Essential Question: 26 April 2021

What caused the Hindenburg disaster, and what can we learn from it?

Questions/Key Points	Notes

The rapid burning was likely caused because the Zeppelin was filled with hydrogen.	• Key facts
	  ○ Date: May 6, 1937
	  ○ Aircraft: the *Hindenburg*, German Zeppelin
	  ○ Location: Lakehurst Naval Air Station, NJ
	  ○ Souls on board: 97
	  ○ Deaths: 35
	• Sequence of events
	  ○ https://www.britannica.com/topic/Hindenburg
	  ○ German Zeppelin, built by Nazi Germany
	  ○ Designed to be filled with helium, but was instead filled with Hydrogen b/c of trade restrictions b/w US and Germany at the time
	  ○ Made 10 successful round trips in 1936 b/w Germany and US, over the Atlantic
	  ○ Attempted landing at Lakehurst, NJ when the disaster happened
	  ○ https://www.archives.gov/exhibits/eyewitness/html.php?section=5
	  ○ The Hindenburg is seen dumping water ballast as the pitch becomes more and more nose-high. It then drops its landing lines and prepares for docking when it catches fire and burns rapidly.
	  ○ Upon falling to the ground, the duralumin frame/skeleton is seen collapsing
	• Probable Cause
	  ○ https://www.acs.org/content/dam/acsorg/education/resources/highschool/chemmatters/articlesbytopic/biographyandhistory/chemmatters-dec2007-hindenburg.pdf
	  ○ https://www.airships.net/hindenburg/disaster/
	  ○ The Hindenburg design:
	  ■ Duralumin frame; 16 gas bladders that held the hydrogen - very flammable
	  ■ Covered in a canvas-like material on the outside
	  ○ Probable cause isn't totally agreed upon
	  ○ Official theory: there was a recent thunderstorm when the Hindenburg attempted to land. Static buildup and discharge ignited the hydrogen which in turn caused the airship to burn up.
	  ■ Flaw with this theory: the Hindenburg had also been previously struck by lightning, but didn't burn up
	  ○ Incendiary paint theory: Flammable material was used to seal the canvas covering on the outside of the airship. Hydrogen doesn't burn yellow like the Hindenburg did.
	  ■ The tail remains level even while it was initially burning; suggests that the bladders were still intact at that time
	  ■ The paint mixture contains aluminum and iron oxide, same reagents in the thermite reaction
	  ■ Upon a burn test, the fabric did burn in the same way that the Hindenburg itself did
	  ■ Flaws: lightning strikes happened before and burned through the fabric but didn't ignite
	  • Static discharge also isn't enough to light thermite mixture,

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Is it possible that the Hindenburg was sabotaged?	which takes a lot of heat. ● The Hindenburg looks like it's burning from the inside out in the video ○ Some sabotage/political/military theories but none with substantial evidence to justify them ○ Ultimately, fire likely caused by spark and leaking hydrogen which ignited first, then the fabric caught fire and caused the yellow flames. ● Takeaways ○ Airships were basically done after this ○ Hydrogen is a bad idea Footage: https://www.youtube.com/watch?v=fURATK5Yt30

Summary

The Hindenburg was a hydrogen-filled Zeppelin airship that ignited due to a spark from electrical discharge. The accident killed 35 people and ended mainstream airship travel.