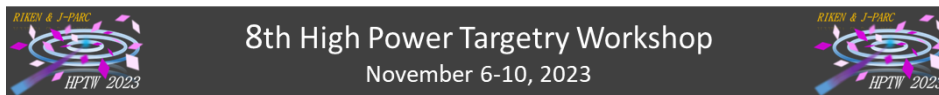


## 8th High Power Targetry Workshop (HPTW2023)



Contribution ID: 80

Type: **Poster**

# Impact and Lessons Learned from the Mercury System Filling Incident at the Spallation Neutron Source

*Tuesday, 7 November 2023 17:41 (1 minute)*

A routine mercury loop filling operation was underway early on the morning of March 21st, 2019. That operation resulted in a severe transient from a previously unidentified accident scenario. Understanding the cause, restoring systems, and addressing the safety issues took time, and the SNS could not resume operations for three months. An undetected leak from a mercury pipe led to high-pressure gas from a storage tank entering the loop and over-pressurizing the process loop. This gas pushed highly radioactive mercury out through the pressure relief and into gas supply lines. Nearly all of the mercury lost from the process loop was safely contained by the shielded service bay, where over 360 liters of mercury was recovered from the collection basin built into the floor. However, some small amount of mercury, though contained, was pushed to an area without adequate shielding. Like all such events, this incident resulted from a confluence of many factors, some of which date back to the fabrication of the SNS. This presentation will provide the history of this event, including the technical explanation and human factors. It will also cover the effects of the event, including the creation of a radiation hazard of 2.3 Sv/hr near our user-occupied space. The presentation will also cover how the root causes were addressed to ensure the facility could be restarted safely. The overarching goal of the presentation is to share lessons learned from this significant event to aid other facilities in avoiding similar incidents.

### Themes for the contribution

5 Target facility challenges:

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**Session Classification:** Poster session