

Idaho Falls

The Untold Story of America's First Nuclear Accident

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ILLINOIS

Outline

① Summary

② Evaluation

③ Conclusion



Summary

- Chapter 1: Nuclear Apprenticeship
- Chapter 2: Atomic Energy Meets the Cold War
- Chapter 3: "There Must be Something Wrong at SL-1"
- Chapter 4: Wayward Atoms
- Chapter 5: "Caution: Radioactive Materials"
- Chapter 6: Accident Aftermath
- Chapter 7: Nurder-Suicide?
- Chapter 8: Nuclear Legacy

SL-1

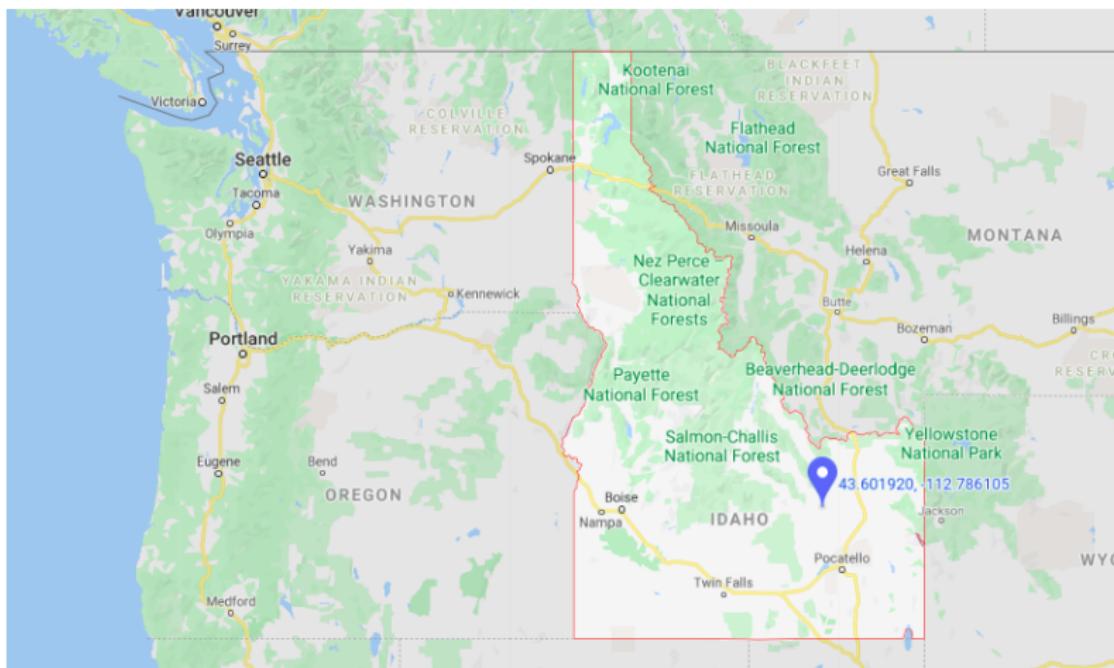


Figure: SL-1 facility location.

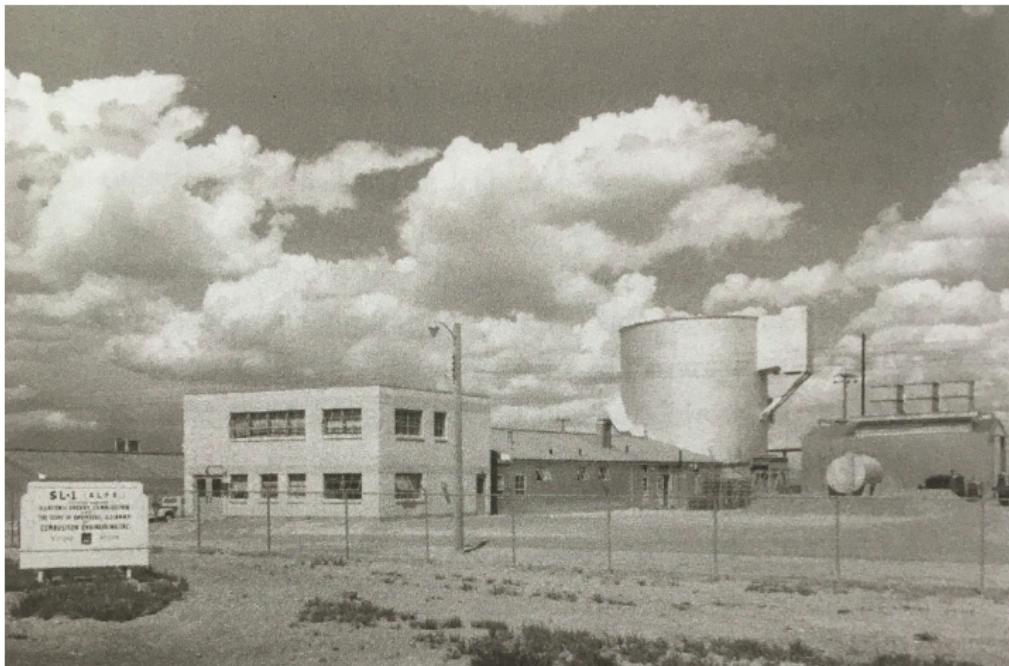


Figure: General view of the SL-1 facility [1].

SL-1

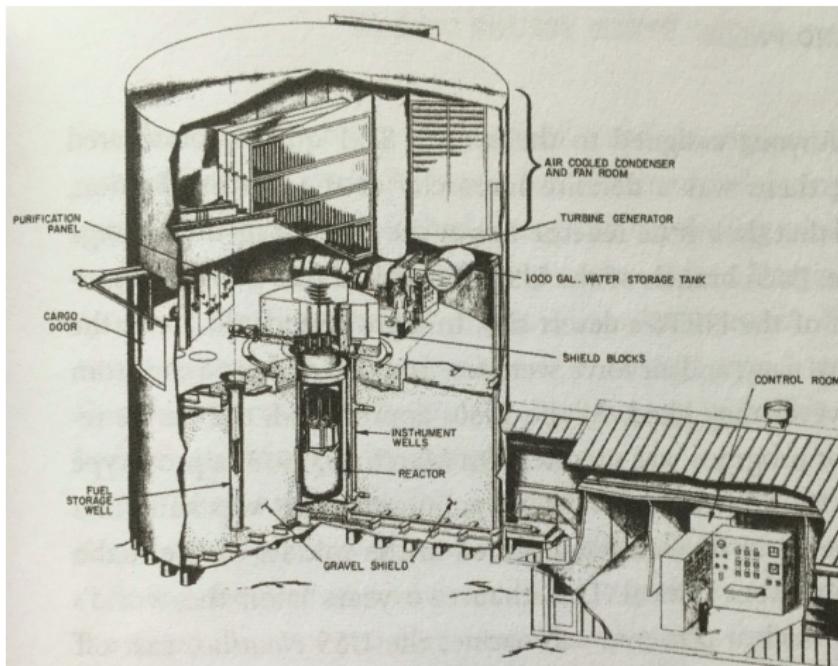
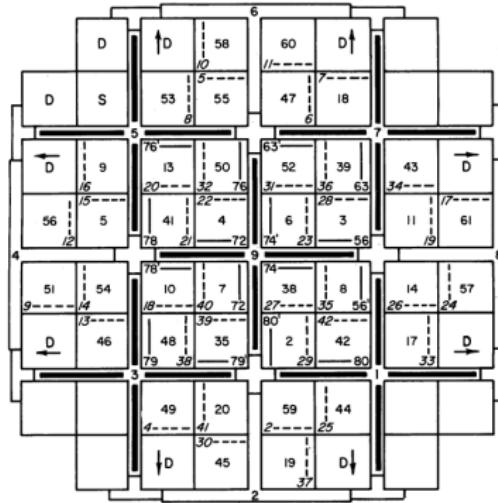
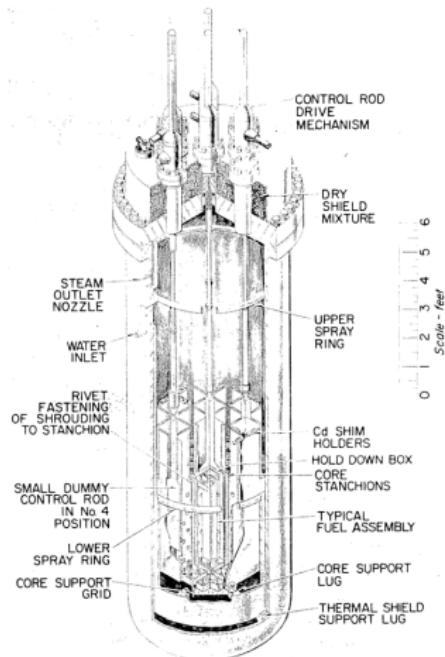


Figure: SL-1 plant perspective [1].

SL-1



KEY:
 FULL STRIP OF BORON - DASH LINE
 HALF STRIP OF BORON - SOLID LINE
 D - DUMMY ELEMENT
 S - SOURCE

Figure: SL-1 reactor vessel [2].

Figure: SL-1 reactor core [2].



"There must be something wrong at SL-1"

- 9:01 pm alarm goes off at the main firehouse.
- Radiation readings too high, no signs of the crew.
- Ed Vallario went inside and saw Jack Byrnes.
- Retrieval of Byrnes and finding of Legg.
- Byrnes was pronounced dead at 11:14 PM.
- Another group found the 3rd member pinned to the roof.

- Retrieval of Legg's body.
- Retrieval of McKinley's body.
- Bodies taken to processing plant.

"We got a reading on the detector, that by todays' standards, you'd have gotten the hell out of there."

Lamprecht.

"I went to take a breath and it was like there was no more oxygen in the tank." *Vallario.*

The accident

- Central rod is withdrawn 20".
- Reactor goes critical at 16.7".
- Fuel plates vaporize, water gets to 3740° F.
- Center fuel elements and central control blade ejected.
- Vessel rises out of its sheath and hits the ceiling.
- Vessel falls down.

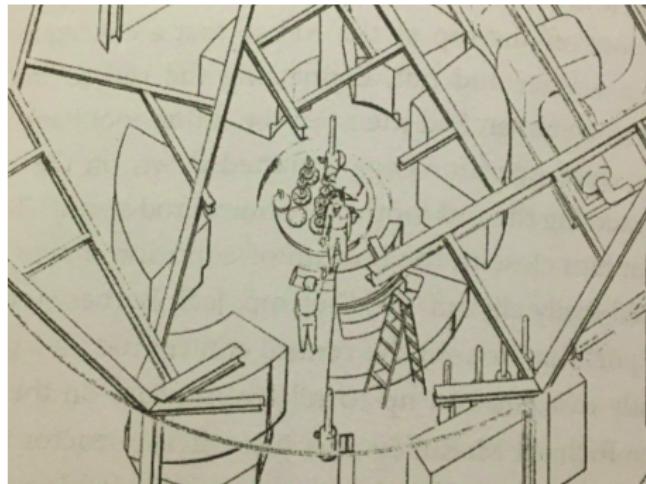


Figure: Reactor crew positions before the accident [1].

Theories

"The direct cause of the incident clearly appears to have been the manual withdrawal by one or more of the maintenance crew of the central control rod blade from the SL-1 core considerably beyond the limit specified in the maintenance procedure. The reason or motive for the abnormal withdrawal is considered highly speculative, and it does not appear at all likely that there will ever be any reasons to change this judgment."

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Author and Audience

- Sources: Interviews and official documents.
- Wide audience.

Technical Evaluation

- Technical explanation is not too extensive.
- A lot of details on the post-accident procedures.
- Description of the autopsies is extremely detailed.

Non-Technical Evaluation

- Anecdotes, feelings, and opinions.
- Several theories on why Byrnes pulled from the rod.
- Verifiability is lost.

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Conclusion



- Must read for nuclear engineers.
- End of the book not great, based on speculation.
- Negative opinion on Byrnes and Legg.
- Easy to read, I recommend it.

References I

[1] W. McKeown.

Idaho Falls: The Untold Story of America's First Nuclear Accident.
ECW Press, 2003.

[2] Nelson Tardiff.

Some aspects of the WTR and SL-1 accidents, April 1962.