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SYSTEM ASSESSMENT REPORT

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7. Abstract

This document is a Stack Monitoring and Sampling System Annual System Assessment Report associated with the 296-B-1 stack.

8.

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291-B-1 Stack Monitoring and Sampling System

Annual System Assessment Report

Prepared by T. M. Ridge
B Plant Environmental Engineering

December 1994

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Stack 291-B-1 Sampling and Monitoring System Annual System Assessment Report

I. Scope

B Plant Administration Manual, WHC-CM-7-5, Section 5.30 requires an annual system assessment to evaluate and report the present condition of the sampling and monitoring system associated with Stack 291-B-1 (System Number B97A) at B Plant.

II. Summary Evaluation

The sampling and monitoring system associated with stack 291-B-1 is functional and performing satisfactorily.

III. System Description

A. System Flow Configuration

The B Plant 291-B-1 main stack (Figure 1) exhausts gaseous effluents to the atmosphere from the 221-B Building canyon and cells, the No. 1 Vessel Ventilation System (VVS#1), the 212-B Cask Station cell ventilation system and, to a limited capacity, the 224-B Building. VVS#1 collects offgases from various process tanks in 221-B Building, while the 224-B system maintains a negative pressure in out-of-service, sealed process tanks. Figure 2 shows the general flow of air and exhaust gases through the system and out the 291-B-1 main stack.

Fresh air to the canyon is supplied by ten canyon supply fans (Figure 2), each rated at 2,360 liters/s (5,000 cubic feet per minute (cfm)) and .06 meter (2.35 inches) of static pressure, and driven by a 3,730 Watts (W) (5.0 horsepower (hp)) motor. These supply fans, along with the canyon exhaust fans, establish air flow patterns for contamination control. Normally, two centrifugal exhaust fans operate, each capable of delivering 17,700 liters/s (37,500 cfm) at rated conditions of .29 meter (11.5 inches) of static pressure and 21.1 degrees Celsius (70 degrees Fahrenheit (F)). The fans are driven by 440/480 volt (V), 1175 revolutions per minute (rpm), 74,570 W (100 hp) motors. A steam-turbine-driven fan provides backup exhaust capacity of 17,700 liters/s (37,500 cfm) at 0.4 meter (15.4 inches) of static pressure.

B. Sampling and Monitoring Equipment

The exhaust discharging through 291-B-1 main stack is continuously monitored and sampled. The Stack is 58 meters (190 feet) high with the sampling and monitoring probe assembly located approximately 15.2 meters (50 feet) above the base of the stack (Figure 3). The sampling probes are connected by insulated and heat traced transport lines to the 292-B Instrument Building, which lies just west of the stack and houses the flow monitoring and radiation analysis equipment (Figure 4). Instrument controls, alarms and indicators are located within this structure,

except for the high airborne radiation beacon and system failure bell, which are mounted on the exterior north face of the 292-B Building. Remote alarms and indicators are connected to the Facility Process Monitoring Control System (FPMCS) in the 271-B Building dispatcher's office and monitored 24 hours a day.

The stack sampling and monitoring probe assembly consists of six nozzles for the primary record sampling probe (Figure 5), six nozzles for the secondary sampling probe and two nozzles for the flow monitor. The sampling and monitoring probes were designed for multinozzle isokinetic sampling. The design was based on the average stack velocity determined from velocity profile measurements. The probe assembly was installed in 1983.

The primary record sampling system operates continuously while air is being exhausted from the stack. The system has a switched receptacle linked to exhaust fan operation. A flow switch disrupts power to the receptacle when stack air flow ceases and restores power upon detection of resumed flow. The record sampler extracts its air sample at a rate of .94 liter/s (2.0 cfm). This rate can be manually adjusted by the flow control valve for the record sampling system. Air flow rates through the record filter are sensed, regulated, indicated and totalized in the 292-B Instrument Building. A low sample air flow rate activates an alarm switch that initiates local and remote alarm indicators.

The secondary sampling system operates continuously under all circumstances. It extracts its sample from the stack flow and draws it through a flow splitter. One side of the flow splitter is ported to a backup record filter, while the other side is ported to a continuous airborne beta/gamma radiation monitor (CAM). The sample flow rate in the secondary sampling system is 1.9 liters/s (4.0 cfm), with .94 liter/s (2.0 cfm) each to the backup record sampler and CAM. The backup record sampler flow rate can be adjusted manually using the needle valve on its rotameter, while the CAM flow rate can be manually adjusted at its flow control valve. The air flow through both the backup record filter and CAM is regulated and equipped with a flow rate indicator. Local alarms are provided by the sample system for low sample flow rates. Alarms resulting from radiation analyzer malfunction or low sample flow rate are combined into one general alarm at the remote alarm panel in the dispatcher's office. The sample system has local alarms for high airborne radiation and system failure and a high temperature alarm for CAM circuit protection.

The 291-B-1 main stack flow rate is monitored by a measuring the differential pressure between two pitot tubes located in the flow stream at the 15.2 meters (50 feet) level of the stack. An electronic transmitter located in the 292-B Instrument Building converts this differential pressure measurement to an electrical signal proportional to the flow rate. This proportional signal is then transmitted to the FPMCS in the 271-B Building, which converts the signal into the

corresponding stack flow rate. Flow rates are displayed on the monitor in the 271-B Dispatcher's office. The FPMCS also contains a flow integrator, which totalizes the flow in the stack.

C. Regulations

Stack 291-B-1 is considered a major stack under current regulation standards due to the potential radionuclide emissions. An assessment on Stack 291-B-1 determined that an effective dose equivalent to the maximally exposed individual was greater than 0.1 millirem per year. Therefore, the stack is subject to the sampling and monitoring requirements of 40 CFR 61, Subpart H. "B Plant Comparison with 40 CFR 61, Subpart H, and other Referenced Guidelines for Stack 291-B-1" (WHC-EP-0546) pointed out minor deviations in the sampling and monitoring system that did not meet current regulations and standards. The "Technical Information Package on the 291-B-1" (WHC-SM-WM-ER-307) was submitted in April of 1994 seeking approval for the sampling and monitoring system already in place on the stack. Approval was granted in June of 1994.

D. Procedures

The following is a list of procedures associated with the operation and maintenance of Stack 291-B-1.

Table 1. Procedures for 291-B-1 System

Procedure Number	Title
BO-001-019	Perform Emergency Responses to Alarms in Exhaust Stacks
PSCP-3-002	Continuous Air Monitor
PSCP-7-001	Sample Flow Indicator
PSCP-4-007	Flow Totalizer
PSCP-4-091	Pressure Indicator
PSCP-6-029	Flow Alarm Switch
PSCP-6-085	Flow Transmitter

E. Drawing List

Table 2. Drawing List* for 291-B-1 System

DRAWING NUMBER	TITLE	TYPE
H-2-91208	Generic Stack Beta Record Rack Assembly	General
H-2-92488-1	Generic Stack Sampler/Monitor Modified Monitor Assembly	General
H-2-92488-2	Generic Stack Sampler/Monitor Modified Monitor Assembly	General
H-2-92489	Generic Stack Sampler/Monitor Record Sample Loop Assembly	General
H-2-92490	Generic Stack Sampler/Monitor Sample Extraction Assembly	General
H-2-92501	Generic Stack Beta Record Cabinet Assembly	General
H-2-92502	Generic Stack Beta Record Cabinet Assembly	General
H-2-92520	Generic Stack Beta Record Cabinet Spilt Entry Assembly	General
H-2-94158-1	Elec./Instm./Dwg./ List Site Plan & Details 291-B-1 Sampler/Monitor	Support
H-2-94158-2	Elec./Instm. Plan & Details Dispatcher's Office	Support
H-2-94159	Probe Assembly 291-B-1 Stack Sampler/Monitor	Support
H-2-94161	Elec./Instm. Electrical Diagram 291-B-1 Sampler/monitor	Support
H-2-96550	IEFD B Plant Area Stack Monitors 291-B-1	Essential

* This list is not intended to be inclusive.

IV. System Status

The system status was based on the adequacy of alarms, Component Based Recall System (CBRS), and open workpackages in the Job Control System (JCS).

The alarm system and CBRS were found to be adequately control and maintain the monitoring and sampling system for 291-B-1. At the time of this report there were not any open work packages.

A. Alarm Assessment

The alarm assessment was used to ensure that current alarms provide adequate protection for plant personnel, equipment, and the environment. It was determined that alarms associated with the monitoring and sampling system for Stack 291-B-1 are satisfactory. Please see Attachment 1.

B. Component Based Recall System (CBRS)

The calibration of the 291-B-1 main stack sampling and monitoring instrumentation is tracked using the Component Based Recall System (CBRS) at B Plant. Currently, all stack monitoring instrumentation is on a 6 month calibration cycle. The calibration procedures being used are shown in Section III, Part D, Table 1. The calibrations are performed by B Plant Instrument Maintenance.

C. Job Control System (JCS) Open Work Packages

At this time there are not any open work packages.

V. Items Requiring Action

Items requiring action are activities that will enhance the performance of the system.

A. Near Term Items

Sustain the current condition of the monitoring and sampling system.

B. Long Term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Trends

Stack flow rate is approximately 15,102 liters/s (32,000 cfm) during normal operations. The flow rate and emissions are measured continuously and surveilled at the dispatch office.

The record sample filter paper is exchanged on routine basis and analyzed for total alpha and total beta (Figure 6). The administrative control values (ACV) for total alpha and total beta are 2E-13 and 9E-11, respectively. A composite sample analyzing for ^{90}Sr , ^{137}Cs , and $^{239,249}\text{Pu}$ is done quarterly. The backup record sample and the CAM sample are counted for total alpha and total beta by the Health Physics Organization at B Plant. The Health Physics Organization records the output from the CAM each shift.

Vent and Balance performs a quarterly flow test and a annual efficiency test on the filters.

Below is a table of the routine surveillances performed on the 291-B-1 system.

Table 3. Routine Surveillance of 291-B-1 System

Surveillance	Frequency	Responsibility
Check of local CAM ratemeter	Each shift	Health Physics
Change of CAM filter	Weekly	Health Physics
Change and analysis of record sample filter (Figure 6)	Weekly	Health Physics/ 222S Laboratory
Change of backup sample filter	Weekly	Health Physics
Record sample composite analysis	Quarterly	222-S Laboratory
Stack flow measurement	Quarterly	Vent and Balance
Efficiency test of HEPA Filter System	Annually	Vent and Balance

VII. System Aging, Spare Parts Considerations, and Long Term Maintenance Plan

All components are reliable for at least five years except the vacuum pumps and timers. Spare parts are available. The sampling and monitoring system was approved in June of 1994. Therefore, the long term maintenance plan is to keep the system functional, accurate, cost effective and in compliance with the regulations. Due to the future plans for closing B Plant the sampling and monitoring system will only be up graded if regulator requirements change.

VIII. Checkoff List

The checkoff list is a general overview of the performance of the system.

A. Accessible parts of the entire system or component have been thoroughly walked down at least once in the past 30 days to review current performance, equipment status and condition.

Yes X

No

Comments (exceptions):

B. Are there any conditions which might require limitations different from operating limits as defined in the SDDs and SARs?

Yes

No X

Comments (exceptions):

C. Are there trip settings, set points, interlocks, etc., that should be changed from those currently established?

Yes____

No X

Comments (exceptions):

D. Are there interface areas which have not performed acceptably, which require resolution?

Yes____

No X

Comments (exceptions):

E. Are there temporary plant or procedural conditions which will and should remain in place?

Yes____

No X

Comments (exceptions):

F. Is any retesting or special testing required?

Yes____

No X

Comments (exceptions):

G. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified and are planned actions acceptable?

Yes X

No____

Comments (exceptions):

H. Are all other action items (NCRs, IRs, etc.) properly identified and assigned?

Yes X

No____

Comments (exceptions):

I. Are there any special operating considerations?

Yes____

No X

Comments (exceptions):

J. Are near term spare parts adequate?

Yes X

No

Comments (exceptions):

K. Have any safety issues (radiological, industrial, environmental) been identified that remain unresolved?

Yes

No X

Comments (exceptions):

L. Have all component data been entered into the plant information database?.

Yes X

No

Comments (exceptions):

M. Have applicable inspections been conducted?

Yes X

No

Comments (exceptions):

N. Has cleanliness evaluation been completed?

Yes X

No

Comments (exceptions):

O. Are any issues still unresolved?

Yes

No X

Comments (exceptions):

References

American National Standards Institute, Inc., *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*, ANSI N13.1, 1969, New York, New York.

Environmental Compliance Manual, WHC-CM-7-5, Westinghouse Hanford Company, Richland, Washington.

Environmental Protection Agency, *National Emissions Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*, Title 40 Code of Federal Regulations, Chapter 61, Subpart H, 1989, Washington, D.C.

Beam, T. G., *Technical Information Package on the 291-B-1 Stack*, WHC-SD-WM-ER-307, REV. 0, March 1994, Westinghouse Hanford Company, Richland, Washington.

Peterson, K. A. and R. L. Daubert, *Facility Effluent Monitoring Plan for the B Plant*, WHC-EP-0467, November 1991, Westinghouse Hanford Company, Richland, Washington.

Sewell, R. G., *B Plant Safety Analysis Report*, SD-WM-SAR-013, July 1985, Rockwell Hanford Operations, Richland, Washington.

APPENDIX

Figure 1: Stack 291-B-1 and the 292-B Building

Figure 2: B Plant Main Stack Exhaust Flowsheet

Figure 3: Sampling Probe Port

Figure 4: Monitoring System

Figure 6: 291-B-1 Primary Record Beta Concentration Graph

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SYSTEM ALARM MATRIX - STACK 291-B-1

System Number: B97A
Cognizant Engineer: Tina M. Ridge
Date: November 21, 1994

Alarm Objective: To provide adequate protection for plant personnel, equipment, and the environment.

1. Are the proper alarms and set points established?

Yes X

No

Comments (exceptions): Current alarm set point (ASP) is well below the maximum alarm set point. The ASP of 3,500 cpm does not cause nuisance or false alarms. The lower ASP allows for early detection of problems.

A. Are there any alarms which should be made active or inactive?

Yes

No X

Comments (exceptions):

2. Perform a walkdown of your system, look at the following three items:

A. Are there any overdue calibration stickers on alarm loop instruments?

Yes

No X

Comments (exceptions):

B. Are the alarms adequate to attract attention to alarmed points (alarms on the FPMCS are considered adequate)?

Yes X

No

Comments (exceptions):

C. Are alarms properly labeled? (i.e. OSR, Inactive, Tags legible)

Yes X

No

Comments (exceptions):

3. Questions that are to be answered by Operations personnel:

Operator: L. P. LampmanDate: 11/25/94

- A. Ask if they feel there are any alarms which are unnecessary or are continually alarming causing a nuisance? (if so evaluate this alarm using WHC-CM-5-6 section 5.27)

Yes No X

Comments (exceptions):

- B. Ask operations if they feel there are any areas which need to be alarmed and are not at this time?

Yes No X

Comments (exceptions):

4. Is there any evidence of tampering with alarms or annunciation equipment or instruments that might be intended to defeat or silence an alarm without proper authorization?

Yes No X

Comments (exceptions):

5. Are there any overdue CBRS cards on any system alarm?

Yes No X

Comments (exceptions):

6. Are there any backlog work packages on the system alarms?

Yes No X

Comments (exceptions):

7. Are there any open FAITS items for system alarm?

Yes No X

Comments (exceptions):

8. Are there any alarm responses not covered in a plant operating procedure?

Yes_____

No X

Comments (exceptions):

9. Are there any other issues or alarm status deficiencies that are not described above that would affect process equipment or safety?

Yes_____

No X

Comments (exceptions):

Component Status Report

Date Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Filter Paper Holder
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The primary record sampler is located in the 292 B building and manufactured by BGI Incorporated and requires a 47 mm filter paper (Gelman Sciences). The primary record sampler is used to sample the exhaust from Stack 291-B-1.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection, and change the filter paper. The purpose of the inspection is to ensure the equipment is functional and that there are not obvious problems with the equipment. RCTs are to document and report any defects with the monitoring system. After the filter paper is removed it is taken to 222 S Lab for analysis. 222 S Lab allows the sample to decay for seven days and then the filter paper is counted for total alpha and total beta. On a quarterly basis the filter papers are composited and analyzed for individual isotopes (^{241}Am , ^{90}Sr , $^{239,240}\text{Pu}$, and ^{137}Cs). This data is then placed in the Automated Bar Coding of Air Samples at Hanford (ABCASH) database. See Figure 6.

III. Component Aging and Spare Parts

The record sampler has been in place since 1984. It is anticipated that the record sampler will be functional for the lifetime of the current sampling system. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items

Near-term Items

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No _____

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No _____

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No _____

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No _____

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Flow Totalizer
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow totalizer is located in the 292 B building and manufactured by Rockwell (model MR-9). The flow totalizer is rated at 8.92 m³/hr at 34.5 kPa (5 psi) and compensation for temperature occurs at 15.6 °C (60 °F). The flow totalizer records the flow continuously for the primary record sampler associated with Stack 291-B-1.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with the monitoring system. RCTs are to document and report any defects.

Instrument technicians calibrate the flow totalizer every six months.

III. Component Aging and Spare Parts

The current flow totalizer was installed in 1993. Estimated life of a flow totalizer is 5 years. Spares for the flow totalizer is considered adequate.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Flowmeter
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flowmeter is located in the 292 B Building and manufactured by Dwyer (model RMC). The flowmeter is rated at 241 kPa (35 psi) and 54.4 °C (130 °F). Accuracy of the flowmeter is 2% of full scale. Flowrate through the flowmeter is maintained at .94 liter/s (2 cfm).

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with monitoring system. RCTs are to document and report any defects with the monitoring system.

Instrument technicians calibrate the flowmeter every six months.

III. Component Aging and Spare Parts

The reliability of the flowmeter is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Flow Switch
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow switch is located in 292 B building and manufactured by Chem-Tech (Model 500-316-BP). At 103 kPa (15 psi) the flowrate can be between 9.44E-2 liter/s (0.2 scf/min) and 21.2 liter/s (35 scf/min) and 21.2 liters/s (45 cfm) at 414 k Pa (60 psi).

II. Trends

Radiological Control Technicians (RCT) perform a weekly alarm test. When the sample flow is eliminated the system alarms at the alarm panel board, beacon alarm is activated (on the exterior of the 292 B building) and an alarm is activated at the dispatch office. RCTs are to confirm that the alarm on the panel board and the beacon alarm are functioning properly. RCTs are to report any failed alarms.

Instrument technicians check the flow switch once every six months by lowering the flow through the flowmeter below 0.71 liter/s (1.5 cfm). The instrument technicians ensure that the low flow alarm on the panel board, beacon alarm, and the dispatch alarm were activated when the flow was decreased.

III. Component Aging and Spare Parts

The reliability of the flow switch is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items

Near-term Items

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Flow Control Valve
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow control valve is located in the 292 B building and manufactured by Eberline (model 10552-C02-RAP-IR). Vendor information did not provide information on operating ranges or specifications.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with monitoring system. RCTs are to document and report any defects with the monitoring system.

Instrument technicians perform a semi-annual functional test on the flow control valve. This test is accomplished by adjusting the flow until the low flow alarm is activated.

III. Component Aging and Spare Parts

The reliability of the flow control valve is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Timer
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The timer is located in the 292 B building and manufactured by Cramer (model 10083). The timer has an accuracy of $\pm 1\%$ and readable to tenths of an hour.

II. Trends

Instrument technicians perform a monthly functional check on the timer.

III. Component Aging and Spare Parts

A timer will last from 6 months up to 1 year. Spare are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Primary Record Sampler
Vacuum Pump
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The vacuum pump is located in the 292 B building and manufactured by GAST (model 0823). The vacuum pump is rated at 373 Watts (1/2 hp), capacity of 3.4 liters/s (7.2 cfm) at 0 kPa (0" Hg), and 1,725 rpm.

II. Trends

Pumps are replaced on an annual basis.

III. Component Aging and Spare Parts

Pumps used on the 291-B-1 system are replaced yearly. Spare pumps are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Backup Record Sampler
Filter Paper Holder
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The backup record sampler is located in the 292 B building and manufactured by BGI Incorporated and requires a 47 mm filter paper (Gelman Sciences). The backup record sampler is used to sample the exhaust from Stack 291-B-1.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection, and change the filter paper. The purpose of the inspection is to ensure the equipment is functional and that there are not obvious problems with the equipment. RCTs are to document and report any defects with the monitoring system. After the filter paper is removed it is maintained by B Plant's Health Physics Organization until the primary record sample has been validated. The sample is discarded when the validation is complete.

III. Component Aging and Spare Parts

The record sampler has been in place since 1984. It is anticipated that the record sampler will be functional for the lifetime of the current sampling system. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items

Near-term Items

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Backup Record Sampler
Flowmeter
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow meter is located in the 292 B Building and manufactured by Dwyer (model RMC). The flow meter is rated at 241 kPa (35 psi) and 54.4 °C (130 °F). Accuracy of the flowmeter is 2% of full scale. Flow rate through the flowmeter is maintained at .94 liter/s (2 cfm).

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with monitoring system. RCTs are to document and report any defects with the monitoring system. The flowmeter is calibrated every six months.

III. Component Aging and Spare Parts

The reliability of the flowmeter is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Backup Record Sampler
Flow Switch
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow switch is located in 292 B building and manufactured by Chem-Tech (Model 500-316-BP). At 103 kPa (15 psi) the flowrate can be between 9.44E-2 liter/s (0.2 scf/min) and 16.5 liters/s (35 scf/min) and 21.2 liters/s (45 cfm) at 414 kPa (60 psi).

II. Trends

Radiological Control Technicians (RCT) perform a weekly alarm test. When the sample flow is eliminated the system alarms at the alarm panel board, beacon alarm is activated (on the exterior of the 292 B building) and an alarm is activated at the dispatch office. RCTs are to confirm that the alarm on the panel board and the beacon alarm are functioning properly. However, the RCTs are not required to ensure that the alarm was activated at the dispatch office. RCTs are to report any failed alarms.

Instrument technicians check the flow switch once every six months by lowering the flow through the flowmeter below .71 liter/s (1.5 cfm). The instrument technicians ensure that the low flow alarm on the panel board, beacon alarm, and the dispatch alarm were activated when the flow was decreased.

III. Component Aging and Spare Parts

The reliability of the flow switch is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No _____

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No _____

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No _____

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No _____

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Backup Record Sampler
Flow Control Valve
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow control valve is located in the 292 B building and manufactured by Eberline (model 10552-C02-RAP-IR). Vendor information did not provide information on operating ranges or specifications.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with monitoring system. RCTs are to document and report any defects with the monitoring system.

Instrument technicians perform a semi-annual functional test on the flow control valve. This test is accomplished by adjusting the flow until the low flow alarm is activated.

III. Component Aging and Spare Parts

The reliability of the flow control valve is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Backup Record Sampler
Vacuum Pump
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The vacuum pump is located in the 292 B building and manufactured by GAST (model 0823). The vacuum pump is rated at 373 Watt (1/2 hp), capacity of 3.4 liters/s (7.2 cfm) at 0 kPa (0" Hg), and 1,725 rpm.

II. Trends

Pumps are replaced on an annual basis.

III. Component Aging and Spare Parts

Pumps used on the 291-B-1 system are replaced each year. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Beta/Gamma Radiation Monitor
Continuous Air Monitor (CAM)
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The Continuous Air Monitor (CAM) is located in 292 B building and manufactured by Eberline (model AMS-3 Beta Gamma). The pancake G-M tube detector is 4.4 centimeter diameter (1-3/4" diameter) with 1.4 to 2.0 mg/cm² mica window with a log scale range of 10-100K cpm range. Air flow is maintained at .94 liter/s (2 cfm).

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection, and change the filter paper. The purpose of the inspection is to ensure the equipment is functional and that there are not obvious problems with the equipment. After the filter paper is removed it is maintained by B Plant's Health Physics Organization until the primary record sample has been validated. The sample is discarded when the validation is complete.

Instrument technicians perform a monthly source check on the CAM. The technicians compare the level on the CAM to the level on at the dispatch office. Both numbers are recorded and reviewed by the cognizant engineer.

III. Component Aging and Spare Parts

The CAM can fail for a variety of reasons varying in degree of seriousness. A CAM can be used for many years before it needs to be replaced. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items

Near-term Items

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes X

No

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X

No

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X

No

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X

No

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Beta/Gamma Radiation Monitor
Flow Switch
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow switch is located in 292 B building and manufactured by Chem-Tech (Model 500-316-BP). At 103 kPa (15 psi) the flowrate can be between 9.44E-2 liter/s (0.2 scf/min) and 16.5 liters/s (35 scf/min) and 21.2 liters/s (45 cfm) at 414 kPa (60psi).

II. Trends

Radiological Control Technicians (RCT) perform a weekly alarm test. When the sample flow is eliminated the system alarms at the alarm panel board, beacon alarm is activated (on the exterior of the 292 B building) and an alarm is activated at the dispatch office. RCTs are to confirm that the alarm on the panel board and the beacon alarm are functioning properly. However, the RCTs are not required to ensure that the alarm was activated at the dispatch office. RCTs are to report any failed alarms.

Instrument technicians check the flow switch once every six months by lowering the flow through the flowmeter below .71 liter/s (1.5 cfm). The instrument technicians ensure that the low flow alarm on the panel board, beacon alarm, and the dispatch alarm were activated when the flow was decreased.

III. Component Aging and Spare Parts

The reliability of the flow switch is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items

Near-term Items

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes_____

No_____

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes X_____

No_____

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes X_____

No_____

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes X_____

No_____

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Beta/Gamma Radiation Monitor
Flow Control Valve
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The flow control valve is located in the 292 B building and manufactured by Eberline (model 10552-C02-RAP-IR). Vendor information did not provide information on operating ranges or specifications.

II. Trends

Radiological Control Technicians (RCT) perform a weekly overall inspection looking for obvious problems with monitoring system. RCTs are to document and report any defects with the monitoring system.

Instrument technicians perform a semi-annual functional test on the flow control valve. This test is accomplished by adjusting the flow until the low flow alarm is activated.

III. Component Aging and Spare Parts

The reliability of the flow control valve is considered good with a lifetime expectancy of 5 years plus. Spares are available.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):

Component Status Report

Dated Reported: November 21, 1994
System: B97A - Stack 291-B-1 Stack Monitoring System
Component: Beta/Gamma Radiation Monitor
Vacuum Pump
Cognizant Engineer(s): R. D. Weissenfels (December 1992 - September 1994)
T. M. Ridge (September 1994 - Present)
Cognizant Manager: D. L. Halgren (October 1992 - November 1994)
D. W. Wilson (November 1994 - Present)

I. Summary of Component Status

The vacuum pump is located in the 292 B building and manufactured by GAST (model 0823). The vacuum pump is rated at 373 Watt (1/2 hp), capacity of 3.4 liters/s (7.2 cfm) at 0 kPa (0" Hg), and 1,725 rpm.

II. Trends

Pumps are replaced on an annual basis.

III. Component Aging and Spare Parts

Pumps used on the 291-B-1 system are replaced each year.

IV. Conclusions

The current monitoring system is in good condition and has been approved by Washington Department of Health. The only reason to modify the system would be if the regulations were to change drastically.

V. Action Items**Near-term Items**

Sustain the current condition of the monitoring and sampling system.

Long-term Items

Ensure the current monitoring and sampling system is in compliance with all regulations.

VI. Checkoff List

- A. Are the current plant corrective maintenance, preventive maintenance, and calibration database items all properly identified, and are planned action acceptable?

Yes XNo

Comments (exceptions):

- B. Are all other action items (IR, NCR, etc.) properly identified and assigned?

Yes XNo

Comments (exceptions):

- C. Are near-term spare parts adequate?

Yes XNo

Comments (exceptions):

- D. Are trend analysis data acceptable for continued operation?

Yes XNo

Comments (exceptions):