



# Kiloton Killer

*The Collision of the SS Mont-Blanc and the  
Halifax Explosion*

## Senior Management ViTS Meeting

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# BACKGROUND

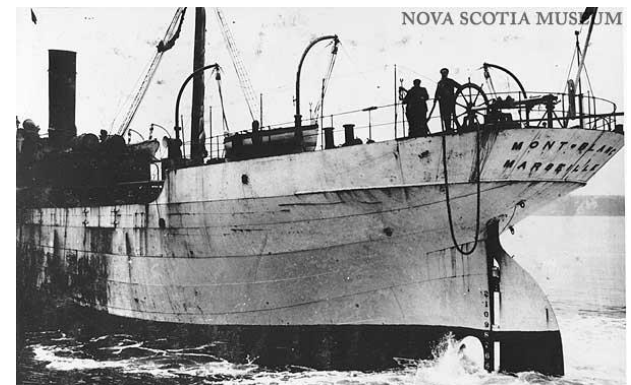
**December 6, 1917, Halifax, Nova Scotia, Canada:** the Great War reached across the Atlantic to transform one of North America's natural deepwater ports into a teeming logistics hub. In a new tactic, the Allies formed shipping convoys against lurking German U-boats to deliver tons of supplies. Joining a convoy, French freighter SS *Mont-Blanc* entered Halifax Harbour. Known only to the crew and a few port officials, the ship was packed with munitions. Steaming outbound, the SS *Imo* collided with the *Mont-Blanc*. Sparks set the French ship on fire and the ship erupted into the largest explosion yet created by man. Blast pressure leveled every structure within a mile and blew wreckage for tens of miles. Approximately 2,000 people were killed and over 9,000 injured. The unprecedented recovery effort that followed was the genesis of modern disaster relief programs.

## Halifax Harbour

- Played pivotal role during WWI as a hub for Allied shipping.
- Is naturally defended by the “Narrows,” a constricted channel that leads into the harbor basin.
- Ships keep to the right of each other, like road traffic.

## Involved Vessels

- *SS Imo*—a neutral charter for the Belgian Relief
  - Long and unwieldy in restricted waters—a single propeller drive torqued the *Imo* left or right when accelerating forward or backwards.
- *SS Mont-Blanc*—a slow French freighter carrying
  - 2,366.5 tons of both wet and dry picric acid (2,4,6 trinitrophenol—more powerful/volatile by weight than TNT)
  - 250 tons of TNT
  - 246 tons of benzol (benzene)
  - 62.1 tons of guncotton (nitrocellulose)
  - 300 rounds of mixed 90mm and 95mm ammunition



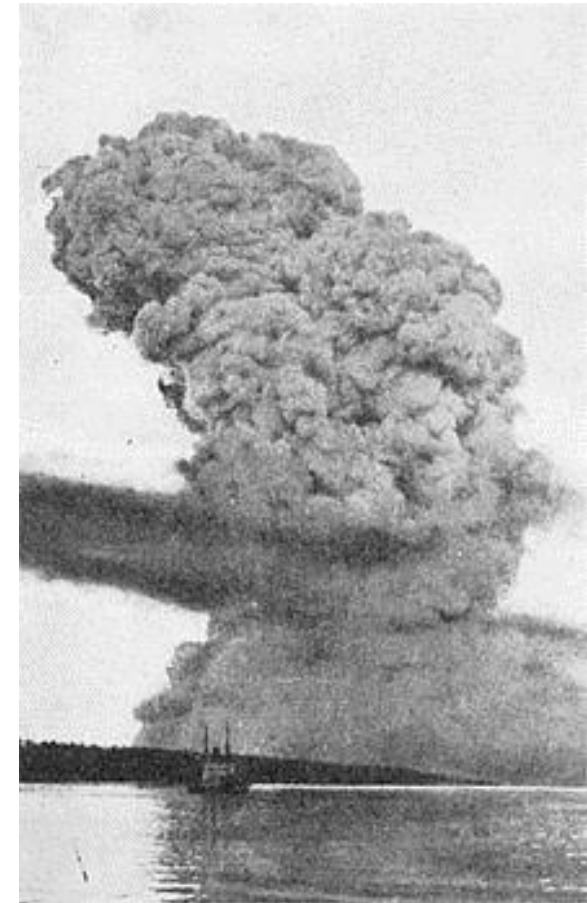
# WHAT HAPPENED

## Navigation and Collision

- The *Mont-Blanc*, choosing not to fly a red flag that would tip off its munitions cargo to German U-boats, came in through the Narrows on the morning of Dec. 6, to join a convoy for protection across the Atlantic.
- The *Imo*, bound for New York, but delayed a day to refuel, was leaving the basin.
- The *Imo*, maneuvering around oncoming traffic, signaled the *Mont-Blanc* that the *Imo* would pass on the wrong side. Then the *Imo* slammed into full reverse.
- Although both ships maneuvered to avoid collision, the unwieldy *Imo* swung into the *Mont-Blanc*, toppling benzol barrels on deck, which broke open and ignited after the two ships' metal hulls showered the *Mont-Blanc's* deck with sparks.

## Explosion

- The commotion drew crowds of citizens to windows and to the shore to watch the spectacle
- The damaged and abandoned *Mont-Blanc* drifted to the Halifax shore and, after fire reached the cargo holds, exploded with a force of 2,989 tons of TNT, obliterating the city of Halifax.
  - 1,600 instantly killed
  - 9,000 wounded (22 percent of total pop. were casualties)
  - 12,000 buildings obliterated or made uninhabitable
- A 1,140 pound anchor fragment from the *Mont-Blanc* was found 2.35 miles away.



# PROXIMATE CAUSE

The *Imo* collided with the *Mont-Blanc*, rupturing containers of benzol on the *Mont-Blanc*. Sparks from the grinding metal hulls ignited the benzol which spread to the *Mont-Blanc*'s explosive cargo.

# UNDERLYING ISSUES

## Procedures Fail

- Traditional conventions, such as flying a red flag to signify explosive cargo, and/or having ships unload cargo on islands far from the port itself, were relaxed during military harbor occupation due to increased shipping.
- Incorrect use of the channel by multiple ships created a culture of rule-breaking, as the *Imo* also utilized the channel lanes incorrectly.
- Outgoing ships, according to the *Mont-Blanc*'s surviving harbor pilot, were to wait for a break in incoming traffic before leaving. Port officials relaxed this rule during high wartime traffic.

## Poor Communication

- The few individuals aware of the *Mont-Blanc*'s cargo, did not ensure separation in time and space for the *Mont-Blanc*.



# AFTERMATH

- Halifax's military population supplied the ruined city with extra manpower to recover and rebuild.
- Cities from across the globe sent trained rescue workers, millions of dollars, and tons of supplies.
- As a result, Halifax's recovery advanced the medical fields of triage, emergency medicine, rehabilitation, psychology, psychiatry, ophthalmology, anesthesia, orthopedics, reconstructive surgery, and prosthetics.
- Samuel Henry Prince, doctoral student at Columbia, examined the Halifax explosion as a basis for his thesis, *Catastrophe and Social Change*—the first systematic study of disaster.

# RELEVANCE TO NASA

- Competitive secrecy and proprietary technology can block communication between teams in government or industry that face safety risks.
- Safety risk increases when essential safety information is masked by another kind of perceived risk. Such information, known to few but not all with need to know, has been called the “unknown known” by Slovenian philosopher Slavoj Zizek.
- Where high energy systems are involved, planners and operators must understand who “needs to know” and ensure understanding—especially during phases of change (lifecycle phases, shift turnovers).
- Wherever NASA activities occur, the first priority must remain to protect the public.