National Transportation Safety Board

Federal Transit Administration State Safety Oversight Agency Workshop April 24, 2017

Georgetta Gregory

Chief, Railroad Division

National Transportation Safety Board
50 Years of Saving Lives

Fifty years ago, on April 1, 1967, the National Transportation Safety Board (NTSB) came into existence, helping to fulfill President Lyndon B. Johnson's pledge to ensure the safety of Americans on land, sea, and air.

National Transportation Safety Board
50 Years of Saving Lives

In 1966, Johnson recommended the creation of a single Department of Transportation (DOT), bringing together the functions of many far-flung agencies. He also urged

> …that there be created under the Secretary of Transportation a National Transportation Safety Board independent of the operating units of the Department. The sole function of this Board will be the safety of our travelers. It will review investigations of accidents to seek their causes. It will determine compliance with safety standards. It will examine the adequacy of the safety standards themselves… I consider the functions of this Board so important that I am requesting authority from Congress to name five Presidential appointees as its members.

National Transportation Safety Board
50 Years of Saving Lives

"...

No function of the new agency—no responsibility of its Secretary—will be more important than safety."

Follow us on Twitter #NTSB50 and Facebook for NTSB Anniversary updates.
See the NTSB Safety Compass Blog: NTSB: 50 Years of Asking "Why?"

NTSB – 50 Years of Saving Lives – Rail Highlights

- 1970 first positive train control safety recommendation
- Independent Safety Board Act of 1974
- 1974 nationwide Operation Lifesaver highway-railroad grade crossing program safety recommendation
- 1990 the first NTSB Most Wanted List
- 1994 Amtrak passenger safety information
- 2008 Rail Safety Improvement Safety Act of 2008 – Positive Train Control mandate following Chattsworth, California Metrolink accident
- 2008 Rail Passenger Disaster Family Assistance Act
- 2012 tank car improvements following derailment in Cherry Valley, Illinois on June 19, 2009
- 2013 Lac Magantic tragedy following derailment of unit crude oil train on July 6th
- 2015 call for stronger tank car specifications follow Mount Carbon derailment on
- 2017 use of NTSB UAS as accident investigation tool in Grattinger, Iowa derailment involving hazardous materials

NTSB Mission – *Independently Advancing Transportation Safety*

To promote transportation safety by

- maintaining our congressionally mandated independence and objectivity;
- conducting objective, precise accident investigations and safety studies;
- performing fair and objective airman and mariner certification appeals; and
- to assist victims of transportation disasters and their families.

NTSB Strategy

Vision

Identify and promote lessons learned from accident investigations to help make transportation safer

Values

The NTSB embraces the values of transparency, accountability, and integrity in our work. We are committed to these values every day and in every way.

Strategic Goals

- Accomplish objective investigations of transportation accidents.
- From investigations, recommend and advocate actions that will improve transportation safety.
- Outstanding stewardship of resources.
- Organizational excellence.

NTSB Board

- Five Board Members
  - One Chairman and one Vice-Chairman
- Nominated by President and confirmed by the Senate
- 3 Members constitute quorum
- No more than 3 Members of the same political party
- Board Members are not investigators

NTSB Congressional Mandate

- Investigate every civilian aviation accident in the United States and significant accidents in the other modes of transportation – highway, marine, pipeline, and railroad – and to issue safety recommendations intended to prevent future accidents

NTSB Authority

- Title 49 of the United States Code, Chapter 11
- Governed by Title 49 *Code of Federal Regulations*, Chapter VIII
  - Title 49 *Code of Federal Regulations*, Parts 800-850

Determine the Probable Cause of:

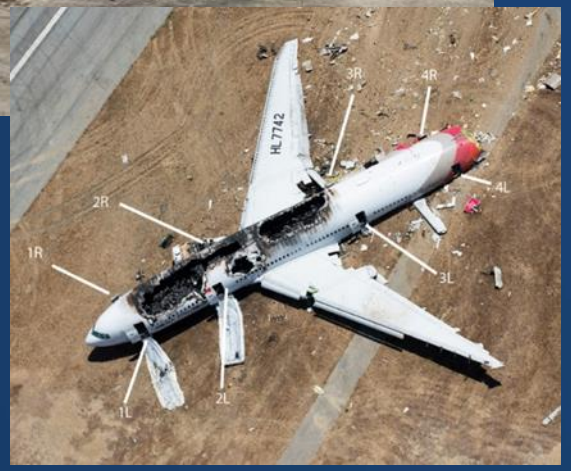
- All U.S. civil aviation accidents and certain public-use aircraft accidents;
- Selected highway accidents;
- Railroad accidents involving passenger trains or any train accident that results in at least one fatality or major property damage;
- Major marine accidents and marine accidents involving a public and a non-public vessel;
- Pipeline accidents involving a fatality or substantial property damage;
- Releases of hazardous materials in all forms of transportation; and
- Selected transportation accidents that involve problems of a recurring nature.

Statutory Requirement to Investigate
Railroad/Rail Transit Accident

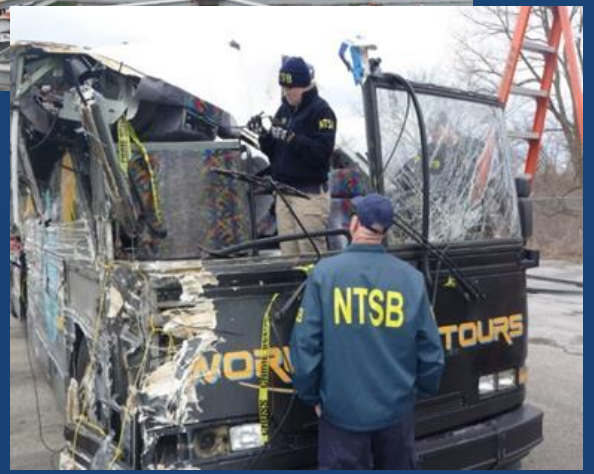
- Fatality
- Substantial Property Damage
- Passenger train
- Other accidents involving issues of a recurring nature

NTSB Investigative Offices

Aviation Safety

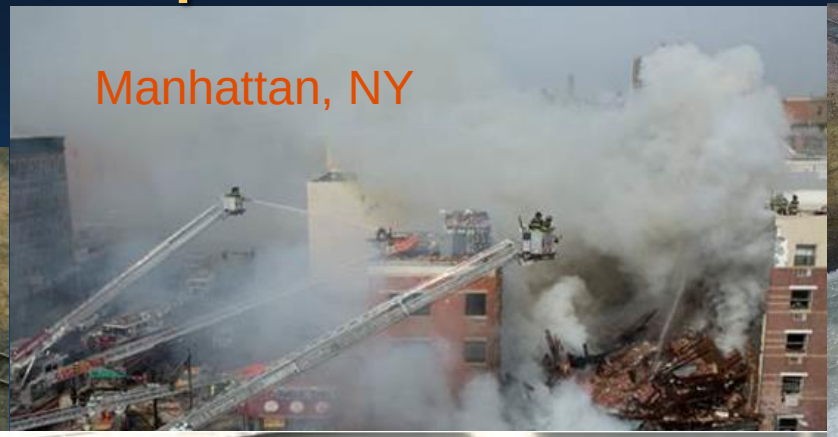


Highway Safety



Marine Safety

Office of Railroad, Pipeline and Hazardous Materials Investigations



Railroad Division

- 13 railroad investigators
- Strategically located:
  - Washington, DC
  - Chicago, IL
  - Los Angeles, CA
  - El Paso, TX
  - Virginia
  - New Jersey

NTSB Priority in Investigation

- NTSB railroad investigations have priority over other federal investigations
- Federal agencies, such as the FTA, FRA, EPA, or USCG, may conduct concurrent investigations
- Exception – Criminal investigations are led by the FBO

NTSB Investigation Teams

Typical on-scene team consists of an investigator-in-charge (IIC) and groups in the following disciplines:

- Operations
- Mechanical
- Track
- Signals and Train Control
- Human Performance
- Survival Factors

NTSB Investigation Teams

Specialized groups, as necessary, may include:

- Medical
- Metallurgy
- Recorders
  - Event recorders
  - Video recorders
  - Audio recorders
- Fire/Explosion
- Environmental response

Highway-Railroad Grade Crossing Accidents

- Office of Highway Safety usually leads the NTSB accident investigation
- Railroad investigators may support the investigation or take the lead

NTSB Party System

- Parties are limited to person, government agencies, companies, and associations whose employees, functions, activities, or products were involved in the accident and who can provide suitable qualified technical personnel to actively assist in the investigation

Parties to an NTSB Investigation

Parties may include representatives from:

- Railroad
- Rail Transit Agency
- FTA
- FRA
- Labor organizations
- Emergency responders
- Equipment manufacturers

What is the Party System

- Party spokesperson
- Party representatives
- Work under the direction of a group chairman
- Remains intact for the duration of the investigation
- All parties do not participate in all groups

NTSB Party Participation Limits

Who cannot be a party to the investigation?

- Public affairs
- News media
- Attorneys
- Claims agents

NTSB Rules of Party Confidentiality

- Parties are prohibited from speaking about the investigative findings with the media or the public
- No independent investigations by parties (with the exception of concurrent/parallel investigations by the FTA or FRA
- No information is withheld from the NTSB

On-Scene Process

- Organization Meeting
- Daily progress meetings
- Close-out meeting
- Sharing of information
  - Evidence
  - Interview transcripts
  - NTSB Factual Reports

Party Participation After On-Scene Work

- Follow-up interviews
- Participation in materials laboratory examination as necessary
- Participation in video group and other groups as necessary
- Technical review
  - Party representatives review NTSB factual report, edit as needed, and concur with report
  - Party Spokepersons participate in the technical review of all group factual reports, edit as needed, and concur with report

NTSB Board Members On-Scene

- Provide the media with factual information
- Update victims and families about the facts and progress of the investigation
- Brief government officials about the progress of the investigation

NTSB Investigation Support

- NTSB internal support
  - Media relations
  - Government affairs
  - Transportation disaster assistance
  - General council
- External support
  - FBI
  - Local law enforcement
  - Federal air marshals

NTSB Office of Research and Engineering

- Materials Lab
- Recorders Lab
- Simulations and animations
- Safety studies and statistics
- Medical doctors

NTSB Investigative Hearing

- Public forum to gather additional facts about an accident
- Board Members serve as the Board of Inquiry
- NTSB technical staff serve as the technical panel
- Party spokesperson participation
- Witnesses -- people and organizations that can provide special or technical knowledge

NTSB Accident Report

- Draft report is prepared by the NTSB investigative staff
- Report general prepared within 12 to 24 months after the accident
- Some reports are presented to the Board at a public meeting (Sunshine Meeting)
- Board Members vote to adopt the report, the findings, and the probable cause, as presented or with modifications

Additional NTSB Reports

- Special Investigation Report
  - Focus on specific safety issue
  - May involve multiple accidents
  - Determine facts, conditions, and circumstances about the issues
- Safety Study
  - Evaluate the effectiveness of government and industry transportation safety programs
  - Examine policy issues, system safety, and management effectiveness

SMS Components – Where is Hazard Management?

1. Written policies, procedures and guidelines
2. Data Collection and analysis
3. Risk Management
4. Safety Culture

Safety Management Systems and Hazard Management

Probable Cause

- Failure of the track circuit modules
- WMATA's failure to ensure that an enhanced track circuit verification test was institutionalized and used system-wide after a 2005 precursor event (near-collisions)

Data leads to informed Risk Management

- “Hazards and incidents resulting from department operations shall be identified at all levels.

- “Conditions and acts posing unacceptable risk shall be eliminated or changed to prevent personal injury or illness and property damage or loss.”

--NBAA Prototypical Safety Manual

Why Risk Management?

- “A thorough work risk assessment of dispatching operations may have identified several deficiencies that, if corrected, would have ensured safety-critical tasks were addressed appropriately.”

From NTSB report of CN derailment

NTSB Recommendation to FRA

- “Require that safety management systems and the associated key principles (including top-down ownership and policies, analysis of operational incidents and accidents, hazard identification and risk management, prevention and mitigation programs, and continuous evaluation and improvement programs) be incorporated into railroads’ risk reduction programs …”

  - (NTSB Recommendation R-12-3)

Risk Management

"We manage risk whenever we modify the way we do something to make our chances of success as great as possible, while making our chances of failure, injury or loss as small as possible."

-- FAA System Safety Handbook

What is a hazard?

- Any existing or potential condition that can lead to injury, illness, or death; damage to or loss of a system, equipment, or property.

- A condition that might cause (is a prerequisite to) an accident or incident.

- Source: FAA AC 120-92A

What is risk?

- A composite depiction of probability that a hazard will manifest itself in a mishap, and the severity of the mishap, should the mishap occur.

- Risk = Probability x Severity

Assess Risk

PROBABILITY

	Unlikely	Seldom	Occasional	Likely
Catastrophic	2	3	4	4
Critical	1	2	3	4
Marginal	1	1	2	3
Negligible	1	1	2	2

How do we deal with risk?

- Accept the risk
- Transfer the risk
- Share the risk
- Eliminate it
- Mitigate it

Measure effectiveness of controls

- Continually reassess to ensure that what you are doing is actually working

- Seek continuous improvement

How Much to Reduce Risk?

- ALARP = As Low As Reasonably Practicable
- Different than as low as possible

What is the best order for these?

Incorporate Guards/Safety Devices
(Guards put up to decrease exposure)

Eliminate the hazard through Design
(Hazard is corrected and eliminated)

Develop Procedures and Training

Provide Warning Devices
(Warn personnel if you can't eliminate or control the hazard

Hierarchy of Controls*

1. Eliminate the hazard through Design
2. Incorporate Guards/Safety Devices

    Guards put up to decrease exposure

3. Provide Warning Devices

    3. Warn Personnel if you can't eliminate or control the hazard

4. Develop Procedures and Training

*Also known as "Safety Order of Precedence"

Controls to mitigate risks associated with grade crossings

1. Eliminate the hazard through **Design**

2. Incorporate **Guards/ Safety Devices**

3. Provide **Warning Devices**

4. Develop **Procedures** and **Training**

Manage Risk Decisions at the Right Level

Safety culture

"Safety culture is the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment."

Source: U.S. Nuclear Regulatory Commission

Finally…

- The lifeblood of SMS is data – having data about what is going on in your organization.
- The heart of SMS is a process of continuous improvement.
- The soul of SMS is having a safety culture.

Georgetta Gregory
Office: 202-314-6628
Cell: 202-841-6624
georgetta.gregory@ntsb.gov