

Evaluate the six engineers in Section 1.8.1 of Siegel (2019).

Select any two engineers and identify what they created, what they improved upon, and how their creation has been advanced upon in the current era.

What overall impact did their creations have on the world at that time and in the present day?

How did their creations differ from those that came before them?

Who is responsible for these advancements and were there other design attempts?

Textbook:

<https://platform.virdocs.com/r/s/0/doc/712839/sp/74525071/mi/315256845?cfi=%2F4%2F2%2F20%2F8%2F4%5Bhead-3-10%5D%2C%2F1%3A0%2C%2F1%3A0>

Hello,

Simon Ramo and Dean Wooldridge

Ramo and Wooldridge designed more accurate intercontinental missiles that are credited with securing peace between the U.S. and USSR. Beginning in the 1950s, the U.S. created missiles carrying warheads to act as deterrents in an effort to avoid nuclear war. However these missiles had poor accuracy and thus to compensate were loaded with giant warheads which required even larger missiles that were ultimately fragile and unreliable. Subsequently the U.S. Government approached Ramo and Wooldridge to solve the problem. They concentrated on resolving the core issue of accuracy thereby allowing a redesign: smaller, reliable missiles carrying lighter warheads. Nuclear deterrence continues in the present day in the form of the nuclear triad (intercontinental missiles, bombers, and submarines) and remains the backbone of U.S. national security.

Judith Love Cohen

Cohen designed the Apollo Abort Guidance System (AGS) in the Apollo lunar module. Space Technology Laboratories (later Thompson Ramo Wooldridge Inc.), an American company involved in aerospace, was tasked with creating the AGS, a backup system for the Lunar Module primary guidance system. The initial designs of AGS did not include a computer but a sequencer without any navigation ability. Cohen, an electrical engineer at Space Technology Laboratories, improved upon the design with the Abort Electronic Assembly, the AGS computer, to give the astronauts more autonomy. During

the Apollo 13 mission, the crew relied on Cohen's AGS to navigate on their return-to-Earth orbit. Today spacecraft like SpaceX's Crew Dragon have an abort system designed to detect an impending booster malfunction and automatically propel the capsule back within 200 nautical miles of Newfoundland or towards the coast of Ireland (i.e. guaranteed water landing). Boeing is building a similar abort system for its commercial crew ship CST-100 Starliner.

Thanks,
Lauren

References

Harwood, W. (2020, May 27). *SpaceX Crew Dragon abort system a major boost for crew safety*. CBS News.

<https://www.cbsnews.com/news/spacex-nasa-launch-abort-rescue-scenarios/>

Smith, K.N. (2019, July 19). *The Women Who Helped Make Apollo 11's Giant Leap for Mankind*. Forbes.

<https://www.forbes.com/sites/kionasmith/2019/07/19/the-women-who-helped-make-apollo-11s-giant-leap-for-mankind/?sh=15306374325b>

Vergun, D. (2020, September 2). *DOD Official Outlines U.S. Nuclear Deterrence Strategy*. DOD News.

<https://www.defense.gov/Explore/News/Article/Article/2334600/dod-official-outlines-us-nuclear-deterrence-strategy/>