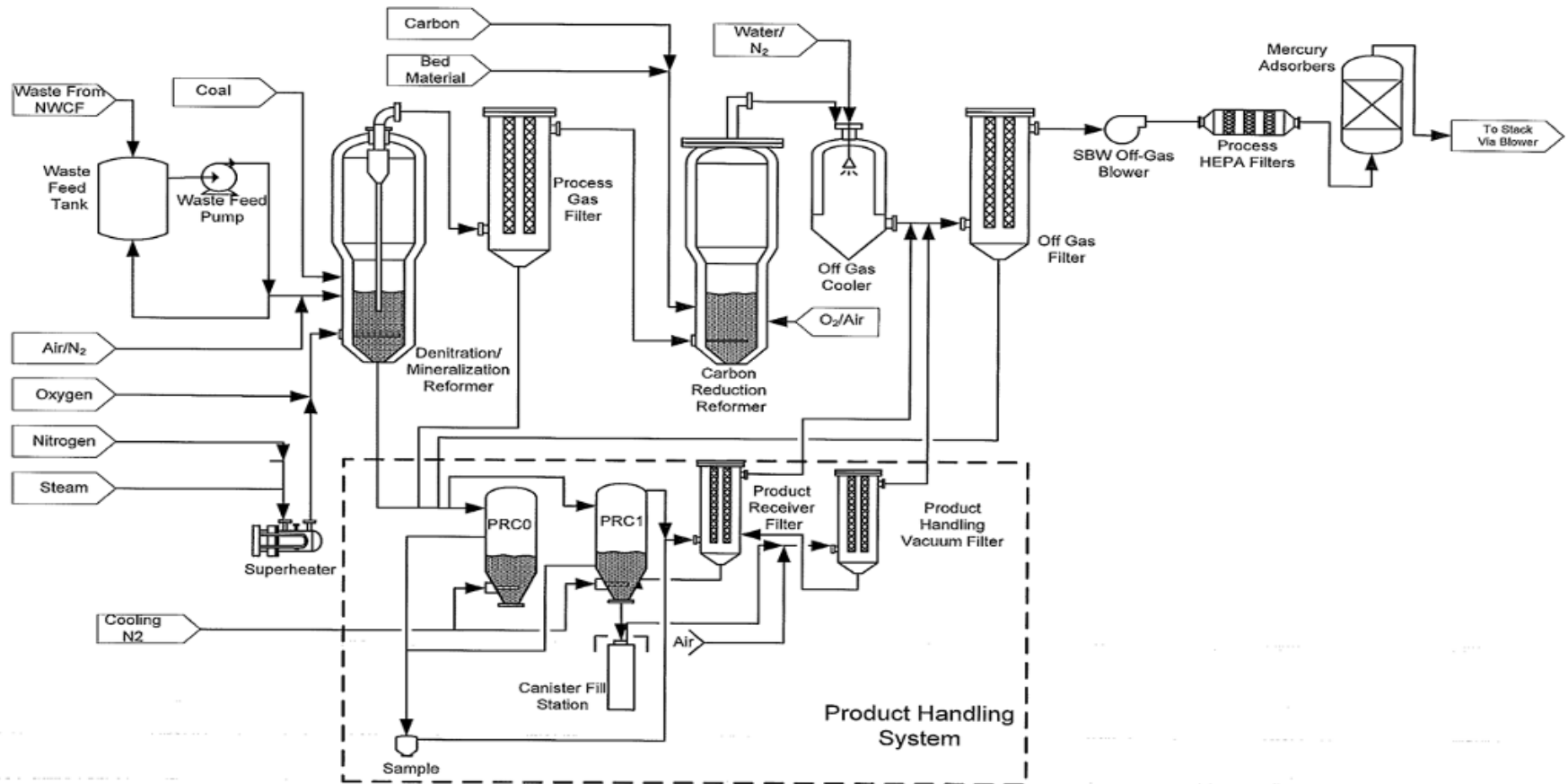

Integrated Waste Treatment Unit Citizens Advisory Board Presentation September 19th, 2012

Shawn Hill
IWTU Operations Activity Manager



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Integrated Waste Treatment Unit Process



Facility and Process Description

(refer to separately provided process flow diagram)

- **New Hazard Category 2 Nuclear Facility:**

- Process Building with reinforced concrete process cells inside a structural steel building, along with a Product Storage Building

- **Steam Reforming Process:**

- First of its kind, full scale steam reforming process; reformer vessels use superheated steam and nitrogen gas, along with coal and coke, to convert acidic radioactive liquid waste to solid carbonate particles

- **Reformer Vessels:**

- Denitration Mineralization Reformer (DMR)
- Carbon Reduction Reformer (CRR)

- **Process Filters:**

- Off-Gas Vessel Filters: Process Gas Filter (PGF) and Off-Gas Filter (OGF)
- Product Filters: Product Receiver Filter (PRF) and Product Handling Vacuum Filter (PHVF)
- Process Off-Gas High Efficiency Particulate Air (HEPA) Filters



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Event Description

- Late May 2012--IWTU plant heat-up began as part of the post-CD-4 startup testing program
- June 9, 2012--PGF filter D/P spikes, causing filter bundles to lift; contractor continued operations—convinced filter bundles re-seated, based on process parameters, without investigation; DOE management was not informed and was unaware of the June 9 event
- June 16, 2012—
 - OGF filter bundles lift
 - Coal fines and bed material are released from the OGF
 - Process HEPA filters load up and fail
 - Coal fines and bed material are released from the stack



Off-Gas Filter Photo—Top of Filter Bundle Tubesheet, Post-Event



Event Investigation

- June 25 thru July 6, 2012—Event investigation team conducted reviews, led by H. Handfinger, URS
- August 2, 2012—Report issued; causes:
 - **Direct Cause:**
 - OGF filter bundle lift due to excessive wood-based charcoal fines carryover, blinding the OGF filters, allowing solids to pass through the OGF to the HEPA filters, causing their loading and breach
 - **Root Causes:**
 - Lack of adequate technical direction on expected operating envelope, parameters, and indications
 - Design deficiencies
 - Inadequate oversight and management systems (technical inquisitiveness)



Facility Recovery—*Modifications*

Facility Modifications Include:

- Process filter bundle restraints to prevent lifting
- Product Receiver Filter and Product Handling Vacuum Filter pressure reliefs
- Process filter fuse removal
- Carbon Reduction Reformer modification to inject oxygen lower in vessel
- Install process off-gas High Efficiency Particulate Air Filter pre-filter differential pressure transmitters (allows Rapid Shutdown System trip)
- Evaluate and modify the Rapid Shutdown System alarm and trip strategy



Path Forward

- HAZOP and Collective Significance Review September 2012
- Integrated Corrective Action Plan to DOE September 14, 2012
- Process System Modifications Completed November 2012
- Readiness Determination for Recovery Phase December 2012
- Heat-up and Testing Begins January 2013
- Radioactive Waste Processing Begins April 2013



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Questions?



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