Board

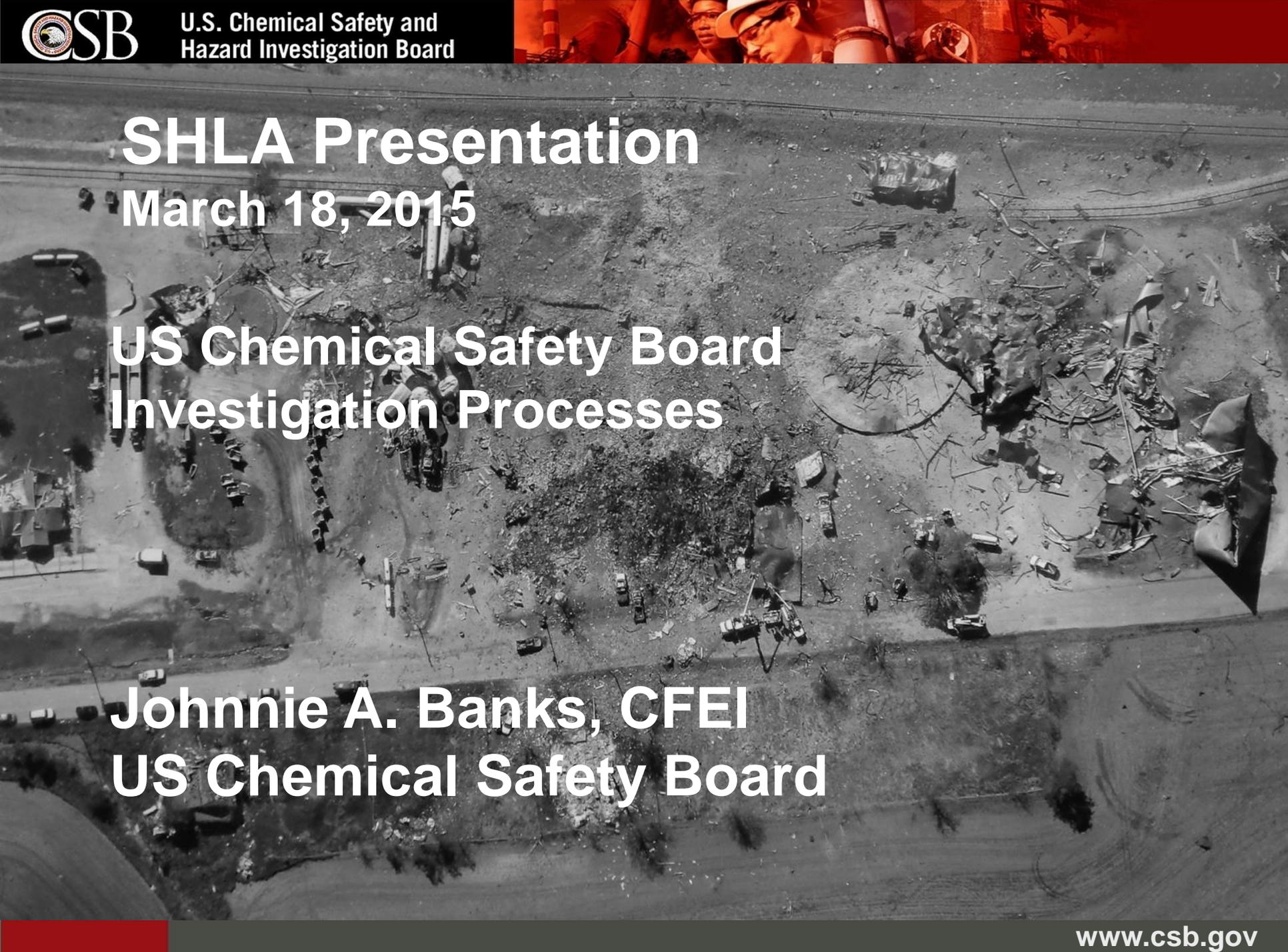


SHLA Presentation

March 18, 2015

US Chemical Safety Board Investigation Processes

Johnnie A. Banks, CFEI
US Chemical Safety Board





Disclaimer

The presentation regarding the United States Chemical Safety and Hazard Investigation Board CSB investigation process, by Johnnie Banks on March 18, 2015, to the NASA 2015 Safety Directors and Occupational Health Managers Meeting is given for general informational purposes only.

The presentation represents the individual views of the presenter. Furthermore, the statements today and this presentation may not represent a formal adopted view of the Board.

Users of this presentation should also note that the contents were compiled solely for this presentation. For specific information on CSB investigations, please refer to the CSB website at www.csb.gov



Agenda

- **CSB at a glance**
- **Investigation Process**
- **Causal Factors in Incident Investigation**
- **Corrective Actions & Recommendations**
- **Training & Development**
- **Areas on the Horizon**



Chemical Safety Board (CSB)

- Independent federal agency
- Investigates major chemical accidents
- Finds *root causes* of accidents
- Conducts safety studies
- Issues recommendations to stakeholders





Chemical Safety Board (CSB)

- Regulatory Agencies (OSHA, EPA)
- Non-Governmental Organizations (NFPA, API, ASME)
- Companies & Industrial Sectors
- **Legislative** Bodies (States, Local)
- Disseminates findings-Reports and Videos



Investigation Process

- **Product recipients**
- **Number of investigations per year**
- **Investigation authority**
- **Arranging and Conducting Interviews**
- **Testimony protections**
- **Publishing reports/video products**





Causal Factors

- **Method(s) used**
- **Fact based process**
- **Driving down to root cause**
- **Stopping points**
- **Recommendation development**





April 17, 2013: The West Fertilizer Plant Explosion

INCIDENT SUMMARY:

Ammonium Nitrate Explosion

- **14 Dead (mostly emergency responders)**
- **Over 250 injuries**
- **Over 150 damaged homes**



January 8, 2014: Freedom Industries



INCIDENT SUMMARY:

Storage Tanks leaks 10,000 gals MCHM

- **300,000 consumers without water**
- **Unknown long-term health risks**



QUESTIONS ?



U.S. Chemical Safety and Hazard Investigation Board



U.S. Chemical Safety Board

2175 K St., NW Suite 400

Washington, DC 20037

202-261-7600

www.csb.gov



SHLA Mishap Investigation and Corrective Action Plan

Mission: To investigate large fire and explosion incidents anywhere in the U.S.

History:

1978 - Program formulated, 2/10 man teams

1980 - 4/10 man teams, 4 team leaders

1984 - 4/20 man teams

1996 - 4/26 man teams (104), Team Leader became fulltime job

2001/2002 – 5 Special Agents selected as Full Time

**2009 – 1 Team, 3 Regions, 3 Team Leaders, 13 Full Time SA's,
104 Part time NRT members**

**Present - SA's 16 Full Time, 113 Part time
Fire Protection and Electrical Engineers
Chemists**



Stats:

- Annual callouts:
 - Highs of 42 (1999)
 - Low of 11 (2011 and 2013)
 - Historical average of 23

ATF was the first Federal agency with this specialized response capability and the only to use the Team Concept

Team Concept:

- **Integration of ATF and local agency personnel**
- **Division of investigative responsibilities**
- **Integration of the scene and lead (follow-up) aspects of the investigation**
- **ONE investigation**

Response Examples:

1993: New York Trade Center

1995: Oklahoma City Bombing

1996: Atlanta Olympic Park Bombing

1996: TWA Flight 800 Crash

2001: 9/11 Pentagon Crash Scene

2006: Alabama Church Arson Spree

2007: Charleston, SC Super Sofa Fire

2010: North East Texas Church Arson Fires

2013: West Fertilizer Plant Explosion

FREE OF CHARGE

Callout Criteria

REALITY:

Fire or explosion incident where either the size or complexity (Hazards) of the scene or the amount of investigative leads/follow-up to be completed are beyond the combined local ATF Field Office and other Agencies resources



SCENE/INVESTIGATION ASSESSMENT

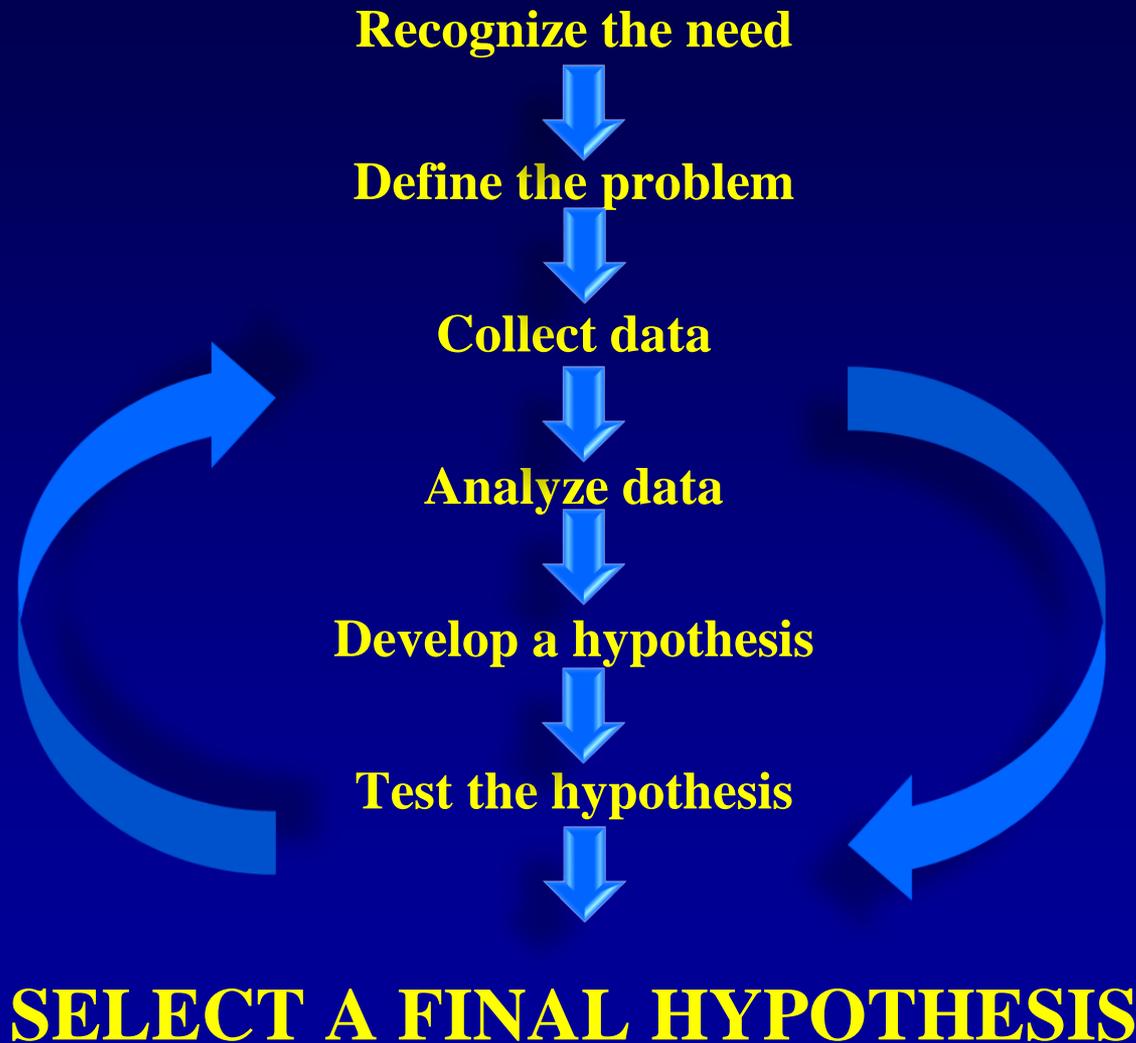
Before requesting an NRT activation, the field division SAC will immediately send a supervisor, NRT member, CFI, or CES to the site of the incident to make a detailed assessment.



Factors the Assessor should Consider *

- A. Target or victim(s).**
- B. Estimated property damage value.**
- C. Number of resulting deaths/injuries.**
- D. Size and complexity of the scene, especially regarding safety issues.**
- E. Potential number of investigative leads related to the incident.**
- F. Probability of primary ATF jurisdiction. (Note other agencies involved, if possible.)**
- G. Availability and expertise of resources/equipment to be utilized for excavating the scene.**
- H. Sensitivity of the incident.**
- I. Extent/impact of the incident on the local and regional area and community, i.e., lost employment because of devastating destruction of major business employer.**
- J. Receptiveness of local authorities to ATF assistance.**
- K. Extent/impact of local, regional, or national media interest.**

Scientific Method as defined in NFPA 921



**Team makeup – For an incident callout:
Standard team has 22 members
Adjust as needed**

Team Special Agent in Charge

Team Supervisor

Special Agents:

- All are seasoned agents with fire and explosion investigation experience
- Most are Certified Fire Investigators and/or Certified Explosives Specialists
- All agent are cross trained to fill different functions as needed



Team makeup continued:



Chemist
Fire Protection Engineer
Electrical Engineer
Canine (Arson or Explosive)

**Explosive Enforcement
Officer, other Support
Personnel as needed.**
**All members are hazmat
trained to Technician level.**
**Team can bring level A/B
equipment if needed**



LEAD COORDINATOR



Tracks all leads, interviews & reports
Report on significant developments

Lead Certified Fire Investigator/CES

-Authors final report and provide testimony



Joint decision making—
Specialists from all agencies
in agreement prior to making
origin and cause
determination and preparing
the report





FORENSIC MAPPING



The application to police investigations parallels, in some aspects, that of the surveyor, determining distances (x,y,z) and angles.

On-Scene Support by ATF FRL Engineers

Testing the Hypothesis of the Origin and Cause

NRT Callout in Joliet, IL



ATF FRL - Fire Modeling

NRT Callout in Houston, TX



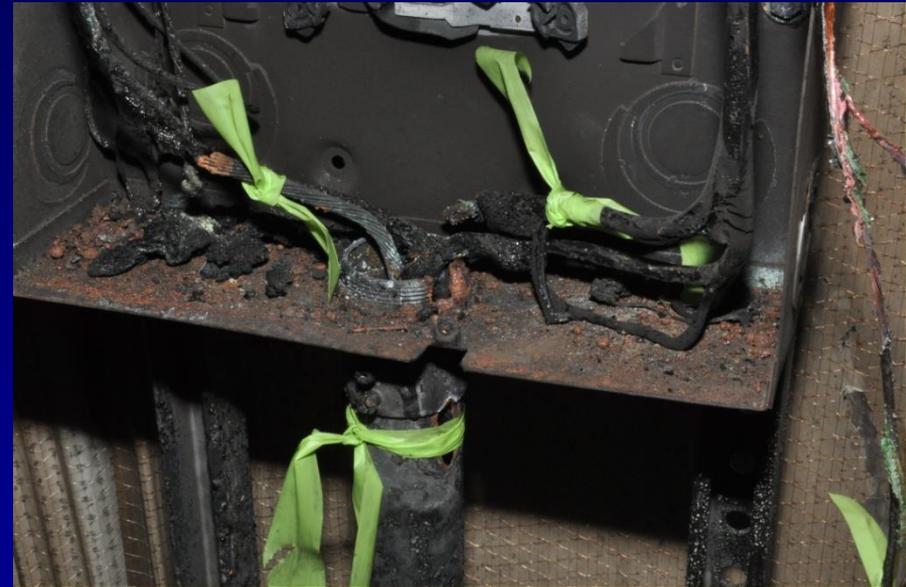
ATF FRL - Fire Test on site



ATF FRL Electrical Engineer

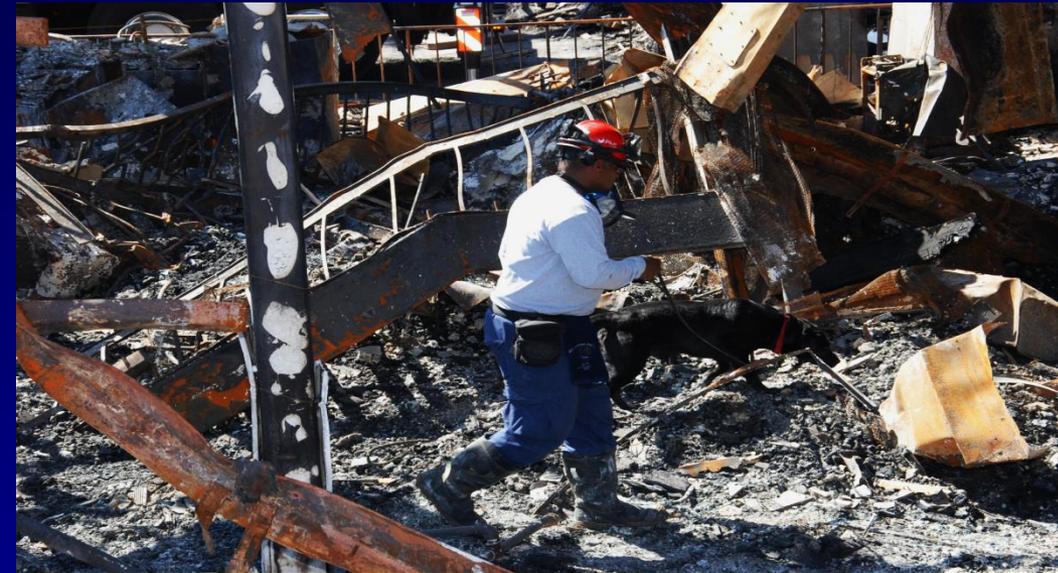


**ATF FRL Electrical Engineer :
Conducting Electrical
Examination**



**ATF FRL Electrical Engineer:
Arc Mapping**

1989 - ATF K-9 program initiated



K-9's and Handlers
are members of
State/Local law
enforcement agencies





40 Trucks Nationwide

- 33 1996-2003 generation
- 7 2004s



5 Mobile Command Units Strategically Placed Throughout the US



DAILY and FINAL BRIEFINGS



**Ensure information is shared between scene
and lead/interview teams
All must agree on findings
Reports, photos, sketches & logs turned over**



Initial Briefing

All participants are expected to be @ Initial Brief

Daily briefings in evening

*All participants

Average 4-6 days on scene, 1 day reports, final briefing

*The NRT works through weekends and holidays. All participants are expected to participate

What to Expect from NRT



Results with the NRT:

If incendiary (arson): the goal is to either solve while the NRT is on site or at minimum leave with a viable suspect developed.





NATIONAL RESPONSE TEAM



INTERNATIONAL RESPONSE TEAM



**National
Transportation
Safety Board**

National Transportation Safety Board Accident Investigations

**NASA 2015 Safety Directors and
Occupational Health Managers Webinar**

John B. Vorderbrueggen, PE

**Chief, Pipeline and Hazardous Materials
Investigations**

Origin of the NTSB

- Air Commerce Act of 1926
U.S. Department of Commerce shall investigate aircraft accidents
- 1940 - Investigations assigned to the Civil Aeronautics Board
Bureau of Aviation Safety

Origin of the NTSB

- 1967 - NTSB embedded in the US Department of Transportation
- 1975 - NTSB reestablished as an independent, Executive Branch agency
- US Code Title 49, Chapter 11
– 49 CFR 800

NTSB Transportation Modes

- Aviation
 - Marine
 - Highway
 - Railroad
 - Pipeline
- Hazardous Materials
- 

NTSB Features

- Independent Federal Agency
- Does not regulate transportation equipment, personnel, or operations
- No official role in establishing and enforcing industry regulations
- Does not initiate enforcement action

NTSB Investigations

- Establish the facts, circumstances, and cause or probable cause of transportation accidents
- Evaluates adequacy of safeguards and procedures concerning transportation of hazardous materials
- **Issues Recommendations**

The NTSB Board Members

March 2015

Christopher A. Hart - Chairman

Robert L. Sumwalt

Earl F. Weener

Dr. Bella Dinh-Zarr

Paulsboro, NJ Vinyl Chloride Release



Direction
of Travel

Mantua Creek

Paulsboro, NJ
November 30, 2012

→ N

Paulsboro, NJ Vinyl Chloride Release



Paulsboro, NJ Vinyl Chloride Release



Paulsboro, NJ Vinyl Chloride Release



NTSB Investigations – On Scene

- NTSB is the lead agency
- Party participation
 - Owner, regulators, unions, responders
 - Privilege, not a right
 - Party coordinator
 - Lawyers excluded
- Signed Party Certification required

Investigation Party System

- Investigation Groups established
 - NTSB Group Chairmen
 - Fact-finding phase only
 - May not withhold Information
 - Prohibits crossover to internal investigations

Investigation Party System

- Conduct interviews
- Collect evidence
 - Records
 - Photographs
 - Hardware
 - Interviews
 - Audio and video recordings

Investigation Party System

- Group Factual Report
 - All Party members concur
- Group analysis report
 - NTSB staff only
- Board approved Report and Recommendations

Casselton, ND
December 30, 2013





National Transportation Safety Board

John B. Vorderbrueggen, PE

Chief, Pipeline and Hazardous
Materials Investigations

202-314-6467

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Wrap Up and Next Event

- Visit the SHLA Web site at nsc.nasa.gov/SHLA
 - Video of this presentation, slides, event summary
- SHLA Event Survey: We'd like to hear your feedback
- Our next event
 - Pressure Vessel Systems
 - June 16, 2015 at 1 p.m. EDT
 - Join the panel by contacting Mike Lipka at michael.j.lipka@nasa.gov or 440.962.3172