

## **Diana, Sherri A. (CDC/NIOSH/EID) (CTR)**

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**From:** Tami Thatcher  
**Sent:** Wednesday, December 16, 2015 1:25 PM  
**To:** NIOSH Docket Office (CDC)  
**Subject:** Pertaining to the 1961 SL-1 accident at the Idaho National Laboratory

Dear NIOSH,

At the July 2015 NIOSH Advisory Board meeting in Idaho Falls, it is notable that a Department of Energy employee repeated, informally, the myth that “no one will ever know what caused the 1961 SL-1 accident.” So strong is the mythology that the Department of Energy embraced in order to divert attention from its important role in safety oversight at the SL-1 reactor and to avert blame from the contractors operating the SL-1.

In the report EGG-CS-11143, “1993 Occupational Radiation Exposure History of Idaho Field Office Operations at the INEL,” by J.R. Horan, Consultant and J.B Braun, October 1993, a section of this report described the January 3, 1961 accident at the Stationary Low Power Reactor (SL-1). Specifically, for the accident description the report states: “Experienced technician manual withdrawal of central control rod 80 times the distance specified by the Standard Operating Procedure.” Probable causes stated: “Emotionally unstable operator deliberately withdrew control rod at a rate and distance beyond reason.”

These statements far exceed any referenced document cited. The fact is that documents describing the accident never say the rod was withdrawn 80 times the distance in the procedure. The only distance specified in the operating procedure was to not lift over 4-inches. Did Horan mean to imply that the rod was lifted 320 inches by the operator?

None of the references documents describe any of the three operators as emotionally unstable. The man most often implicated in rumors had marital problems. But the autopsy report found that his hands were not damaged; he could not have lifted the control rod. It was the trusted leader of the crew who overlifted the rod that fateful winter evening.

The autopsy report is posted at <http://www4vip.inl.gov/library/docs/lams-2550.pdf> and at a further report of the incident at [www.environmental-defense-institute.org](http://www.environmental-defense-institute.org).

From p. 56 of autopsy report of the SL-1 crewmen <http://www4vip.inl.gov/library/docs/lams-2550.pdf> “While this reconstructed scene probably is not exactly correct, it appears to be sufficiently well fixed by the nature of the wounds to warrant the important conclusion that these men were carrying out their assigned task in accordance with the standard operating procedures in which they had been trained.”

From p. 57: “The distribution and nature of these wounds, along with chemical dosimetric studies of hair samples, enabled a logical reconstruction of the scene at the time of the explosion, which led to the conclusion that the explosion occurred while standard operating procedures were being followed.”

The June 1961 Joint Committee on Atomic Energy SL-1 Atomic Energy Commission Investigation Board Report in addressing responsibility for the incident: “We specifically absolve the military cadre, as such, from any responsibility.”

The EG&G report by Horan makes no mention of the multitude of design and operational problems with the SL-1 reactor or the numerous rod sticking events. There had been 7 instances of the center rod sticking and 8 to 12 instances for each of the other rods. And very importantly, that the rods had stuck precisely where the SL-1

rod stuck, probably due to a weld discontinuity, and pages in an Appendix showing this fact just happened to be absent from the report.

The 84-lb rod had to be lifted from a squatty position with the attached lifting tool. Mock-up tests found that overlift of the rod could easily occur in an effort to free a stuck rod. The lifting of the rod far enough and fast enough to result in prompt criticality of the reactor did not require maximum effort. The partially raised rod, as held by the c-clamp, required only about 16 inches of travel to achieve the 20-inch withdrawn position and was lifted in less than a third of a second. But they didn't know what force was needed to free the stuck rod.

During the investigation, little emphasis was given to the sticking prevalent in the shutdown position when a portion of the control blade extended below the core and the shroud. As the lower portion of the control blade was pulled up into the shroud, evidence would later be found of pre-accident "scouring" marks on more than one blade. It points to serious material condition and design flaws reducing the clearances needed for control blade movement.

There were weld discontinuities and shroud cut-outs for the lower portion of the rod to have interference. In fact, the rods had stuck many times at this very position. Yet, inexplicably later investigations limited to Idaho laboratory contractors or Department of Energy personnel ruled out sticking as a cause of the accident.

Existing safety/hazard analysis had never been conducted to determine the conditions that could cause a prompt criticality. The cold temperature of water in the reactor vessel that night, days since operating the reactor was later found to have made the accident ten times worse. There was really no way the operators could have conceived of the severity of the event.

The entire description by Horan in the EGG report was aimed at shifting blame from leadership at the Idaho Field Office. John Horan, formerly in charge of Health and Safety at the Idaho Field Office of the AEC, now known as the Department of Energy Idaho Field Office, was later hired by NIOSH.

The credibility of John Horan's assessments, so often used by NIOSH as Horan became a consultant for NIOSH, must be taken into account when reading his assessment of INL worker doses and radiation release consequences.

The cleaned up SL-1 buildings approved for continued use by the Department of Energy after the SL-1 accident were later found during CERCLA cleanup investigations decades later to be hopelessly contaminated and had to be demolished. There might have been something less than adequate about the way radiation monitoring was performed in early decades and not just at the Chemical Processing plant.

Tami Thatcher