Unit Vent Isokinetic Nozzle Cleaning

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Problem Statement

- Previously identified low flow conditions in the Unit Vent effluent pathway sample lines had degraded to not meet acceptance criteria (failed with 17 test deficiencies).
- Gaseous sample flow was at 1.33 scfm.
- Required sample flow was 1.50 – 1.84 scfm.
- On 4/30/13, GTRE21B gas channel was declared nonfunctional.

Problem Statement

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

TR 3.3.3 The accident monitoring instrumentation for each Function shown on Table TR 3.3.3-1 shall be FUNCTIONAL.

APPLICABILITY: According to Table TR 3.3.3-1.

D.	Unit Vent - High Range Noble Gas Monitor with required channel nonfunctional.	D.1 Initiate an alternate method for monitoring the appropriate parameters.	72 hours
		AND	
		D.2 Restore required channel to FUNCTIONAL status.	7 days
F.	Required Action and associated Completion Time not met.	F.1 Initiate Condition Report.	Immediately

Problem Statement

TABLE 3-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS FUNCTIONAL	APPLICABILITY	ACTION 11/12
1. Unit Vent System			
a. Noble Gas Activity Monitor - Providing Alarm (GT-RE-21B)	1	*	40
b. Iodine Sampler (GT-RE-21A, GT-RE-21B)	1	*	43
c. Particulate Sampler (GT-RE-21A, GT-RE-21B)	1	*	43
d. Flow Rate	N.A.	*	45
e. Sampler Flow Rate Monitor	1	*	39

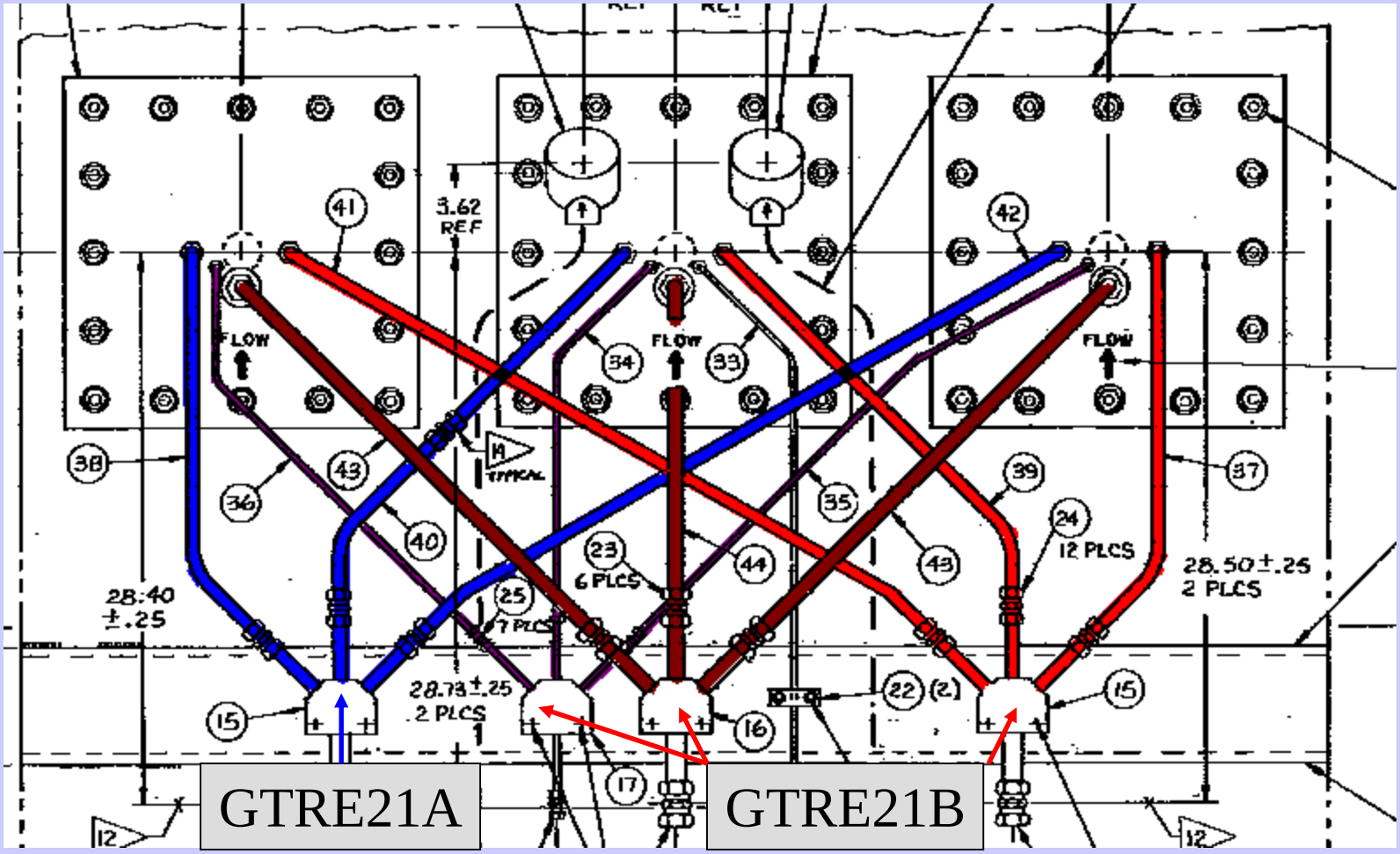
ACTION 40 - With the number of channels FUNCTIONAL less than required by the minimum channels FUNCTIONAL requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once per 12 hours and these samples are analyzed for radioactivity within 24 hours. *11/12*

Work Planning – Emergent

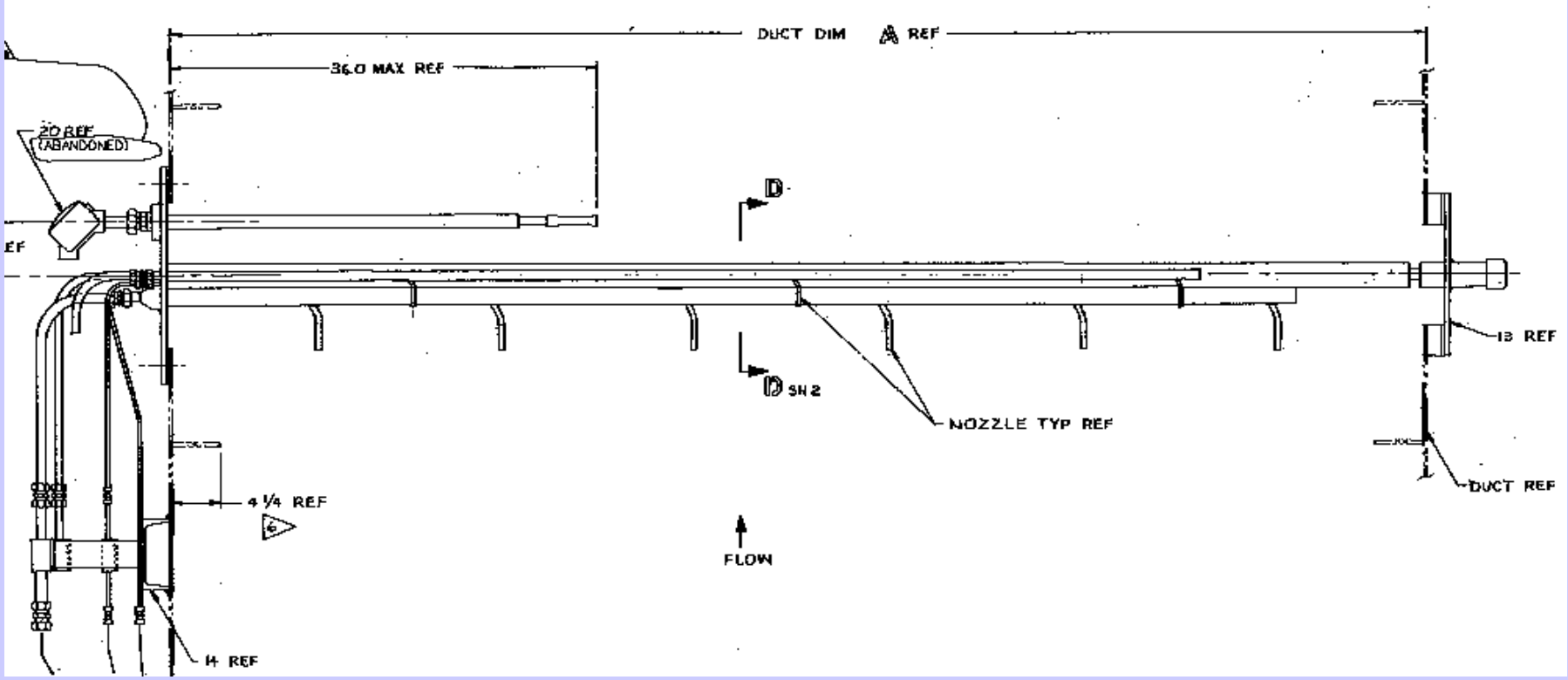
- Benchmarking from the Radiation Monitor System engineer was performed through a General Atomics / RMS Users Group request for information.
- One plant identified: McGuire
- This plant had been identified as cleaning needs on a cycle based PM and owned a spare set of isokinetic nozzles for the PM work.

Isokinetic Nozzles

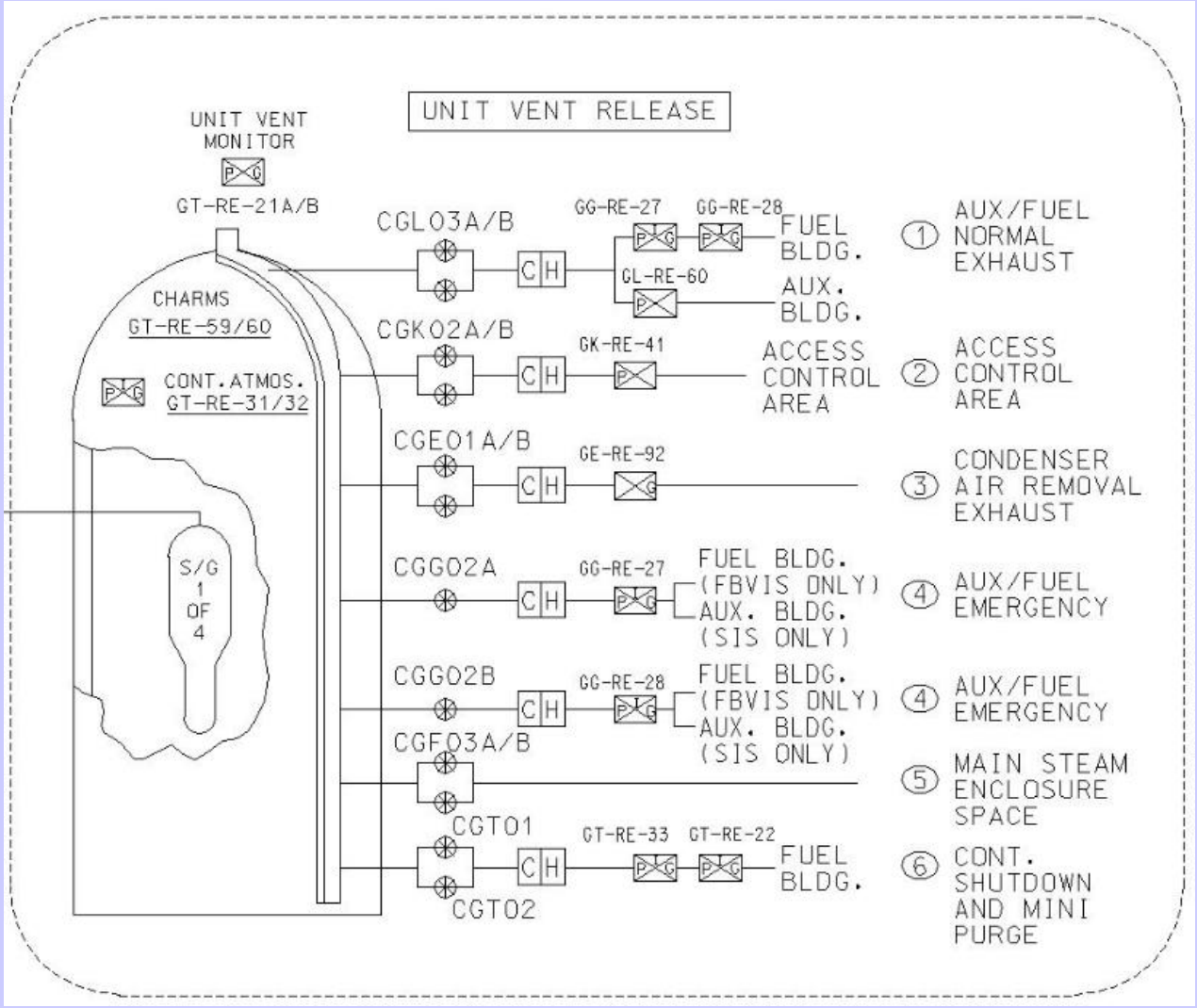
Work Planning – Emergent



Work Planning – Emergent



Work Planning – Emergent



Work Planning – Emergent

- ODCM / Effluent Sampling Considerations:
  - Isokinetic nozzles ensure representative sampling of multi-phase streams, i.e. particulate/gas.
  - Nozzles cannot be taken out “one-at-a-time”, i.e. GTRE21A or 21B only.
  - Nozzle banks could not be taken out “one-at-a-time” due to center bank and crossovers.
  - Any immediately available, alternate sampling in the unit vent duct would be non-isokinetic.

Work Planning – Emergent

- Effluent Flow / Sampling Plan:
  - An Operations Procedure, SYS GT-300 “Unit Ventilation Outage Fan Shutdown”, shuts down all fans feeding into the unit vent and redirects, through negative pressure, to the Radwaste Building ventilation (GHRE10A/B). (**Primary Effluent Path**)
  - Normal alternate sampling, via gas sample cart with P/I filter holders, reversed sample flow to draw through the discharge line (immediately downstream of all ventilation inputs to the unit vent) (**Monitoring for Unplanned Release)**

Work Planning – Emergent

- Additional Requirements / Contingencies :
  - Containment purge performed twice prior to commencing unit vent outage and starting work.
  - Prior to and during work, recorded flows and collected / counted all filters associated with radiation monitors on all pathways acting as sources to unit vent. (**No abnormal activity recorded**)
  - Two calibrated gooseneck samplers, with P/I filter holders and 75’ of sample hose, on standby for additional monitoring capabilities (**One Clean, One ‘Dirty’**)
  - Back-up sample pumps (**3**)
  - **And… Beautiful Weather….**

Work Execution

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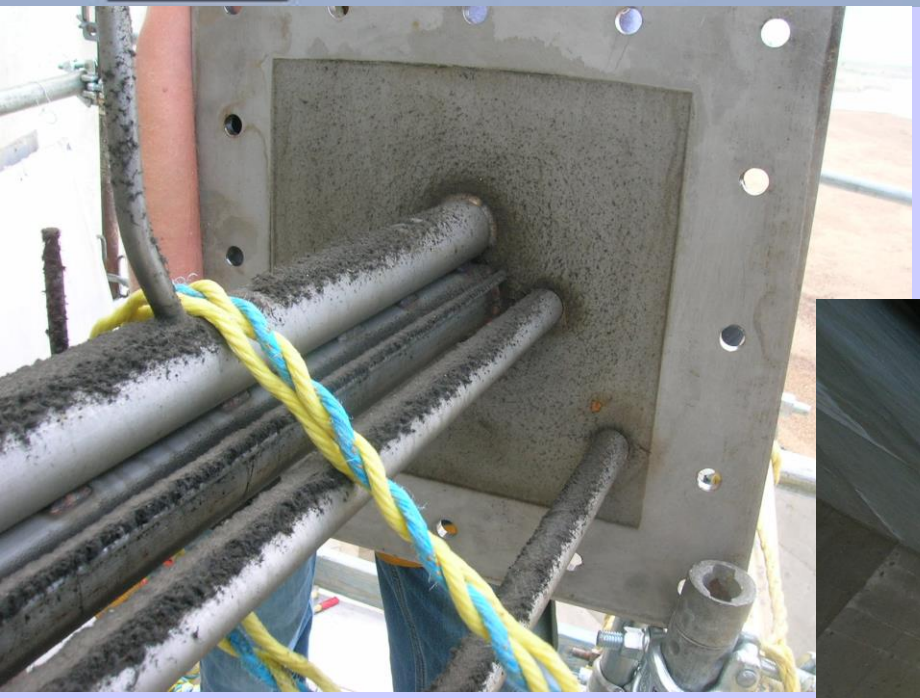
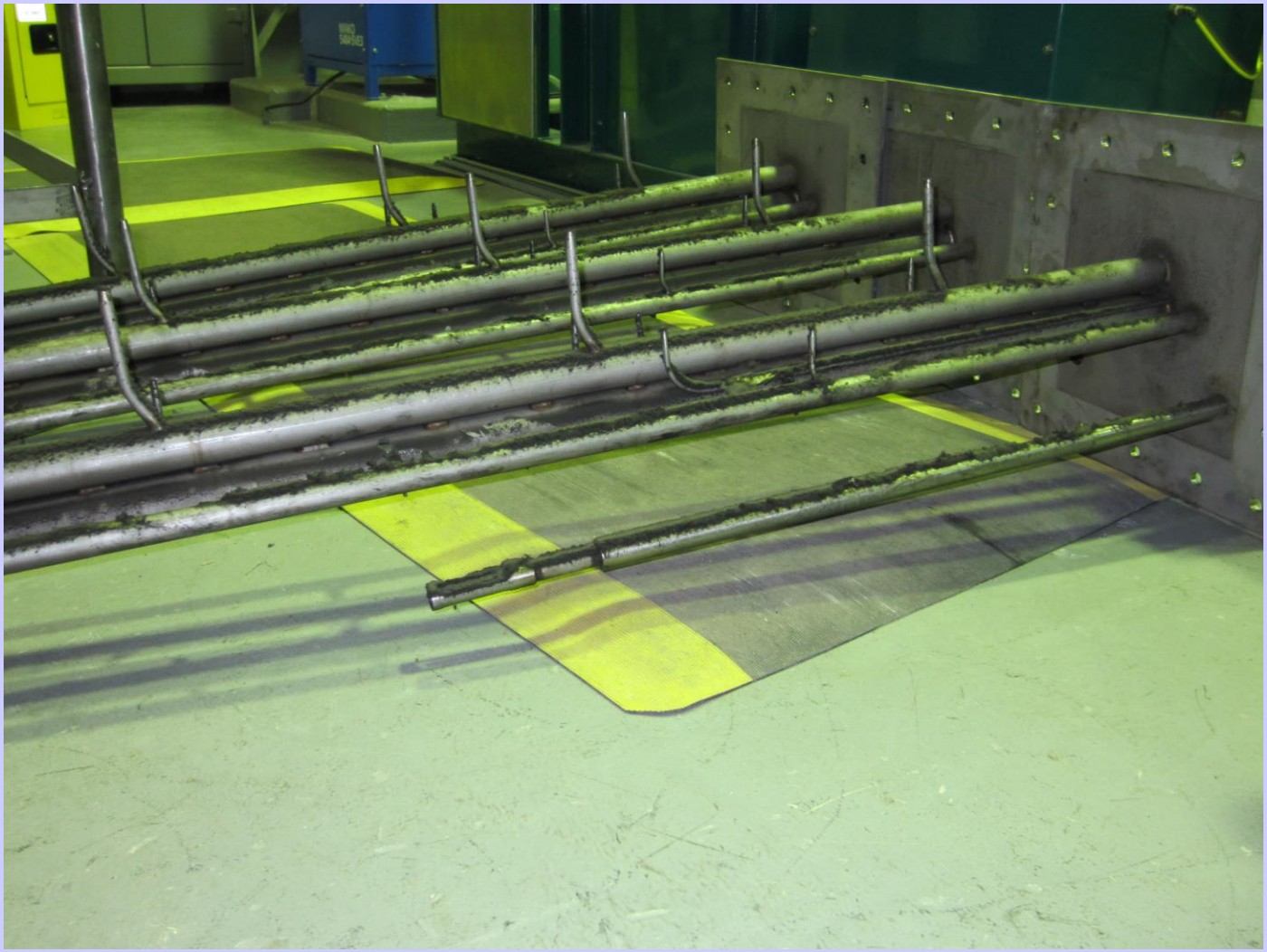
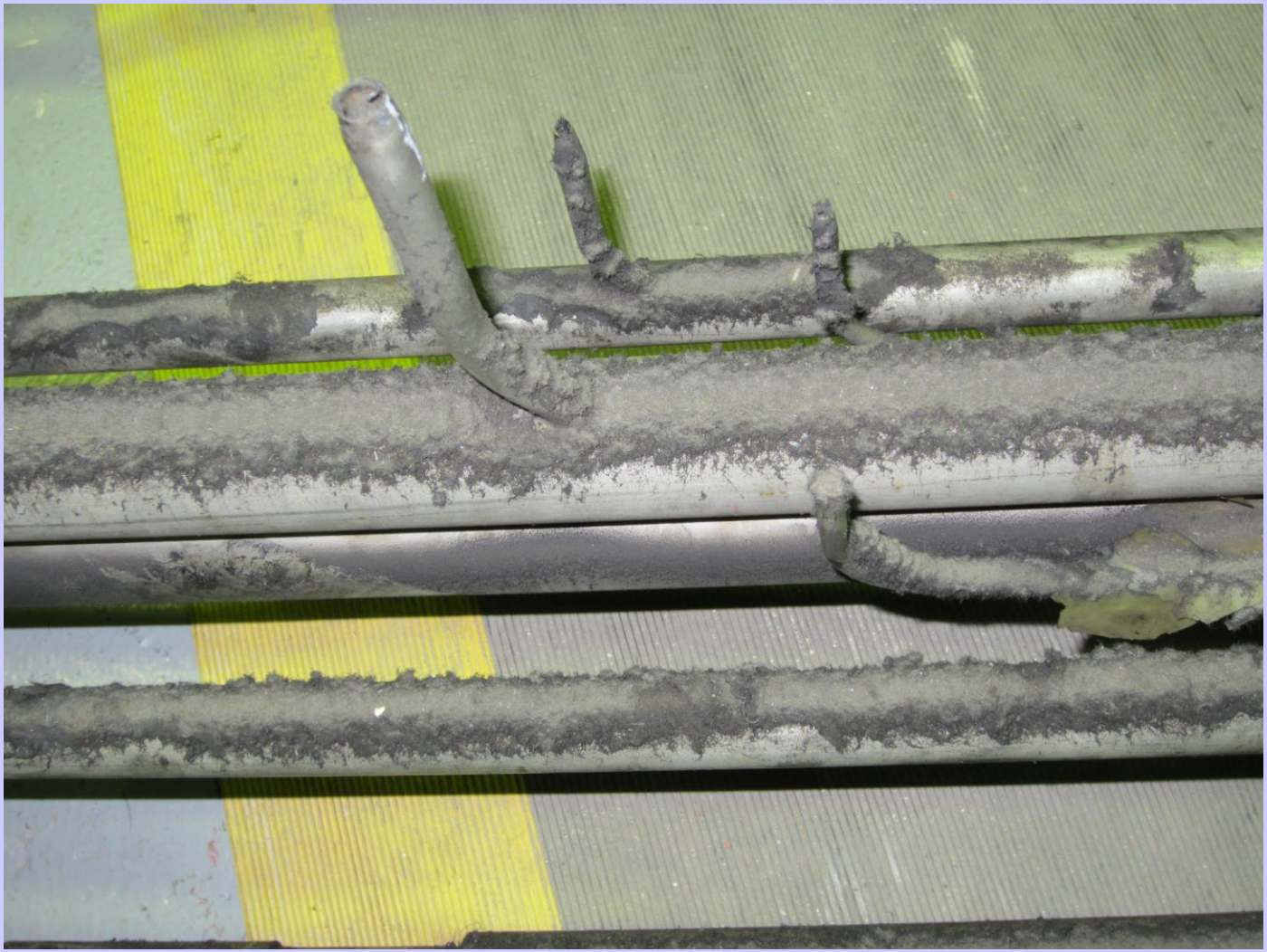


Work Execution



Work Execution



Work Execution

- General Timeline:
  - Chemistry preparations: filter changes, set-up, containment purge (**M 5/13 & W 5/15**)
  - Started Unit Vent Outage (**W 5/15**)
  - Removed Insulation & Heat Trace (**W 5/15**)
  - Removed Isokinetic Nozzles (**R 5/16**)
  - Cleaned Isokinetic Nozzles (**R 5/16 – F 5/17**)
  - Replaced Isokinetic Nozzles, Heat Trace, and Insulation (**F 5/17**)
  - Restored GTRE21A/B to service (**S 5/18**)

Results / Conclusions

- Sample flow was restored to normal band. From 1.33 scfm prior to cleaning (with 17 surveillance test deficiencies), to 1.72 scfm post cleaning (with 1 test deficiency).
- One work item added beyond original plan: Broken stud on blind flange assembly required repair.
- Plan in ADVANCE: Instrument & Calibration, Electrical, Insulation, Welders, Operations, 3 Doors with Dedicated Watch Standers, Health Physics, Radiation Monitor and Ventilation System Engineers, Safety, & Chemistry
- **FAQ: How did they get dirty?**

Results / Conclusions

QUESTIONS???