

**RPAC 2025W Presentation
HP Failed Fuel Experiences &
Lessons Leared**





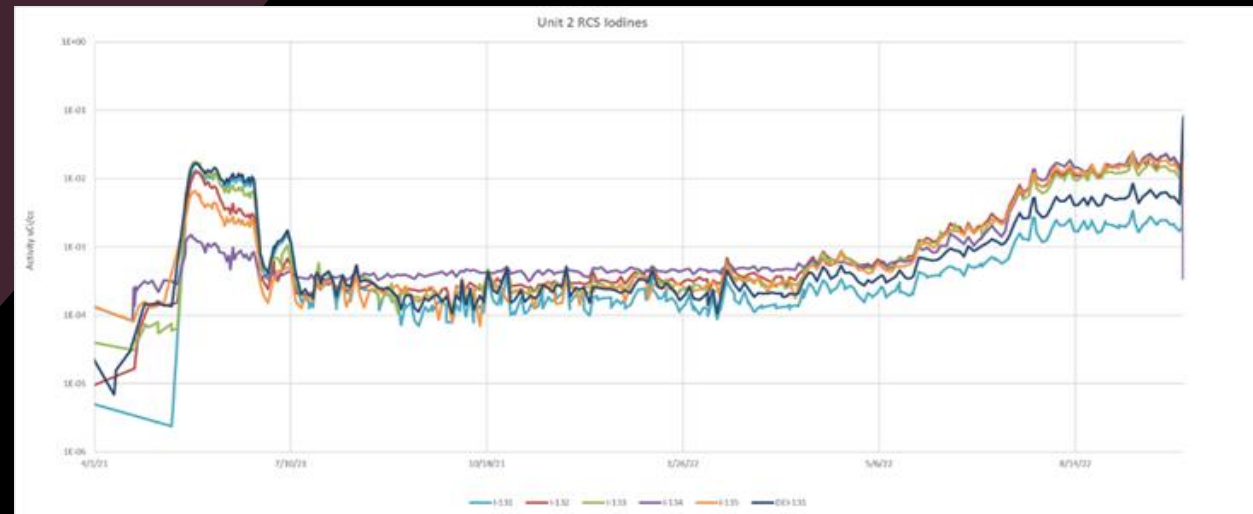
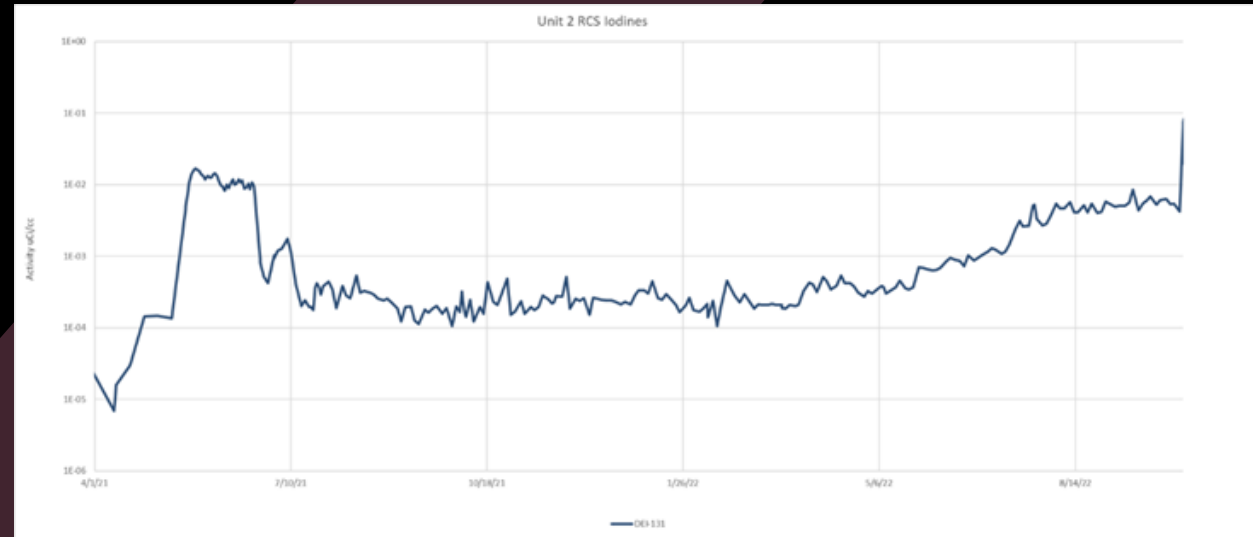
RP FAILED FUEL EXPERIENCES AND LESSONS LEARNED

Eric Hood – RP Supervisor (ALARA)
South Texas Project
eghood@stpegs.com





Failed Fuel – How it was found?





RP Online Response

Performed verification surveys in areas that could possibly be affected

- Chemical and Volume Control System
- Waste Processing
- Hot Chemistry Lab

There were also indications on Effluent Monitors and in the Reactor Containment Building.

A Continuous Air Monitor with Noble Gas monitoring was set up in the Hot Chemistry Lab.

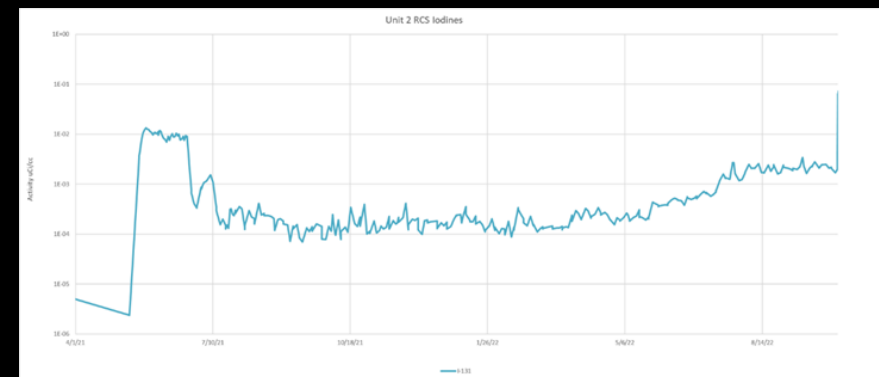
Operations understanding impacts is essential.

Started an RP Failed Fuel planning process.



Station Online Response

- Started a cross functional Failed Fuel Team led by Fuels Engineers.
- Gathered OE from other sites.
- Operations implemented:
 - More frequent RCB purges to reduce airborne activity.
 - Frequent waste gas processing to reduce RCS activity.





RP Failed Fuel Outage Preparation

- Established a RP centered team to develop mitigation plans.
 - Cross functional with RP, Chemistry, Operations, Outage, Refuel, and Training involvement.
 - Developed communications to inform RP and the Site in general on conditions.
 - Failed Fuel Refresher for RP Organization
 - Xenon gas basics
 - Site Fuel Defect Communication
 - Obtained OE and Guidelines (EPRI, INPO) for Failed Fuel.
 - Determine procedure change needs.
-



RP Failed Fuel Outage Preparation

- Established a RP centered team to develop mitigation plans. (Continued)
 - Developed detailed plans of action.
 - Tracking and Planning for Transuranics (Alpha), Iodine, Noble Gas
 - Ventilation contingencies
 - RCB Evacuation
 - Noble gas contamination events
 - Return to work criteria
 - Determine instrument/equipment needs.
 - Determine training needs.
-

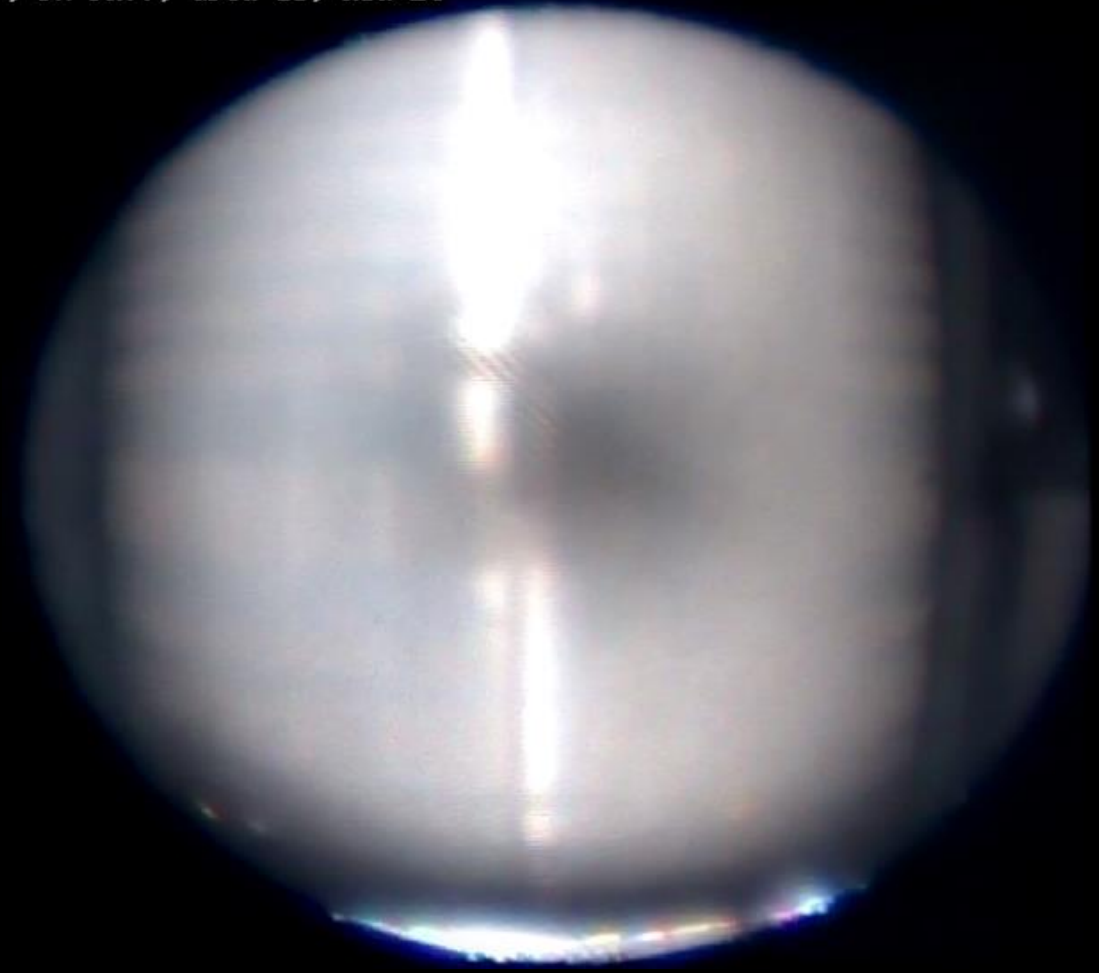


FA PR77, Grid 10, Rod E4

THE FUEL DEFECT

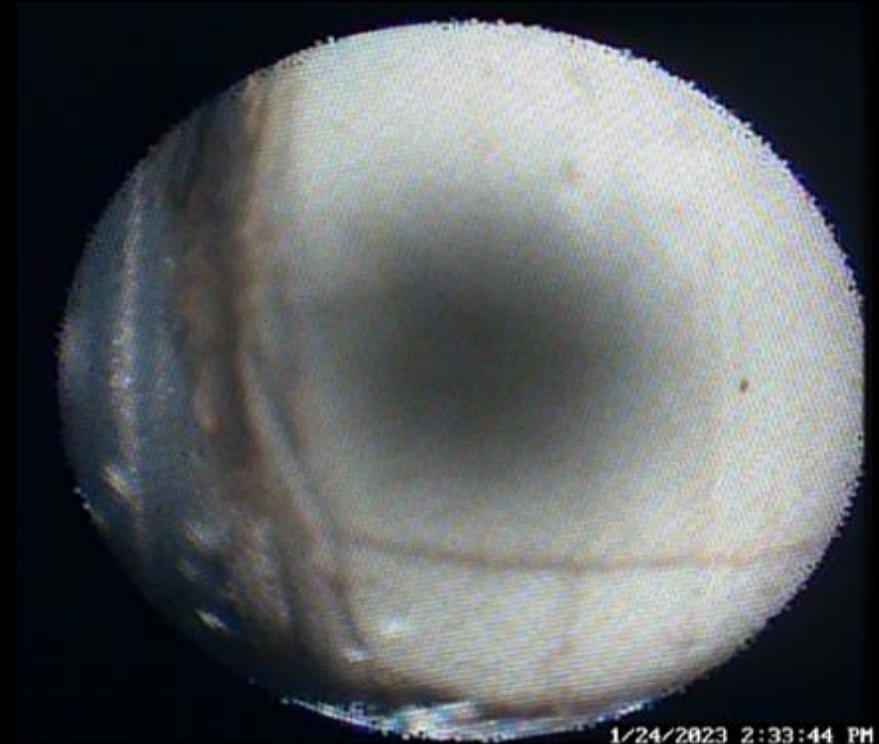
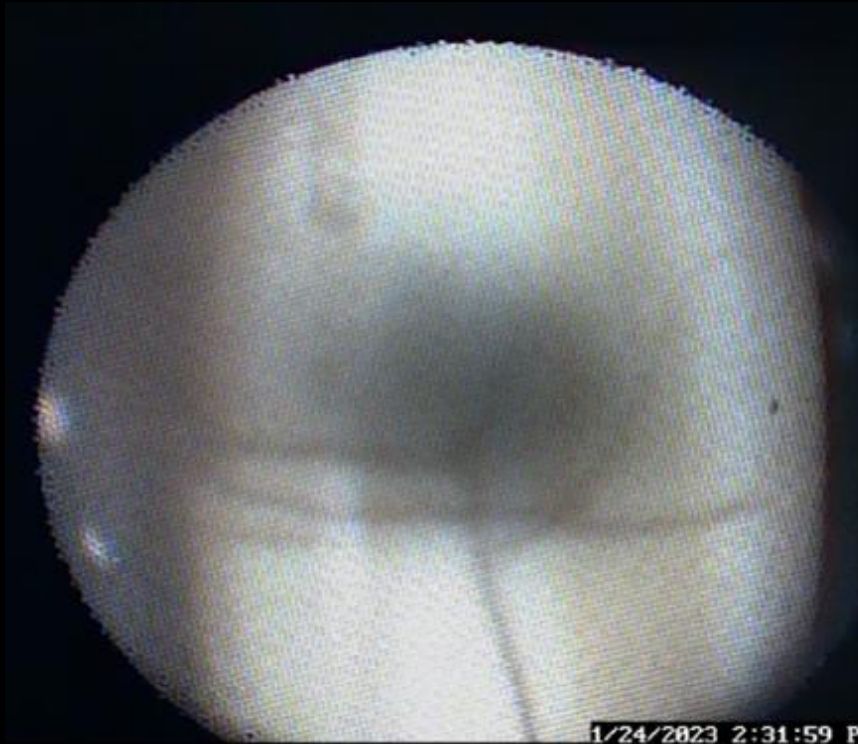
Multiple fuel defect levels.

STP never rose above the 2nd action level based on Iodine and Transuranic identification.



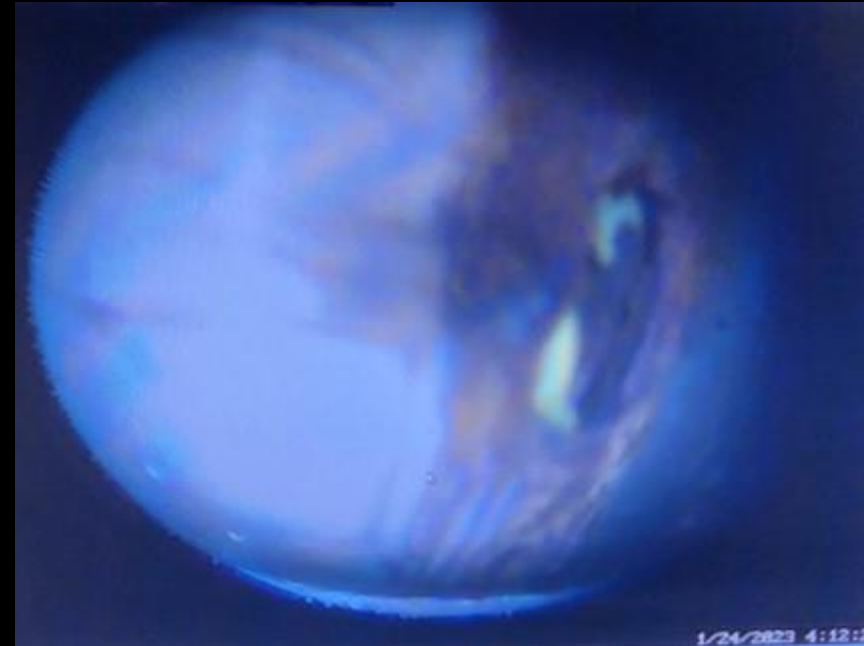
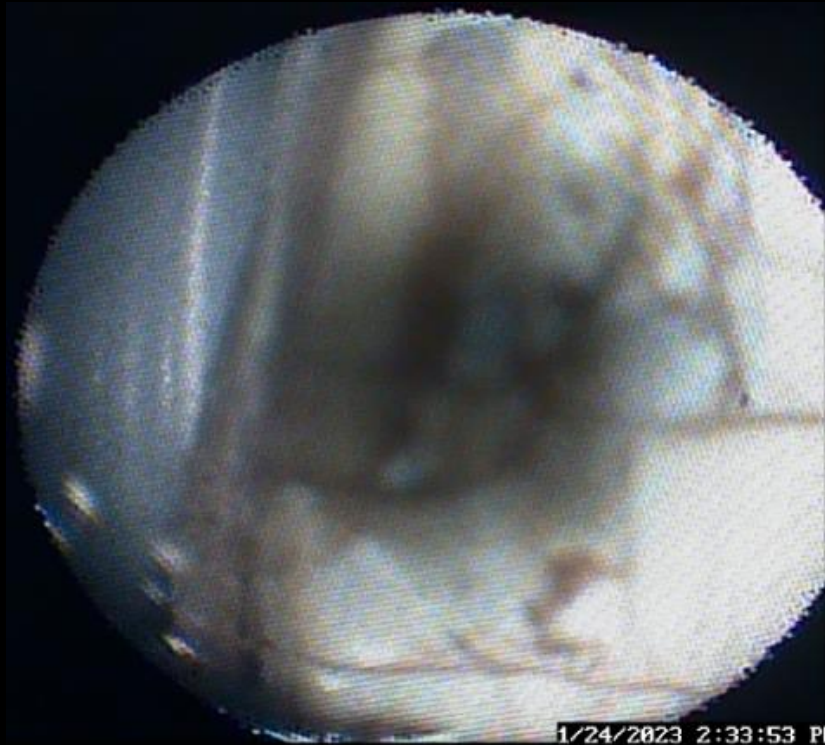


Fuel Defect – One Internal Rod





Fuel Defect – One Internal Rod





How Did It Go?

- 1st FF Outage was a 100% inspection S/G outage.
 - 2nd FF Outage had more than normal scope, but no additional RCS openings.
-



Contamination

- Due to the size of the defect STP barely detected any Transuranic – Only 1 Alpha Level 2 area found, which was then analyzed by GEL and Alpha Level 2 criteria was not met.
 - PCE's
 - Level 1 – 28 5
 - Level 2 – 4 0
 - Level 3 – 2 0
-



Dose

- 1st FF Outage: 64 Rem projected, 63.66 Rem actual.
 - 2nd FF Outage: 41 Rem projected, 41.63 Rem actual.
 - During the 1st FF Outage a large build up of highly contaminated trash was a problem:
 - More than 2 Rem to move the trash.
 - 2 Dose alarms to Decon personnel.
-



Airborne – Noble Gas

- 1st FF Outage
 - Initial air sample during PZR venting indicated 99 DAC prior to count finishing.
 - CTMT evacuated, but work started again quickly.
 - Backlog of workers with Noble Gas contamination resulting in WBC.
 - Noble Gas contamination was an issue with all major breaches.
 - 2nd FF Outage
 - No sustained Noble Gas airborne
 - Ventilation to move the gas was set closer of system breach points to move the gas to RCB purge.
 - Coordinated with Outage Management and Operations to capitalize on system conditions.
-



Airborne - Iodine

- 1st FF Outage
 - HEPA with Charcoal set up at all major vent points, so it was nuisance over actual concern.
 - Night shift encountered Iodine transients not seen on Days. This led to Posting issues.
 - 2nd FF Outage
 - HEPA with Charcoal set up at all major vent points.
 - Use of Normal Purge and good communication led to no Iodine nuisance issues.
-



Lessons Learned

- OE suggested that Normal Purge could not be used prior to the 1st FF Outage. This is Site specific and Normal Purge was the most effective control for Airborne. During the 2nd FF Outage Normal Purge was on constantly.
 - Pre-Planning process identified many issues that were able to be dealt with. However, it can over complicate things. The 2nd planning process eliminated extraneous issues, kept it to RP actions only.
 - Operations control of water is essential. Increased ventilation led to condensation Ops was not ready to deal with. Operations was better able to control water.
 - Minimize personnel in CTMT during major system breaches.
-



ANY QUESTIONS?

Email – eghood@stpegs.com