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Protecting People and the Environment

NRC
Augmented Inspection Team
Exit Meeting
for
Nuclear Fuel Services

March 2, 2010

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Agenda

6:00 pm	Introduction	NRC NFS
6:05	NRC AIT Presentation	NRC
6:40	NFS NRC Discussion	NRC NFS
7:30	Conclusion	NRC

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This is a category 1 meeting in which the public is invited to observe and will have one or more opportunities to communicate with the NRC after the business portion, but before the meeting is adjourned.

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NRC's Goal Today

- To convey the results of NRC's Augmented Inspection of the October 13, 2009 event at Nuclear Fuel Services (NFS)

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Augmented Inspection Team

- George Hopper – Team Leader
- Team Members:
  - Leonard Pitts, Fuel Facility Inspector
  - Omar Lopez, Fuel Facility Inspector
  - Galen Smith, Senior Resident Inspector
  - Manuel Crespo, Senior Fuel Facility Inspector
  - Steve Subosits, Senior Resident Inspector
  - Tim Chandler, Reactor Resident Inspector
  - Wayne Schmidt, Senior Reactor Analyst, R-I

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Background to the Event

- NFS uses a **bowl cleaning station** to remove uranium caked inside centrifuge-bowls by circulating nitric acid through the bowls.
- This process produces nitrogen compound off-gases (NOx) as a by-product of the nitric acid dissolution process.

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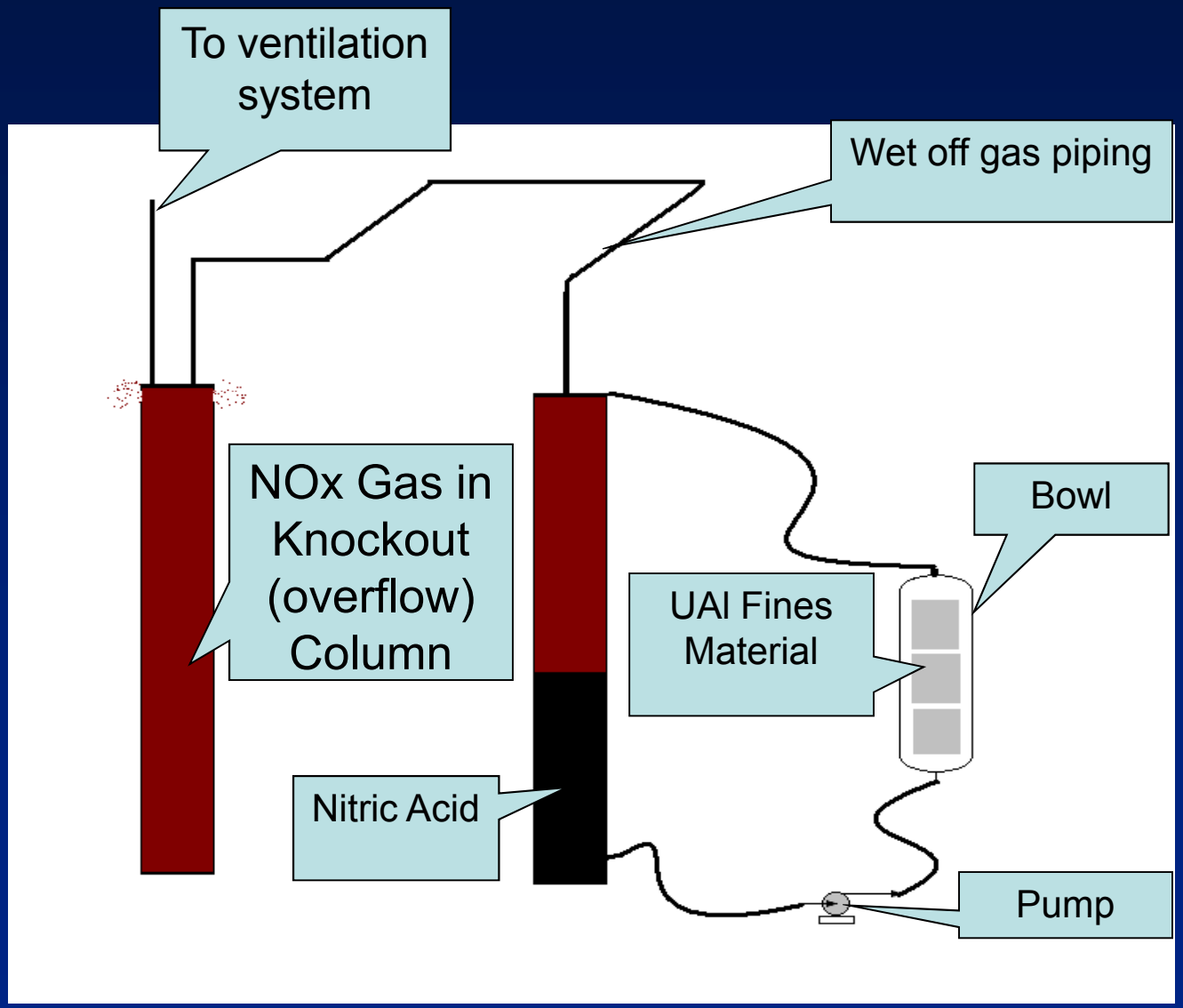
Background to the Event

- NFS Laboratory analysis initially determined that fines should not be processed in caustic dissolution

- Subsequent analysis determined a method to process fines using nitric acid

- On October 12, NFS changed its procedures to process fines material in the **bowl cleaning station**

Simplified Bowl Cleaning Station Diagram



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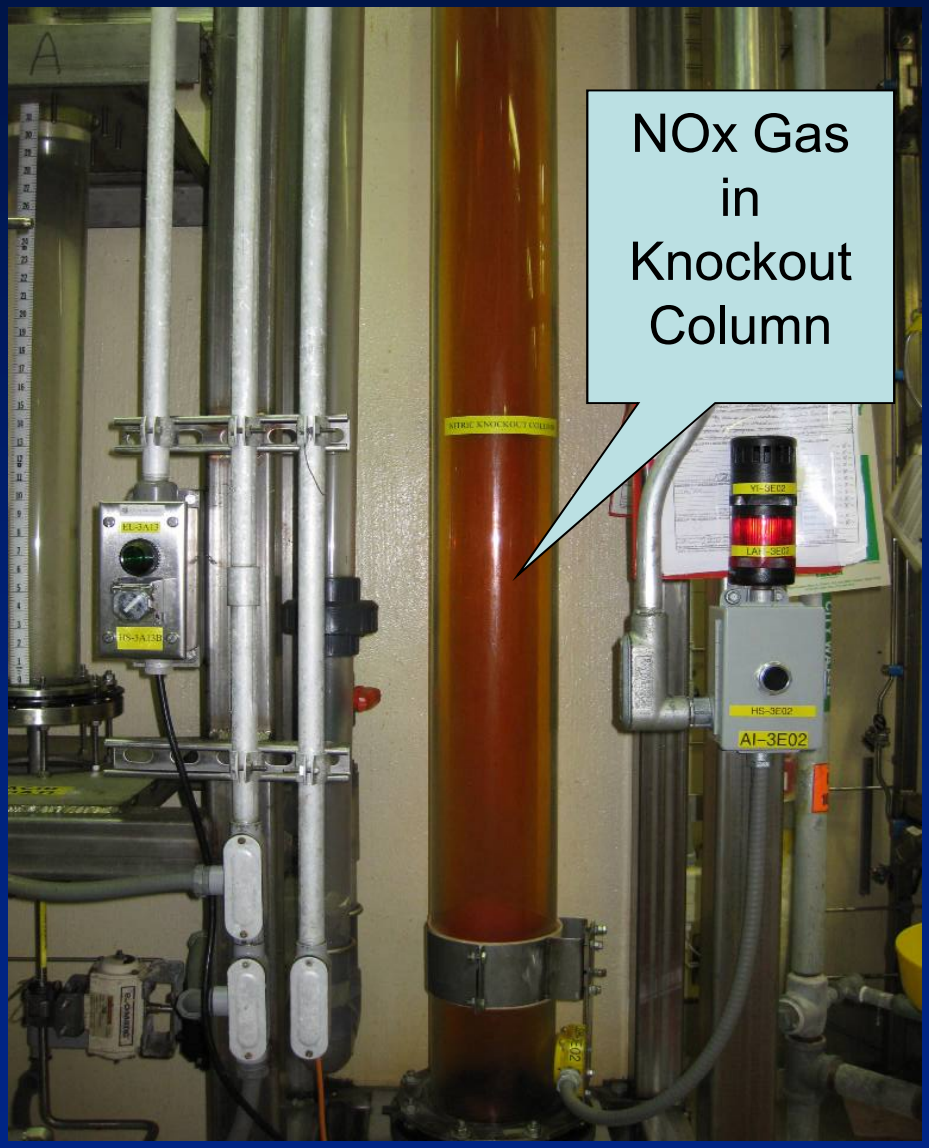
Event Description

- On October 13, operation of the bowl cleaning station with the fines material began producing unexpectedly high levels of NOx.
- These gases triggered the NOx detectors nearby, which prompted an evacuation of the immediate area.
- Based on re-entry data and remote NOx detector readings, the NOx levels at the worker level were not significant.

NOx Gas in Column



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Piping Deformation

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Event Description (Cont.)

- The reaction proceeded to completion within the next several hours.
- Processes involving the deformed piping remained shut down.
- NFS planned to isolate the system to support restart of the other process systems.

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NRC Response

- The NRC was concerned with NFS' recovery plans.
- A region based inspector was immediately dispatched.
- An NRC Special Inspection was dispatched to the site on October 19.

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NRC Response (Cont.)

- On October 19, NFS reported to NRC that NOx generation was higher than previously analyzed.
- The higher risk to workers led to upgrading the inspection to an Augmented Inspection Team (AIT).

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AIT Findings

- Immediate actions taken by NFS were adequate.
- Actual safety consequences of the event were low.
- Potential safety consequences to workers were high.
- Potential safety consequences to the public and environment were low.

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AIT Findings (Cont.)

- NFS' initial decision to initiate system recovery activities on October 13 lacked adequate technical basis and appropriate management review.

- NFS subsequently developed a plan that if rigorously implemented was adequate to begin system recovery, investigate the event, and develop corrective actions.

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AIT Findings (Cont.)

- NRC's root cause analysis found the change process was not adequately implemented.
- Primary root causes
  - Lack of management oversight
  - Lack of questioning attitude
- Contributing causes
  - Production pressure
  - Poor communications

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AIT Findings (Cont.)

- Procedure change requests incorrectly classified as urgent – URI 1
- Management reviews inadequate – URI 2
- Technical reviews inadequate – URI 3
- Safety reviews inadequate – URI 4

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AIT Findings (Cont.)

- Inadequate change review documentation – URI 5
- For the October 13 event, NFS had insufficient controls in place to meet NRC regulations – URI 6
- Calculations were inadequate for a separate safety control related to NOx generation – URI 7
- NFS failed to properly identify and control required safety controls – URI 8

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Additional AIT Findings (Cont.)

- NFS' November 30 restart decision was less than adequate
  - Incomplete extent of condition
  - Incomplete causal analysis led to an incomplete extent of cause review
  - Unresolved technical issue relating to a safety control

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Additional AIT Findings

- An upcoming material control and accountability inventory led to production pressure
- Procedure changes used verbal communications to justify process changes
- Laboratory testing sample size inadequate and non-representative

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AIT Summary

- Multiple error prevention barriers failed
- Significant process changes made without compensating for increase in risk to workers
- Decision to restart on November 30 lacked a rigorous technical basis and appropriate management review
- Performance issues will be reviewed for possible enforcement

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Closing Remarks

- NRC performed an interim performance assessment based on:
  - Overarching nature of AIT results, and
  - Recent performance issues including the unrelated fire that occurred in November in the Commercial Development line
- NRC Confirmatory Action Letter issued on January 7, 2010

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The Next Steps

- AIT report to be issued within 30 days
- Findings from this inspection will be processed through enforcement at a later date
- NRC is inspecting the corrective actions for the AIT findings
- In addition, NRC staff has begun assessing NFS restart readiness