Department of Energy
Washington, DC 20585

July 10, 2009

MEMORANDUM FOR DISTRIBUTION

THROUGH: GLENN S. PODONSKY
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FROM: ANDREW C. LAWRENCE
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SUBJECT: Concurrence on Three Actions Completed to Address Increased High Efficiency Particulate Air Filter Rejection Rates

The Department of Energy's (DOE) *Plan of Action to Address Increased High Efficiency Particulate Air (HEPA) Filter Rejection Rates* (Plan) was submitted to the Defense Nuclear Facilities Safety Board (DNFSB) on July 23, 2008. The Plan was developed in response to the March 17, 2008, DNFSB letter regarding its concerns on the increased contribution of manufacturing defects to the rejection rates of filters tested at the Filter Test Facility (FTF).

In response to the DNFSB letter, a review team comprised of Federal and contractor employees experienced in HEPA filter testing, procurement, quality assurance (QA), engineering, and operations, drafted a plan of action to address the increase in rejection rates.

Action 1.4 of the Plan required DOE to review the flow of information between filter manufacturers, the FTF, and DOE and site contractor personnel to determine if quality-related issues emerging from HEPA filter inspection and testing can be identified and communicated in a more timely manner.

Actions 3.1 and 3.2 of the Plan required DOE to conduct a site survey to: (1) document protocols for testing non-safety related HEPA filters used in facility ventilation systems for confinement of radioactive particles as defined in DOE-STD-3020, *Specification for HEPA Filters Used by DOE Contractors,* and (2) to identify the technical basis for any tailored filter testing program being used. All survey respondents indicated that a tailored QA testing program is <u>not</u> being used and that 100 percent of the subject filters are being sent to the FTF for inspection and testing, or that a program is being implemented to do so.

The enclosed reports document the results of the above actions and will be submitted to the DNFSB indicating completion of the specific action items of the plan.

If you have any questions, you may contact me at (202) 586-5680 or your staff may contact Subir Sen at (301) 903-6571 or subir.sen@hq.doe.gov .

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RECOMMENDATIONS FOR IMPROVING THE REPORTING OF HEPA FILTER INSPECTION AND TEST DATA

PLAN OF ACTION TO ADDRESS INCREASED HEPA FILTER REJECTION RATES
ACTION 1.4

Department of Energy
Office of Health, Safety and Security

July 2009

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EXECUTIVE SUMMARY

On March 17, 2008, the Department of Energy's (DOE) Office of Health, Safety and Security (HSS) was issued a letter by the Defense Nuclear Facilities Safety Board (DNFSB) requesting actions to address the increased high-efficiency particulate air (HEPA) filter rejection rates as reported in the FY 2007 semi-annual reports issued by the HSS Office of Corporate Safety Programs. These semi-annual reports provided the results of HEPA filter inspection and testing performed at the Filter Test Facility (FTF) and recommended further actions by the DOE site contractors to assess and report on the efficacy of the HEPA filter manufacturers' quality assurance programs.

In response to the DNFSB letter, a plan of action was developed to address the increase in rejection rates. A team was formed comprised of Federal and contractor employees with experience and expertise in HEPA filter testing, procurement, quality assurance, engineering, and operations. The team reviewed the flow of information between and among interested stakeholders including, the FTF, and DOE and site contractor personnel (e.g., quality assurance, engineering and procurement) to evaluate the HEPA filter data reporting processes to improve the flow of information to the stakeholders from HEPA filter inspections and testing. The objective of the review was to develop a list of recommendations to improve flow of information between and among the stakeholders and in certain instances the filter manufacturers, and to strengthen the causal analysis and corrective action processes to improve HEPA filter quality.

The recommendations focus on the FTF Test and Inspection Report and include the following:

- Maintain a list, through DOE, of complex-wide HEPA filter points of contact
- Share results of DOE site contractors' periodic supplier quality assurance evaluations and source verifications of the filter manufacturers among DOE stakeholders
- Share contractors' receipt inspection nonconformance reports related to filters inspected and tested at the FTF among DOE stakeholders
- Specify in site contractor's purchase orders that manufacturers provide nonconformance reports to the site contractors for filters rejected by the FTF
- Modify the FTF process for reporting the results of the HEPA filter inspection and testing
- Modify the FTF filter rejection label and the HSS monthly and semi-annual reports to incorporate rejection codes recommended in this report

Implementing the above recommendations will significantly improve the exchange of HEPA filter inspection and testing information between and among interested stakeholders. This will enable DOE and the site contractors to institute consistent reporting of HEPA filter quality assurance related information to facilitate analysis and trending in order to take timely and appropriate corrective actions.

1.0 INTRODUCTION

1.1 *Background*

On March 17, 2008, the Department of Energy's (DOE) Office of Health, Safety and Security (HSS) was issued a letter by the Defense Nuclear Facilities Safety Board (DNFSB) requesting actions to address the increased high-efficiency particulate air (HEPA) filter rejection rates as reported in the FY 2007 semi-annual reports issued by the HSS Office of Corporate Safety Programs. These semi-annual reports provided the results of HEPA filter inspection and testing performed at the Filter Test Facility (FTF) and recommended further actions by the DOE site contractors to assess and report on the efficacy of the HEPA filter manufacturers' quality assurance programs.

In response to the DNFSB letter, a review team comprised of Federal and contractor employees experienced in HEPA filter testing, procurement, quality assurance (QA), engineering, and operations, drafted a plan of action to address the increase in rejection rates. In July 2008, the *Plan of Action to Address Increased HEPA Filter Rejection Rates* was submitted to the DNFSB. One of the actions in the plan required a review of the flow of information between and among interested stakeholders, including, the FTF, site contractor personnel (e.g., QA, engineering and procurement) and DOE (Headquarter and Field offices) to determine if quality related issues could be identified and communicated among these stakeholders, and in certain instances the filter manufacturers in a timely manner.

Several weaknesses in communication were identified that impacted taking appropriate corrective actions. For example: (1) FTF test reports were routinely sent to the contractor purchasing organization; however, this information was typically not distributed to the site QA personnel responsible for supplier quality; (2) DOE Field Offices and site contractor personnel were not receiving monthly FTF reports that would provide more timely and detailed indication of potential quality problems; (3) semi-annual reports on FTF testing were typically not distributed to site QA organizations; (4) site contractors were not receiving sufficiently detailed descriptions of causes for filter rejections; (5) site contractors were not generating nonconformance reports (NCRs) for filters rejected by FTF as rejected filters are not sent to the site; (6) FTF was not receiving site contractor NCRs resulting from receipt inspections; and (7) site contractors' periodic supplier quality audit results of the HEPA filter manufacturers were not shared with other DOE site contractors. The plan of action therefore called for a review to improve communication of HEPA filter inspection and test data between and among interested stakeholders.

1.2 *Review Purpose, Scope, and Objectives*

The purpose of the review was to evaluate the HEPA filter data reporting processes to improve and accelerate the flow of information from HEPA filter testing and inspections. The scope of this review included information related to QA inspection and testing of

HEPA filters at the FTF, reporting of the HEPA filter rejection rates and associated trending, and also inspections and QA related actions taken by site contractors. The objective of the review was to develop a list of recommendations that will improve flow of information and strengthen the corrective action and causal analysis processes to enhance HEPA filter quality and thereby reduce the rejection rate for filters from inspection and testing at the FTF.

2.0 REVIEW METHODS

2.1 *APPROACH*

The review focused on the adequacy of specific data collection and dissemination from FTF filter inspection and tests and other inspections conducted by site contractors. The current reporting processes were examined, specifically in light of the weaknesses highlighted in Section 1.1. The review also considered specific data/information submittal requirements specified in DOE-STD-3020-2005, *Specification for HEPA Filters Used by DOE Contractors,* and DOE-STD-3025-2007, *Quality Assurance Inspection and Testing of HEPA Filters.*

The review included examining the distribution of information (was it getting to the right person in a timely fashion?) and the data content to ensure the right data and an appropriate level of detail were being captured. The interaction among various stakeholders (i.e., DOE, site contractors, manufacturers, and FTF) was examined to assure that: (1) there were clear requirements for monitoring manufacturer's quality performance and corrective actions related to manufacturing defects; (2) QA-related information was shared among site contractors and (3) the results of site receipt inspection of filters were shared with the FTF. The reporting processes were then evaluated for improvements and several recommendations were developed.

2.2 Reference Documents

The following documents were used to determine the basic requirements for the review:

- *Plan of Action to Address Increased HEPA Filter Rejection Rates*, July 2008
- DOE-STD-3020-2005, *Specification for HEPA Filters Used by DOE Contractors*
- DOE-STD-3025-2007, *Quality Assurance Inspection and Testing of HEPA Filters*

3.0 REVIEW RESULTS

3.1 *Recommendations*

The evaluation performed pursuant to Section 2.1 resulted in recommending the following six specific improvements to the current reporting processes. The focus of the recommendations is to institute consistent reporting of FTF and other inspection and test results to facilitate analysis and trending as well as taking timely and appropriate corrective actions.

3.1.1 *Maintain a list of DOE complex-wide High Efficiency Particulate Air filter points of contact*

One of the DOE plans of action (Action 1.3) specified that HSS establish a list of DOE and contractor QA points of contact (POC) for receiving HEPA filter-related data/information, such as the FTF monthly and semi-annual reports, to enable appropriate and timely response to quality issues. The QA POC list has been developed and it is recommended that HSS maintain the list and circulate it annually to obtain updates from the Program Secretarial Offices (PSOs) and Field Elements.

3.1.2 *Share results of site contractors' periodic supplier quality assurance evaluations and supplier source verifications of filter manufacturers*

It is recommended that the site contractors through the Field Elements share information on the supplier (filter manufacturer) QA audit/evaluations and supplier source verifications performed by the site contractors. As these QA audits and verifications of the HEPA filter manufacturers are performed, the site contractors, a copy of the results should be provided to HSS for distribution to the HEPA filter QA POCs. Sharing this information may eliminate some duplication of effort with QA evaluations and will notify other sites of potential issues with the manufacturers' QA programs.

3.1.3 *Share site contractors' receipt inspection nonconformance reports related to Filter Test Facility testing*

It is recommended that the site contractors through the Field Elements provide HSS with a copy of contractor on-site HEPA filter receipt inspection nonconformance reports (NCRs) related to the inspection and test activities performed by the FTF. HSS will then forward the NCRs to the FTF for action. Also, Field Elements will specify that the site contractors should categorize their receipt inspection rejections using the same rejection codes as indicated in Appendix A, Page 4 of 4. This will allow HSS to monitor post FTF inspection and testing DOE-wide. This data may also be valuable in evaluating FTF inspection and testing protocols.

3.1.4 *Specify in site contractor's purchase orders that manufacturers provide nonconformance reports for filters rejected by the Filter Test Facility*

It is recommended that the site contractors specify in their purchase orders that filter manufacturers issue NCRs for filters rejected by FTF. Additionally, the contractor's purchase orders should specify that the manufacturer maintain a customer specific rejection rate by the same rejection codes used in the FTF inspection and test report. This should also include filters rejected from contractors' receipt inspections and reported to the manufacturer. As an ASME NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications,* qualified supplier, the manufacturer should already be performing this activity in accordance with its approved QA program. The contractor's purchase

orders should also specify that the supplier provide information related to the disposition of filters returned (i.e., rejected) by the FTF, including corrective actions taken, when requested. This will ensure that the manufacturers are taking appropriate action to supply NCRs for filter rejections, and DOE will have documented evidence that appropriate corrective actions are occurring. The contractors should request such documentation when audits are conducted or on an as needed basis to ascertain the effectiveness of the corrective actions taken by the manufacturers as well as the effectiveness of the filter manufacturer's QA program.

3.1.5 *Modify the Filter Test Facility process for reporting the results of High Efficiency Particulate Air filter inspections and tests*

Critical to the trending of HEPA filter rejections is the monitoring of the HEPA filter quality by the FTF. The FTF conducts quality inspections and tests for each HEPA filter and records the results (including details on rejections) in the FTF inspection and test report. In addition to providing results and details of rejections for each filter, the FTF inspection and test report provides the source data for the DOE monthly and semi-annual reports.

It is recommended that DOE revise the FTF format for reporting the results of the HEPA filter inspections and tests as follows: (1) the FTF inspection and test report will be modified as shown in Appendix A, Page 1 of 1 to report results for each filter inspection and test; (2) the FTF will include a separate sheet (see Appendix A, Page 3 of 3) to record the rejection code and supplemental description to document the details of the filter rejection and, (3) the FTF should use a standardized set of rejection codes (see Appendix A, Page 4 of 4). The FTF will use the inspection checklist (see Appendix A, Page 2 of 2) to document the inspection for the specific purchase order but will not be required for each filter. The distribution of the FTF inspection and test report will remain with the site contractor procurement contact.

3.1.6 *Modify the Filter Test Facility filter rejection label and the HSS monthly and semi-annual reports to incorporate recommended rejection codes*

It is recommended that the FTF modify the rejection codes generated in its monthly and semi-annual reports to match the rejection codes identified in Appendix A, Page 4 of 4 (see attached Inspection and Test Report). This will ensure that the contractors receive sufficiently detailed descriptions of causes for filters rejected from FTF testing. It is expected that the contractors will also use these rejection codes during their receipt inspection for consistency from site to site. See Appendix B for an example of the use of the rejection codes for a FTF generated monthly report.

4.0 CONCLUSIONS

The team made six recommendations resulting from evaluation of the reports and data required by the DOE HEPA filter Standards. Implementing the recommendations will significantly improve the exchange of FTF inspection and testing information. This will enable DOE to institute consistent timely reporting of HEPA filter QA related information to facilitate analysis and trending in order to take timely and appropriate corrective actions.

Recommendation	Responsibility
3.1.1 Maintain a list, of DOE complex-wide HEPA filter points of contact	HSS
3.1.2 Share results of site contractors' periodic supplier QA evaluations and supplier source verifications of the filter manufacturers	Site contractors/Field Elements/HSS
3.1.3 Share site contractors' receipt inspection NCRs related to FTF testing	Site contractor/Field Elements/HSS
3.1.4 Specify in site contractor's purchase orders that manufacturers provide NCRs for filters rejected by the FTF	Site contractors
3.1.5 Modify the FTF process for reporting the results of HEPA filter inspections and tests	FTF
3.1.6 Modify the FTF filter rejection label and the HSS monthly and semi-annual reports to incorporate recommended rejection codes	FTF

Appendix A

FTF Inspection and Test Report (Page 1 of 4)

PAGE 1 OF 1

CUSTOMER Fluor Hanford	**T E S T C R I T E R I A** DOP PENETRATION	NUMBER ORDERED 7	DATE RECEIVED 10 Apr 08
PURCHASE ORDER NO. 00034833 LINE No. ☐ REPLACEMENTS: Yes ☐ No☐	.03 % @ RATED FLOW / .03 % @ 20 % RATED FLOW RESISTANCE 1.3 IN., W.G. @ 100 % RATED FLOW	NUMBER RECEIVED 7	DATE TESTED 22 Apr 08
FILTER MODEL NUMBER 0-007-D-43-05-NU-51-23-CC-DU5	SPECIFICATION HNF-S-0552 Rev. 5 & Data Sheet	NUMBER ACCEPT 4	DATE SHIPPED 22 Apr 08
MANUFACTURER Flanders	**T E S T C O N D I T I O N S**	***R E J E C T I O N S U M M A R Y***	

FILTER DESCRIPTION		TEMPERATURE	TEST FLOW (ACFM)	PENETRATION	TRANS/PACKAGING DAMAGE	LABELING
Mtl 12x12x5.88 GRDX2 FS Up		68° F	125/25	**1**	**1**	
PO reviewed by JKF/DWC/JAS	RATED FLOW 125 CFM	Barometer 757 mm hg.	Humidity 50% RH	RESISTANCE	PO/SPEC	FILTER DEFECT **1**

ITEM No.	FILTER SERIAL NUMBER	VISUAL INSPECTION		TEST RESULTS			DISPOSITION			
				RESISTANCE	% PENETRATION		ACCEPT	ACCEPT W/WAIVER	REJECT	PRIMARY REJECTION CODE
		Pass	Fail		@ 100% FLOW	@ 20% FLOW				
1	**133457**	☒	☐	**1.0**	**0.002**	**0.003**	☒	☐	☐	**-**
2	**133458**	☒	☐	**1.0**	**0.002**	**0.003**	☒	☐	☐	**-**
3	**133459**	☒	☐	**1.1**	**0.004**	**0.005**	☒	☐	☐	**-**
4	**133460**	☐	☒	**1.1**	**0.005**	**0.007**	☐	☒	☐	**-**
5	**133461**	☒	☐	**0.9**	**0.005**	**0.006**	☐	☐	☒	**P**
6	**133462**	☐	☒	**N/A**	**N/A**	**N/A**	☐	☐	☒	**F**
7	**133463**	☐	☒	**N/A**	**N/A**	**N/A**	☐	☐	☒	**T**
8		☐	☐				☐	☐	☐	**-**
9		☐	☐				☐	☐	☐	**-**
10		☐	☐				☐	☐	☐	**-**

DISTRIBUTION

Marge A Palfrey e-mailed 22 Apr 08

Tested BY:

Approved BY:

Appendix A

FTF Inspection and Test Report (Page 2 of 4)

Inspection Check List

Purchaser: P.O.#: Date:

Specific Reference for Acceptance Criteria: _____

RECEIVING INSPECTION

	Satisfactory	Unsatisfactory	N/A
Number of Filters Per Shipping Papers	☐	☐	☐
Filters Received Upright (pleats vertical)	☐	☐	☐
Cartons/Filters Undamaged	☐	☐	☐
Crates/Pallets Undamaged	☐	☐	☐

\9Characteristics As Specified In Purchase Order or Specifications:

		Satisfactory	Unsatisfactory	N/A
Number of Filters		☐	☐	☐
Frame Material		☐	☐	☐
Frame Construction		☐	☐	☐
Gaskets:	**Type**	☐	☐	☐
	Location/Size	☐	☐	☐
	Construction	☐	☐	☐
Capacity		☐	☐	☐
UL-586 Label		☐	☐	☐
Faceguards		☐	☐	☐
Separators		☐	☐	☐
Required Labels/Marking/Identification		☐	☐	☐
Exposed Edges of Frame Sealed		☐	☐	☐
Frame Edges/Faces Free of Splinters/Rough Edges		☐	☐	☐
Gaskets Secure and Undamaged		☐	☐	☐
Fluid Seal Gasket Undamaged		☐	☐	☐
No Damage to Filter Media		☐	☐	☐
Filter Dimensions		☐	☐	☐
Squareness of Frame		☐	☐	☐
Hidden Shipping Damage		☐	☐	☐
Filter Pack Tightness		☐	☐	☐
Filter Workmanship		☐	☐	☐
Other:		☐	☐	☐

*Comments: *Add description of individual filter rejections*

Inspected by: Name _____

Approved by: Name _____

Appendix A

FTF Inspection and Test Report (Page 3 of 4)

FTF HEPA Test/Inspection Comment Form

Part 1: Reference Information

P.O. Number	P.O. Revision	P.O. Line	Specification Number	Spec. Revision	Other:
34833	0	1	HNF-S-0552	5	PO Data Sheet

Part II: Initial Receipt Inspection for Carrier Damage

Carrier Damage Noted?	Yes ☐	No ☒	Picture Available?	Yes ☐	No ☐	N/A ☒

If yes, describe type and extent of damage Below:
N/A

Part III: Purchase Order /Specification Compliance Review

Is quantity of filters received consistent with purchase order?	Yes ☒ No ☐ N/A☐	
Are filter attributes (material, size, construction, etc.) consistent with Purchase Order?	Yes ☒ No ☐ N/A☐	
Are Buyer-specified (special) tests performed as required per the Purchase Order?	Yes ☒ No ☐ N/A☐	
Is Buyer-specified (special) labeling applied as required per the Purchase Order?	Yes ☒ No ☐ N/A☐	
Is Buyer-specified documentation provided with the shipment?	Yes ☒ No ☐ N/A☐	
Other: N/A	Yes ☐ No ☐ N/A☒	

Part IV: Detailed Inspection/Test Report and FTF

Item #	Serial Number	(Primary) Rejection Code		(Secondary/Other) Defect/Deficiencies		FTF Inspection/Test Comments:	Inspector Initials	Photo Available
		Type	Class	Type	Class	Note: *Unlock form and copy additional rows as necessary. Ensure all data entries are performed in "Locked" mode.*		
4	133460	-	-				-	-
				F	3	Small dent located on side of filter case . Affected area is less than 3/4 inch in diamter approxiately 1/32 inch deep. It appears the filter was bumped againist a sharp corner/ object during handling. The dent is located near the sealing face and is unlikely to have impacted the filter pack. Per J. Jones E-mail dated 10/18/08, filter buyer has requested a rejection waiver and has accepted the filter as-is. Rejection Waiver is on file.	J.M.	Yes
5	133461	F	10			Two small gouges in gel seal on upstream side. 1/2" and 3/4" on each side of corner.	J.F.	Yes
				-	-		-	-
6	133462	F	11			Frame channel is not adequately filled with sealant to assure proper seal during installation. Sealant on one edge of the channel is less than 1/8 inch deep.	D.C.	Yes
				L	3	Lower corner of Filter label is torn. Portion of label showing UL-586 compliance is missing.	D.C.	No
7	133463	T	1			Box damage resulting in damage to faceguard.	D.C.	Yes
				-	-		-	-
		-	-				-	-
				-	-		-	-

Appendix A

FTF Inspection and Test Report (Page 4 of 4)

HEPA Filter Rejection Codes

Rejection Type

Note: *Data in the Semi-Annual report will be binned using the following five rejection types.*

P – Penetration
R – Resistance
S – Specification/Purchase Order
T – Transportation/Packaging
F – Filter Defect/Deficiency

Rejection Class

Note: *To enable detailed comparisons between sites/contractors data, Monthly reports will include the following rejection classes.*

Penetration	
P1	Excessive penetration at 100% rated flow
P2	Excessive penetration at 20% rated flow
P3	Excessive penetration at both flows
Resistance	
R1	Excessive resistance at rated flow
Specification/Purchase Order	
S1	Special test or unique requirements not met
S2	Material of construction
S3	Labeling, (purchase order wide)
S4	Filter attributes (i.e. no faceguards when required, etc.)
S5	Documentation (C.O.C. not included, etc.)
S6	Label error
S7	Label missing or damaged
S6	Other
Transportation/Packaging	
T1	Container/carton damage
T2	Improper packaging
T3	Other

Filter Description Codes

Code	Description
MTL	Metal Filter
WD	Wood Filter
SEPLESS	Separtorless Filter Pack
GRD	Face Guards, X1 = 1 faceguard, X2 = 2 faceguards
GSK	Gasket
FS	Fluid Seal
UP	Upstream for either the gasket or the fluid seal
DN	Downstream for either the gasket or fluid seal
NIP	Nipple ended connection X1 one connection X2 two connections
CYL	Cylindrical Units

Filter Defects	
F1	Filter media pack (i.e. uneven pleats, etc.)
F2	Filter media (i.e., damages, holes, etc.)
F3	Frame, damage
F4	Frame, out of square
F5	Frame, dimensional tolerances (excluding out of square)
F6	Frame, other
F7	Gasket, adherence
F8	Gasket, damage
F9	Gasket, other
F10	Fluid seal, damage
F11	Fluid seal, other
F12	Faceguard
F13	Separator
F14	Other

Appendix B
Monthly Report Format

Purchaser	*Purchase Order Number*	*Item #*	*Mfg.*	*Size (cfm)*	*Model #*	*Quantity Tested*	*Testing Completed*	*Date Shipped*	*Number Rejected*	*Rejection Cause*
LANL	64657-001-08-9B	1	F	1500	0-007-U-43-03-NU-12-23-GG-FU5	2	6-Aug-08	7-Aug-08	0	
WSR	AC65795A	2	F	350	X-007-8-42-01-NU-13-13-Z96687B	1	11-Aug-08	12-Aug-08	0	
WSR	AC65832A	1	F	1000	D-007-W-42-R1-NU-13-13-Z07185	2	11-Aug-08	12-Aug-08	0	
WSR	AC64161A	1	F	1000	0-007-W-04-00-NU-11-13-GG-FU5	20	29-Jul-08	5-Aug-08	2	1-F7, 1-F3
WSR	AC64161A	2	F	1000	0-007-W-04-00-NU-11-13-GG-FU5	16	29-Jul-08	5-Aug-08	1	F4
WSR	AC64161A	3	F	1500	T-007-W-04-05-NU-51-13-GG-FU5	8	29-Jul-08	5-Aug-08	0	
WSR	AC64161A	4	F	1000	0-007-W-43-03-NU-11-23-GG-FU5	5	30-Jul-08	5-Aug-08	1	F5
WSR	AC64161A	5	F	50	0-007-D-42-03-NU-11-00-BB-DU5	6	30-Jul-08	5-Aug-08	0	
WSR	AC64161A	6	F	1000	0-007-W-04-00-NU-13-13-GG-FU5	4	29-Jul-08	5-Aug-08	1	F7
WSR	AC64161A	7	F	1000	0-007-W-42-N2-NU-00-13-Z77180J	10	30-Jul-08	5-Aug-08	2	2-P3
INL/CH2M-WG	711789	1	F	1000	T-007-W-43-05-NU-51-23-GG-FU5	4	5-Aug-08	6-Aug-08	0	
Fluor Hanford	35619	1	F	125	0-007-D-43-05-NU-51-23-CC-DU5	3	7-Aug-08	12-Aug-08	2	2-P3
WSR	AC65229A	1	F	1000	T-007-W-12-05-NU-51-23-GG-FU5	5	5-Aug-08	7-Aug-08	0	
WSR	AC65229A	2	F	1000	T-007-W-12-05-NU-51-23-GG-FU5	1	5-Aug-08	7-Aug-08	0	
WSR	AC65229A	3	F	1000	0-007-W-04-00-NU-11-13-GG-FU5	8	5-Aug-08	7-Aug-08	2	2-F4
Fluor Hanford	35670	1	F	1500	T-007-U-43-05-NU-51-23-GG-FU5	48	11-Aug-08	12-Aug-08	0	
WSR	AC67709A	1	F	1000	0-007-W-04-05-NU-52-12-GG-FU5	5	6-Aug-08	7-Aug-08	0	
INL/CH2M-WG	715077	1	F	1000	T-007-U-43-05-NU-51-23-GG-FU5	60	12-Aug-08	20-Aug-08	8	6-P3, 2-F4
WSR	AC67709A	2	F	1000	0-007-W-04-05-NU-52-12-GG-FU5	20	11-Aug-08	12-Aug-08	1	F5
WSR	AC67356A	1	F	1500	T-007-W-04-05-NU-51-13-GG-FU5	16	12-Aug-08	13-Aug-08	0	
WSR	AC67726A	1	F	50	0-007-C-04-00-NU-13-00-BB-DU5	13	20-Aug-08	20-Aug-08	2	1-P1, 1-F4
						257			**22**	
Notes:										

SURVEY OF PROTOCOLS FOR TESTING NON-SAFETY RELATED HEPA FILTERS

PLAN OF ACTION TO ADDRESS INCREASED HEPA FILTER REJECTION RATES ACTIONS 3.1 & 3.2

Department of Energy
Office of Health, Safety and Security

July 2009

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1.0 INTRODUCTION

1.1 *Background*

On March 17, 2008, the Department of Energy's (DOE) Office of Health, Safety and Security (HSS) received a letter from the Defense Nuclear Facilities Safety Board (DNFSB) requesting actions to address the increased high-efficiency particulate air (HEPA) filter rejection rates as reported in the FY 2007 semi-annual reports issued by the HSS Office of Corporate Safety Programs. These semi-annual reports provided the results of HEPA filter inspection and testing performed at the Filter Test Facility (FTF) and recommended further actions by the DOE site contractors to assess and report on the efficacy of the HEPA filter manufacturers' quality assurance programs.

In response to the DNFSB letter, a review team comprised of Federal and contractor employees experienced in HEPA filter testing, procurement, quality assurance (QA), engineering, and operations, drafted a plan of action to address several concerns expressed by the DNFSB regarding the increase in rejection rates from testing at the FTF. In July 2008, the *Plan of Action to Address Increased HEPA Filter Rejection Rates* was submitted to the DNFSB. One of the concerns raised by the DNFSB related to the testing of non-safety related HEPA filters in the facility ventilation system that have a confinement function for radioactive material as defined in DOE-STD-3020, *Specification for HEPA Filters Used by DOE Contractors*. A robust testing plan based on testing a sample of such filters is permitted by DOE-STD-3020 whereby the filter samples are tested at the FTF. However, the DNFSB cited the increased rejection rate and the prudency of using a test sampling program because of the increased rejection rates. To assess the existing protocols for testing such non-safety HEPA filters, Action 3.1 in the plan required that a site survey be conducted to (1) document protocols for testing the subject non-safety-related HEPA filters, and (2) identify the technical basis for any filter test sampling program that might be in use. Action 3.2 in the plan required the team to evaluate test sampling programs that may be in use to ensure that approaches meet DOE expectations for statistical sampling as specified in DOE-STD-3020.

1.2 *Survey Purpose, Scope, and Objectives*

On October 6, 2008, a letter (See Appendix A) with survey questions was sent to Program Secretarial Officers and Site Office Managers. The purpose of the survey was to assess the adequacy of sampling programs used by DOE site contractors for testing the non-safety related HEPA filters. Sites were requested to provide the following information:

- A description of any tailored QA testing program used, including scope and applicability, and the technical basis for establishing the current statistical sampling program to tailor the FTF testing.

- If the site contractor's program does not specify that a sample of non-safety related HEPA filters be tested at the FTF, describe what testing is done to meet the provisions of DOE-STD-3020.

1.3 *Survey Reference Documents*

- *Plan of Action to Address Increased HEPA Filter Rejection Rates*, July 2008
- DOE-STD-3020-2005, *Specification for HEPA Filters Used by DOE Contractors*

2.0 SURVEY RESULTS

The results of the survey are shown in Appendix B. All survey respondents indicated that a tailored QA testing program is not being used and that 100 percent of the subject filters are being sent to the FTF for inspection and testing, or that a program is being implemented to do so.

3.0 CONCLUSIONS

Based on the survey results, test sampling programs are not being used for non-safety related HEPA filters used in confinement ventilation systems at DOE defense nuclear facilities and 100 percent of the filters are or will be sent to the FTF for inspection and testing. This eliminates any concern regarding the adequacy of any sampling program to detect potentially defective filters that would not have been otherwise tested at the FTF.

APPENDIX A

LETTER TO PSOs AND SITE OFFICE MANAGERS

Department of Energy
Washington, DC 20585

October 6, 2008

MEMORANDUM FOR DISTRIBUTION

THROUGH: GLENN S. PODONSKY
CHIEF HEALTH, SAFETY AND SECURITY OFFICER
OFFICE OF HEALTH, SAFETY AND SECURITY

FROM: ANDREW C. LAWRENCE
DIRECTOR
OFFICE OF NUCLEAR SAFETY, QUALITY
ASSURANCE AND ENVIRONMENT
OFFICE OF HEALTH, SAFETY AND SECURITY

SUBJECT: Request for Information on Filter Test Facility Testing Non-Safety High Efficiency Particular Air Filters Used For Radioactive Confinement

On July 23, 2008, the Department of Energy (DOE) submitted a plan of action (Plan) to the Defense Nuclear Facilities Safety Board (DNFSB) to address several issues regarding the increased rejection rate of High Efficiency Particulate Air (HEPA) filters tested at the Air Techniques International Filter Test Facility (FTF). One of the issues relates to a specific category of filters that are designated as non-safety related but are providing radioactive material confinement in DOE nuclear facilities. These filters are not required by DOE to be 100 percent tested at the FTF. Since the increased rejection rate indicates problems in the manufacturers' quality assurance (QA) programs and filter manufacturing processes, the DNFSB requested information on actions planned by DOE to reassess the adequacy of the less than 100 percent testing provision for these non-safety-related filters.

The Secretary of Energy's letter to the DNFSB dated June 4, 2001, (and DOE-STD-3020-2005, *Specification for HEPA Filters Used by DOE Contractors*) states that "for all other applications, where HEPA filters are used in confinement ventilation systems for radioactive airborne particulate, develop and document an independent tailored filter QA testing program that achieves a high degree of fitness for service. The program should include the testing of a sample of filters at the FTF. The size of the sample to be tested should be large enough to provide sufficient statistical power and significance to assure the required level of performance." It is this category of HEPA filters about which the DNFSB has expressed concerns regarding the effectiveness of tailored QA sampling programs used to assure acceptable levels of quality and performance.

To assess the adequacy of any sampling program used for testing the aforementioned category of HEPA filters, a site survey is needed as outlined in Action 3.1 of the Plan. The survey will be used to gather information on what tailored filter testing programs are being used by DOE site contractors. Accordingly, please provide us with the following information:

1. A description of any tailored QA testing program used, including its scope and applicability, and the technical basis for establishing the current statistical sampling program for FTF testing.
2. If the site contractor's program does not specify that a sample of non-safety-related HEPA filters be tested at the FTF, describe what testing is done to meet the requirements specified in the Secretary's letter.

The Team that developed the Plan will evaluate the submitted information and will assess if the sampling programs meet DOE expectations for statistical sampling as specified in the Secretary of Energy's letter. Based on this assessment, appropriate recommendations will be made regarding the efficacy of any sampling program.

Please provide the above information no later than October 29, 2008. Questions may be directed to me at (301) 903-3777 or your staff may contact Subir Sen, at subir.sen@hq.doe.gov or (301) 903-6571.

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APPENDIX B

SURVEY RESPONSES ON FILTER TEST FACILITY TESTING

NON-SAFETY HEPA FILTERS USED FOR RADIOACTIVE CONFINEMENT IN DEFENSE NUCLEAR FACILITIES

Organization/Site	Summary of Response	Test 100% of all filters at FTF	Alternate Testing Program
National Nuclear Security Administration (NNSA)			
Kansas City Plant	Kansas City Plant does not have non-safety HEPA filters used for radioactive confinement. We do not have any processes that involve radioactive airborne particulate.	N/A	N/A
Savannah River Site Office	The two primary contractors send 100% of HEPA filters covered by the scope of the Secretary of Energy's June 4, 2001 letter to the DNFSB and DOE-STD-3020-2005 to the FTF for testing. A tailored Quality Assurance testing program is not used.	Yes	No
Pantex	The ventilation systems in Pantex nuclear facilities are not classified as confinement ventilation systems; therefore, they are not required to meet DOE-STD-3020-2005 criteria. Pantex does have facilities applicable to Section 4.1 of DOE-STD-3020-2005 and is in the process of implementing a HEPA filter program to address habitability systems and test sampling program for confinement ventilation systems for airborne radioactive particulate which will require 100% testing at the FTF for these HEPA filters.	Yes Revised program requiring 100% testing implemented	No
Lawrence Livermore National Laboratory (LLNL)	Lawrence Livermore National Laboratory (LLNL) is implementing 100% testing of all non-safety related	Yes Revised	No

Organization/Site	Summary of Response	Test 100% of all filters at FTF	Alternate Testing Program
	HEPA filters used in radioactive confinement systems. LLNL does not have a tailored HEPA filter QA testing program which specifically addresses statistical sampling of non-safety-related filters.	program requiring 100% testing implemented	
Nevada Test Site (NTS)	The Nevada Test Site (NTS) does not currently have a statistical sampling program for FTF testing of HEPA filters. There are currently 19 non-safety related HEPA devices (vacuums and air handlers) used in NTS facilities for radiological purposes, but only a few are in active use. Because of the small number of HEPA filters that are purchased on an annual basis, the current procurement policy of the NTS Management & Operations Contractor requires that all HEPA filters purchased for radiological purposes in facilities that are designated as non-safety related shall be tested at the Air Techniques International Filter Test Facility prior to delivery at the NTS.	Yes	No
Los Alamos National Laboratory (LANL)	LANL requires 100% of non-safety related HEPA filters intended for use in radioactive confinement applications to be tested at the Department of Energy (DOE) Filter Test Facility FTF) in accordance with ASME AG-1, Article FC-5200 and DOE-STD-3025-99.	Yes	No
Y-12	The Y-12 policy has been, and continues to be 100 percent testing of all HEPA filters (safety and non-safety related) at the FTF. Y-12 continues to address HEPA filter qualify by implementation of our maximum life criteria, initial and periodic aerosol testing of installed HEPA filters, and 100 percent testing of all HEPA filters at the FTF.	Yes	No
Sandia National Laboratory	Sandia National Laboratories (SNL) has a single	Yes	No

Organization/Site	Summary of Response	Test 100% of all filters at FTF	Alternate Testing Program
(SNL)	testing program for all High Efficiency Particulate Air (HEPA) filters which are used in safety related and non-safety applications for radioactive confinement. All HEPA filters within the scope of DOE-STD-3020-2005 are 100% tested through the FTF. A statistical sampling program is not used because the number of HEPA filters in non-safety-related applications is small and a 100% testing program was considered SNL policy. SNL provides 100% testing for all HEPA filters. This includes those non-safety-related HEPA filters used in confinement ventilation systems for Hazard Category III and radiological facilities.		
Office of Environmental Management (EM)			
Office of River Protection (ORP)	The WTP contractor is not yet in procurement of production HEPA filters. However, ORP verified that the WTP HEPA filter specifications require 100% testing at the FTF. For the TFOC, all HEPA filters, regardless of safety class, with a system flow rate greater than 20 acfm are sent to the FTF prior to delivery for site use. Filters with less than 20 acfm flow are exempted by language in Section 1.2 of DOE-STD-3020-2005	Yes	No
Richland Operations Office (RL)	As a policy, all RL contractor HEPA filters used in confinement ventilation systems are tested at the FTF regardless of safety classification; therefore, tailored Quality Assurance (QA) testing programs are not used. DOE-RL oversees three contractors which	Yes	No

Organization/Site	Summary of Response	Test 100% of all filters at FTF	Alternate Testing Program
	use non-safety HEPA filters used in confinement ventilation systems; CH2M HILL Plateau Remediation Company LLC (CHPRC), Fluor Hanford Inc., (FHI), and Washington Closure Hanford LLC (WCH).		
Oak Ridge Office	Responses for the three primary ORO-EM contractors are as follows: • **Isotek Systems, LLC**, has affirmed that they only use HEPA which have been tested at the FTF whether that use is for safety systems or for use in radiological material confinement. • **EnergX TN, LLC**, operator of the Transuranic Waste Processing Center, has confirmed that all safety system HEPA filters are tested at the FTF. EnergX did not have a requirement for FTF testing for HEPA filters that provide radioactive material confinement under abnormal conditions (positive pressure) for three process areas; the box breakdown area (BBA), the glove boxes, and the hot cell. These filters were certified by the supplier to a specification in the procurement which occurred prior to the issuance of DOE-STD-3020. EnergX has since confirmed that all replacement filters whether used in a credited or non-credited (i.e., inlet filters) application within confinement ventilation systems will in the future meet the requirements specified in DOE-STD-3020.	Yes Yes Yes	No No No
Carlsbad Field Office (CBFO)	The WIPP managing and operating (M&O) contractor, Washington TRU Solutions (WTS), is not using a tailored QA testing program for HEPA filters used in confinement ventilation systems. All HEPA	Yes	No

Organization/Site	Summary of Response	Test 100% of all filters at FTF	Alternate Testing Program
	filters used at the WIPP site for any functional class of confinement ventilation are drop-shipped to and tested at the FTF. This includes safety-related and non-safety-related HEPA filters used at the WIPP site.		
Idaho Operations Office	Responses form the two site contractors are as follows: • **CWI** tests 100% of HEPA filters at the Filter Test Facility (FTF). • **BBWI** is implementing a program to require 100% testing at the FTF.	Yes for CWI BBWI implementing program requiring 100% testing	No
Office of Science (SC)			
Pacific Northwest National Laboratory (PNNL)	PNNL is implementing a program to send all Non-Safety Related Filters, that are used for radioactive confinement function in the ventilation systems, to the DOE approved Filter Test Facility (FTF). Currently PNNL's procedures for purchasing these types of filters do not require this process. PNNL will revise its procedures to ensure that those types of filters are sent to the FTF.	PNNL implementing program requiring 100% testing	No