NTSB National Transportation Safety Board

Eliminate Flammable Fuel / Air Vapors in Transport Category Aircraft

NTSB MOST WANTED
Transportation Safety Improvements

Fuel Tank Explosions

TWA 747, July 1996

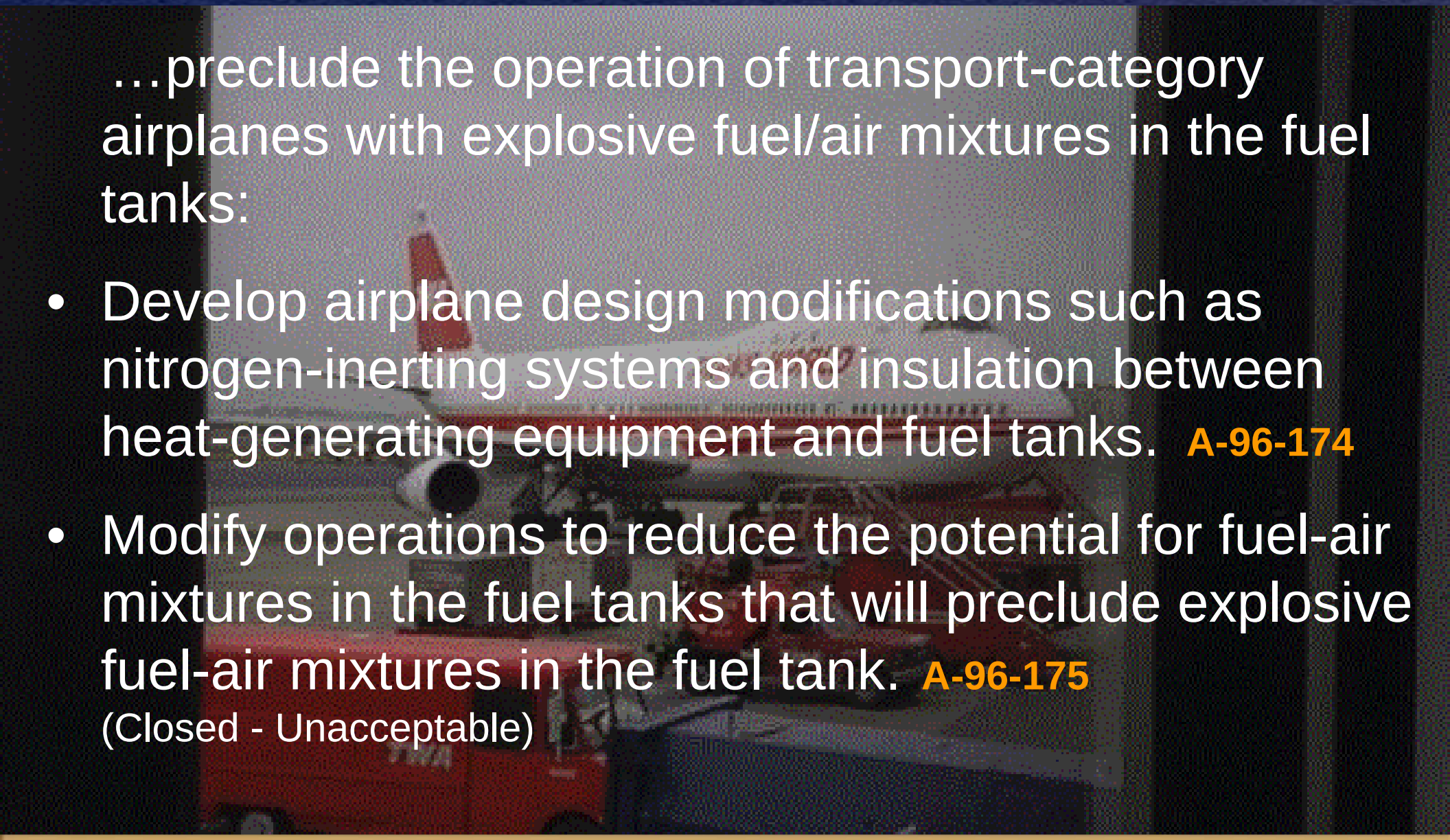

PAL 737, May 1990


Avianca 727, November 1989

346 fatalities since 1989

NTSB MOST WANTED
Transportation Safety Improvements

Safety Improvements Wanted



…preclude the operation of transport-category airplanes with explosive fuel/air mixtures in the fuel tanks:

- Develop airplane design modifications such as nitrogen-inerting systems and insulation between heat-generating equipment and fuel tanks. **A-96-174**
- Modify operations to reduce the potential for fuel-air mixtures in the fuel tanks that will preclude explosive fuel-air mixtures in the fuel tank. **A-96-175**
  (Closed - Unacceptable)

NTSB MOST WANTED
Transportation Safety Improvements

Fuel Tank Explosions a Threat?

Video of a secondary explosion in a 737 at Okinawa, September 2007

FAA Actions

Special Federal Aviation Regulation 88 (SFAR88) : Total design review of all transport airplane fuel systems for potential ignition sources.

Development of a nitrogen-based flammability reduction system.

NTSB MOST WANTED
Transportation Safety Improvements

Addressing only ignition sources has *proven* to be inadequate.

Fuel tank safety has only been brought to current ignition prevention standards.

SFAR88 process found additional ignition risks.

After more than 120 airworthiness directives issued, 16 ***additional*** threats were found to require AD action

NTSB MOST WANTED
Transportation Safety Improvements

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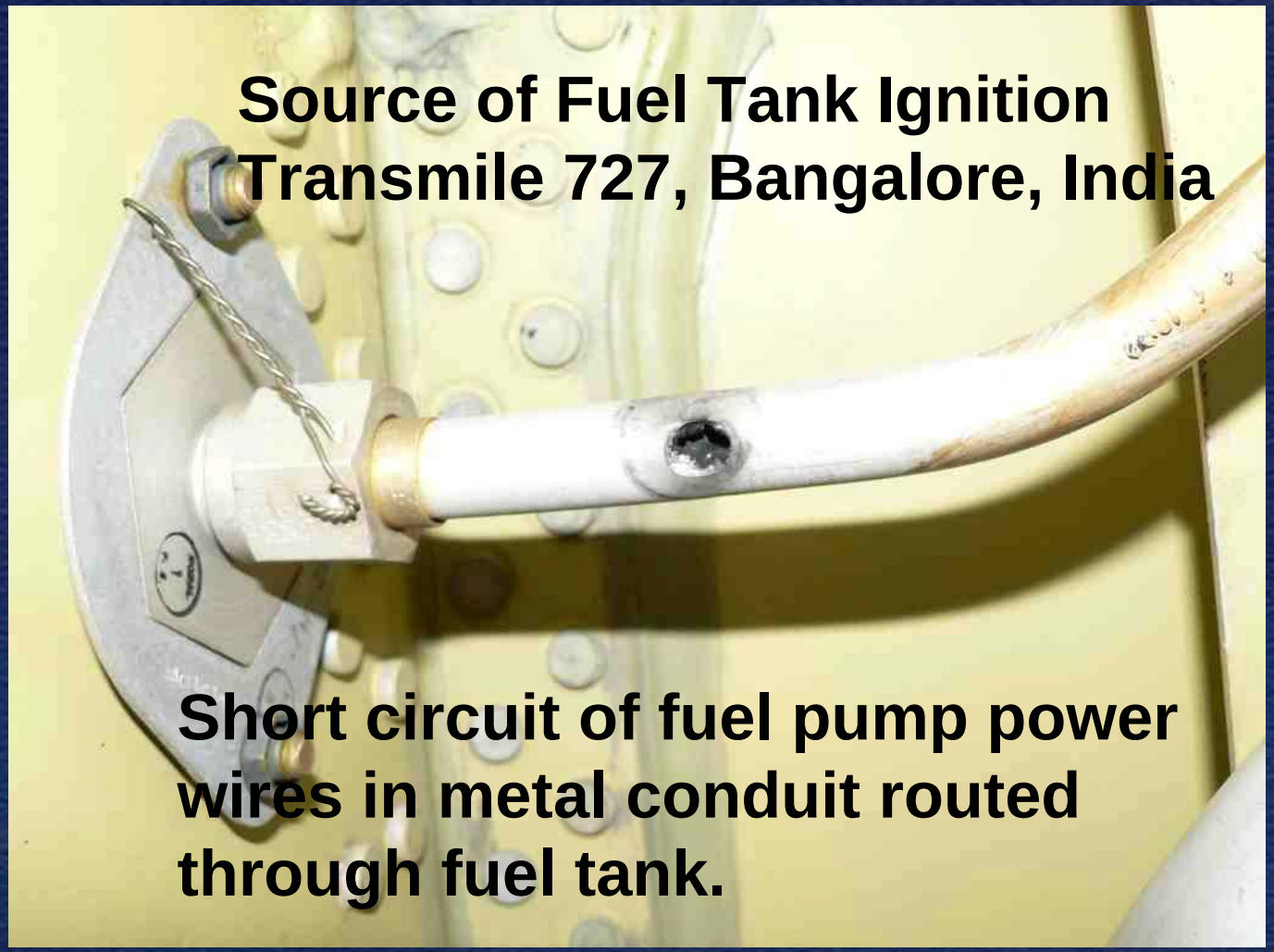


NTSB MOST WANTED
Transportation Safety Improvements

FAA Developed Fuel Tank Rulemaking

FAA obtained industry and public input

NTSB did not agree to exclude wing fuel tanks

The proposed new rule would would require:

Flammability reduction in

- Existing fleet
- Newly manufactured airplanes
- New designs

3,277 airliners total

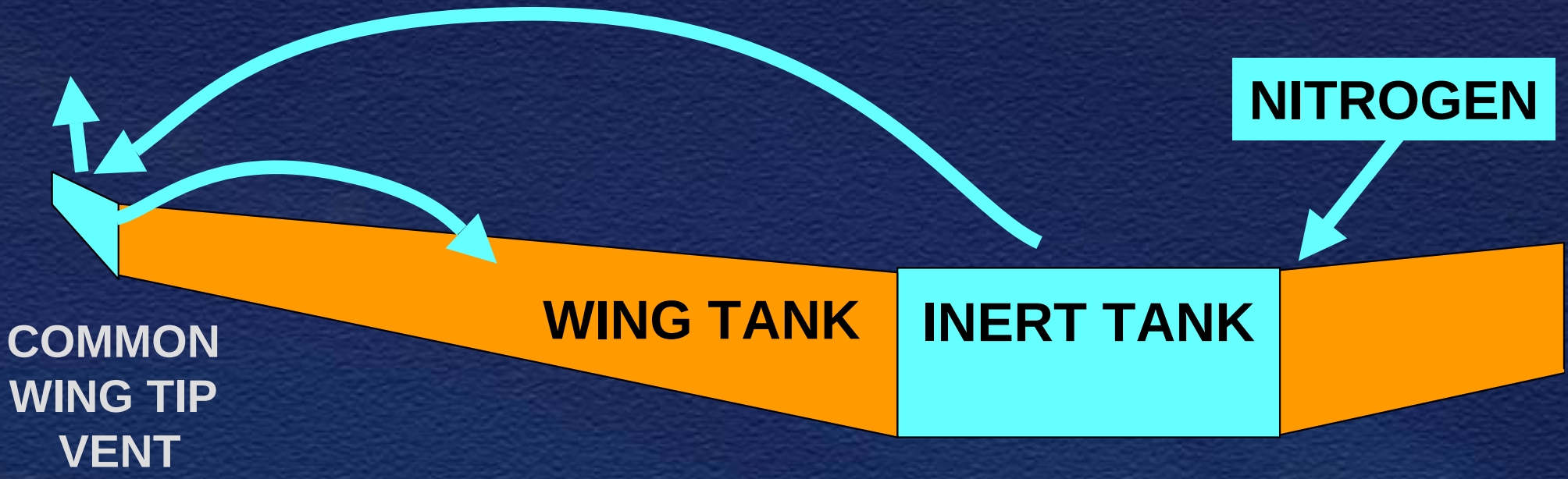
Establishment of new design standards

New operating rules for retrofitting existing airplanes

NTSB MOST WANTED
Transportation Safety Improvements

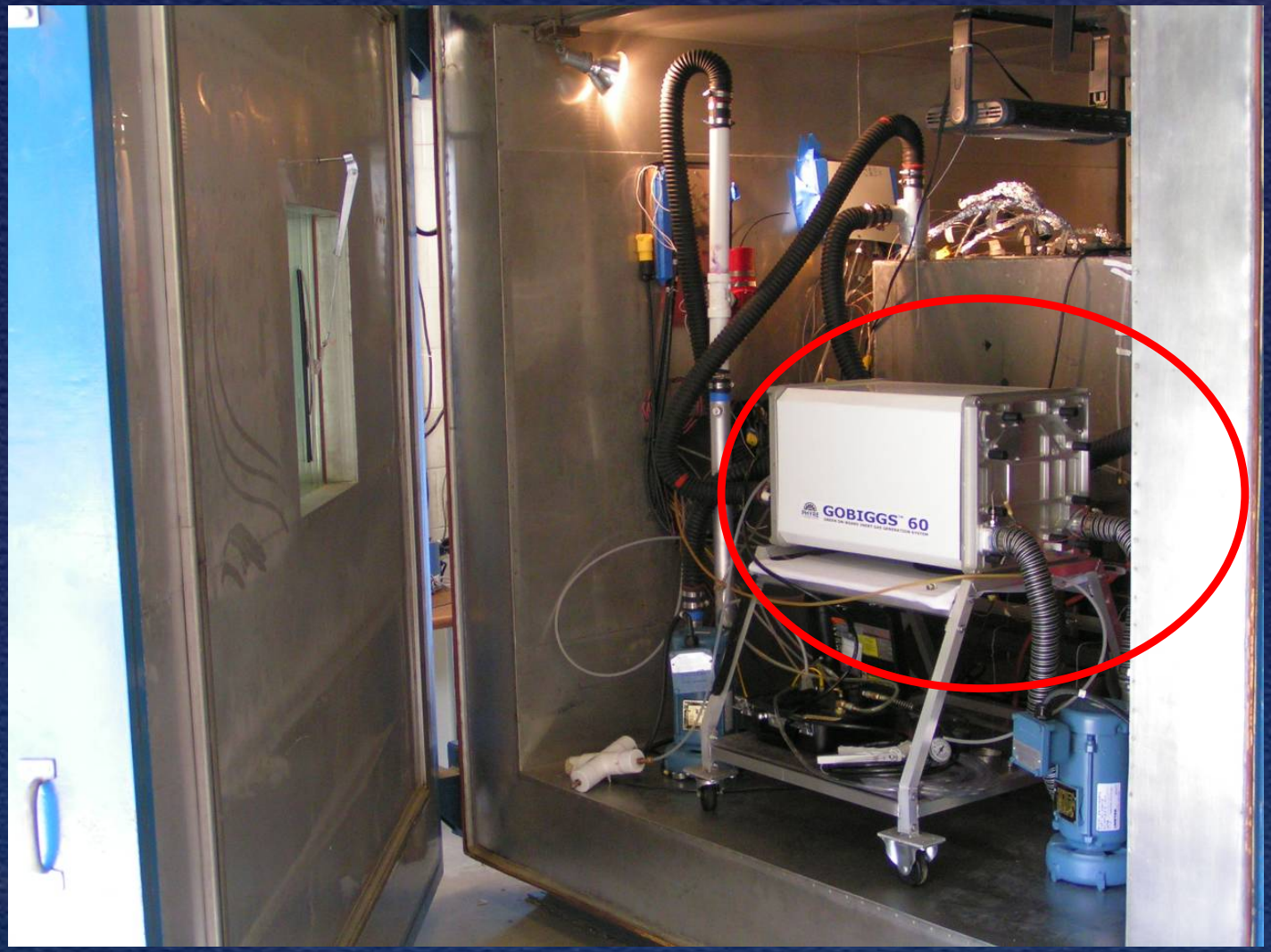
Inerting CWT Helps Wing Tank Flammability

Nitrogen shared at shared wingtip vent box
Nitrogen is heavier than air
Extent of cross-venting varies



NTSB MOST WANTED
Transportation Safety Improvements

New Technology



NTSB MOST WANTED
Transportation Safety Improvements

Flammability Reduction Systems Work

- Four airplanes flying since end of 2005
- Over 30,000 flight hrs at 11 to 13 hrs/day/plane
- No technical problems or failures

  Manufacturer and operator: “Non-Issue” technically
- Fuel cost essentially too small to be measured
- Test program is resulting in design improvements

Rule Repeatedly Delayed

FAA Rulemaking Project Initiated 2/17/04
NPRM Published on 11/23/05

DOT Office of Secretary
Returned to FAA twice: 8/13-27 and 9/10-25
Scheduled to deliver to OMB June 20, 2007

Publication scheduled for September 2007
Now scheduled for February 2008

Cost-Benefit Analysis is the Big Issue

"We continue to work on the details of the rulemaking action to determine how it can be imposed consistent with our mandate to demonstrate that the additional benefits of this requirement are sufficient to justify its costs."

FAA letter of October 23, 2007

NPRM Benefits Understated

Fact: Over 346 deaths since 1989, 541 since 1959
Fact: Over 25 fuel tank explosions.

Using OMB methodology, the FAA excluded:

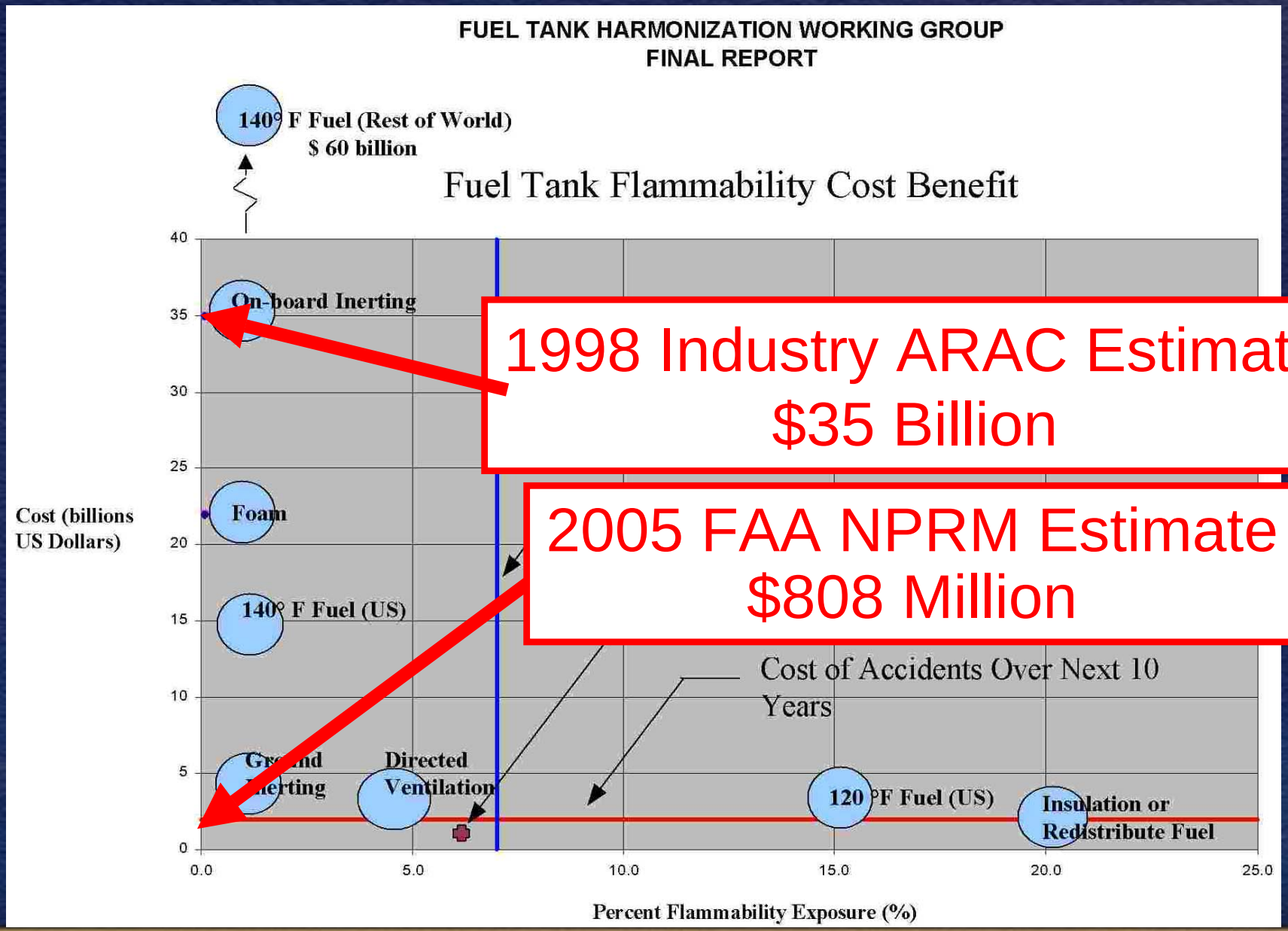
- Wing tanks – some benefit reaches wing tanks
- Indirect benefits – Fire protection in unoccupied areas
- Deliberate acts

Benefit apparently based on small number of cases

Leaves analysis vulnerable to criticism of individual events

NTSB MOST WANTED
Transportation Safety Improvements

Costs Were Overstated



1998 Industry ARAC Estimate
$35 Billion

2005 FAA NPRM Estimate
$808 Million

NTSB **MOST WANTED**

Transportation Safety Improvements

Fuel Tank Explosions Since TWA 800

Thai Airways, March 2001

Transall C160R, May 2004

Transmile, May 2006

NTSB MOST WANTED
Transportation Safety Improvements

Eliminate Flammable Fuel/Air Vapors in Fuel Tanks

Proposed Safety Board Actions

- Keep the issue area on Most Wanted List
- Retain yellow designation:

  Acceptable response – progressing slowly

Timeliness Classification	YELLOW