

Mr. Paul Coburn
Whirlpool Corporation
5401 U. S. 41 North
Evansville, Indiana 47727

Re: 163-12457-00022
PSD/Significant Source Modification to:
Part 70 permit No.: T163-7467-00022

Dear Mr. Coburn:

Whirlpool Corporation was issued Part 70 operating permit T163-7467-00022 on July 13, 1999 for a household refrigerators and ice makers manufacturing plant. An application to modify the source was received on July 6, 2000. Pursuant to 326 IAC 2-7-10.5 the following emission units to be located at 5401 U. S. 41 North, Evansville, Indiana 47727 are approved for construction at the source:

- (a) One (1) Foam-in-Place (FIP) Line No. 4, designated as Emission unit (EU-15), that will be utilized for variety of refrigerator models. This line is a closed-pour system where wet foam is injected through holes in the fully fabricated door panel;
- (b) Three (3) electric pre-heat ovens, associated with the FIP Line No. 4; one rated at 13 kilowatts (KW), one rated at 19KW; and one rated at 24 KW. The preheaters are used to warm the steel refrigerator, freezer doors and plastic liners; and
- (c) Two (2) closed and slightly pressurized chemical day tanks, associated with the FIP Line No. 4; one 150 gallon tank holding the polyol and blowing agent (HCFC-141b) master batch mixture and one 150 gallon tank holding the isocyanate compound (MDI).

The following construction conditions are applicable to the proposed project:

General Construction Conditions

1. The data and information supplied with the application shall be considered part of this source modification approval. Prior to any proposed change in construction which may affect the potential to emit (PTE) of the proposed project, the change must be approved by the Office of Air Quality (OAQ).
2. This approval to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.
3. Effective Date of the Permit
Pursuant to 40 CFR 124.15, 124.19 and 124.20, the effective date of this permit will be thirty-three (33) days after issuance.

4. Pursuant to 326 IAC 2-2-8(a)(1) this permit to construct shall expire if construction is not commenced within eighteen (18) months after receipt of this approval, or if construction is discontinued for a period of eighteen (18) months one or more.
5. All requirements and conditions of this construction approval shall remain in effect unless modified in a manner consistent with procedures established pursuant to 326 IAC 2.
6. Pursuant to 326 IAC 2-7-10.5(l) the emission units constructed under this approval shall not be placed into operation prior to revision of the source's Part 70 Operating Permit to incorporate the required operation conditions.

The proposed operating conditions applicable to these emission units are attached to this Source Modification approval. These proposed operating conditions shall be incorporated into the Part 70 operating permit as an administrative amendment in accordance with 326 IAC 2-7-10.5(l)(1) and 326 IAC 2-7-11.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter call (800) 451-6027, press 0 and ask for Aida De Guzman or extension (3-4972), or dial (317) 233-4972.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

APD

cc: File - Vanderburgh County
U.S. EPA, Region V
Vanderburgh County Health Department
Evansville EPA
Southwest Regional Office
Air Compliance Section Inspector - Scott Anslinger
Compliance Data Section - Karen Nowak
Administrative and Development - Janet Mobley
Technical Support and Modeling - Michele Boner

**PART 70 PSD/SIGNIFICANT SOURCE MODIFICATION
OFFICE OF AIR QUALITY
and Evansville EPA**

**Whirlpool Corporation
5401 U.S. Highway 41 North
Evansville, Indiana 47727**

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-2 and 40 CFR 52.21 (Regulations for Prevention of Significant Deterioration of air quality); and 40 CFR 124 (Procedure for decision Making), with conditions listed on the attached pages.

This approval is also issued in accordance with 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

PSD/Significant Source Modification No.:163-12457-00022	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date:

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SECTION D.8 FACILITY OPERATION CONDITIONS

- (a) One (1) Foam-in-Place (FIP) Line No. 4, designated as Emission unit (EU-15), that will be utilized for variety of refrigerator models. This line is a closed-pour system where wet foam is injected through holes in the fully fabricated door panel;
- (b) Three (3) electric pre-heat ovens, associated with the FIP Line No. 4; one rated at 13 kilowatts (KW), one rated at 19KW; and one rated at 24 KW. The preheaters are used to warm the steel refrigerator, freezer doors and plastic liners; and
- (c) Two (2) closed and slightly pressurized chemical day tanks, associated with the FIP Line No. 4; one 150 gallon tank holding the polyol and blowing agent (HCFC-141b) master batch mixture and one 150 gallon tank holding the isocyanate compound (MDI).

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.8.1 Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) Determination [326 IAC 2-2 and 40 CFR 52.21]

- (a) The use of the current blowing agent HCFC-141b in the proposed Foam-in place Line 4, until January 1, 2003 when HFC-245fa would be available for commercial use. The IDEM, OAQ shall be notified when the switch from HCFC-141b into HFC-245fa will be made.
- (b) The maximum wet chemical usage for the proposed Foam-in place Line 4 shall be limited to 2,948,400 pounds per twelve month total, rolled on a monthly basis. This wet chemical usage limitation and a loss factor of 0.026 pound of ozone depleting substance (ODS) per pound of wet chemical used will limit the ODS emissions to 38.3 tons per twelve month total rolled on a monthly basis.

During the first twelve month of operation, the wet chemical usage shall be limited such that the total usage divided by the accumulated months of operation shall not exceed 245,700 pounds per month, which shall result to an emissions of 3.2 tons of ODS per month, rolled on a monthly basis.
- (c) The West Laminator shall not be put back in operation.
- (d) Compliance with sections (a) through (c) of this condition shall satisfy the requirements under 326 IAC 2-2 Prevention of Significant Deterioration, and 40 CFR 52.21.
- (e) Compliance with (a) through (c) of this condition shall not apply to the operation of Foam-in-Place Line NO. 4 upon the conversion of its foam blowing agent to HFC-245fa and proper notification shall be made to IDEM, OAQ pursuant to Condition D.8.1(a).
- (f) The Permittee shall be permitted to conduct a production scale trial operations using HFC-245fa as the blowing agent on the proposed FID Line No. 4 and the other rigid polyurethane foaming lines. The duration of the trial operation shall not last more than thirty (30) days of total operating time.

D.8.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of the issued Part 70 permit T163-7467-00022, is required for this facility.

Compliance Determination Requirements

D.8.3 Testing Requirements [326 IAC 2-7-6(1),(6)] [326 IAC 2-1.1-11]

- (a) Compliance tests shall be performed during the period between 60 days after achieving maximum production rate but no later than 180 days after initial start-up on the proposed Foam-in-Place (FIP) Line No. 4, to verify the ozone depleting substance (ODS) loss factor of 0.026 pound per pound of wet chemical used (lb/lb).
- (b) All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

and

Evansville EPA
101 N.W. Martin Luther King Jr., Blvd., Room 250
Evansville, Indiana 47708

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

- (c) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).
- (d) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ, and Evansville EPA no later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ, and Evansville EPA if the source submits to IDEM, OAQ, a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.8.4 Record Keeping Requirements

- (a) To document compliance with Condition D.8.1, the Permittee shall maintain monthly records of the wet chemical used. Records maintained shall be taken monthly and shall be complete and sufficient to establish compliance with the ODS usage and emission limits established in Condition D.8.1.
- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of the issued Part 70 permit T163-7467-00022.

- (c) Compliance with section (a) and (b) of this condition shall not apply to the operation of Foam-in-Place Line No. 4 upon the conversion of its foam blowing agent to HFC-245fa.

D.8.5 Reporting Requirements

- (a) A quarterly summary of the information to document compliance with Condition D.8.1 shall be submitted to the addresses listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter period being reported. The report submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-7-1(34).
- (b) Compliance with the reporting requirements of this condition shall not apply to the operation of Foam-in-Place Line No. 4 upon the conversion of its foam blowing agent to HFC-245fa.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Air Quality
COMPLIANCE DATA SECTION
and
Evansville EPA

PART 70 SOURCE MODIFICATION
CERTIFICATION

Source Name: Whirlpool Corporation
Source Address: 5401 U.S. Highway 41 North, Evansville, Indiana 47727
Mailing Address: 5401 U.S. Highway 41 North, Evansville, Indiana 47727
PSD/Significant Source Modification No.: 163-12457-00022

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this approval.

Please check what document is being certified:

- 9 Test Result (specify) _____
- 9 Report (specify) _____
- 9 Notification (specify) _____
- 9 Other (specify) _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Date:

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF AIR QUALITY
 COMPLIANCE DATA SECTION
 and
 Evansville EPA**

Part 70 Source Modification Quarterly Report

Source Name: Whirlpool Corporation
 Source Address: 5401 U.S. Highway 41 North, Evansville, Indiana 47727
 Mailing Address: 5401 U.S. Highway 41 North, Evansville, Indiana 47727
 PSD/Significant Source Modification No.: 163-12457-00022
 Facility: Foam-in-Place (FIP) Line No. 4, designated as Emission unit (EU-15)
 Parameter: Ozone depleting substance (ODS)
 Limit: The maximum wet chemical usage for the proposed Foam-in place Line 4 shall be limited to **2,948,400** pounds per twelve month total, rolled on a monthly basis. This wet chemical usage limitation and a loss factor of **0.026** pound of ozone depleting substance (ODS) per pound of wet chemical used will limit the ODS emissions to **38.3** tons per twelve month total rolled on a monthly basis.

During the first twelve month of operation, the wet chemical usage shall be limited such that the total usage divided by the accumulated months of operation shall not exceed 245,700 pounds per month, which shall result to an emissions of 3.2 tons of ODS per month, rolled on a monthly basis.

YEAR: _____

Month	Column 1		Column 2		Column 1 + Column 2	
	Wet chemical Usage This Month	Equivalent ODS Emissions This Month	Wet chemical Usage Previous 11 Months	Equivalent ODS Emissions Previous 11 Months	Wet chemical Usage 12 Month Total	Equivalent ODS Emissions 12 Month Total
Month 1						
Month 2						
Month 3						

- 9 No deviation occurred in this quarter.
- 9 Deviation/s occurred in this quarter.
 Deviation has been reported on: _____

Submitted by: _____
 Title / Position: _____
 Signature: _____
 Date: _____
 Phone: _____

Attach a signed certification to complete this report.

**Indiana Department of Environmental Management
Office of Air Management**

**Technical Support Document (TSD) for a PSD/Significant Part 70 Source
Modification**

Source Background and Description

Source Name:	Whirlpool Corporation	
Source Location:	5401 U.S. Highway 41 North, Evansville, Indiana 47727	
County:	Vanderburgh	
SIC Code:	3632 and 3585	
Operation Permit No.:	T163-7467-00022	Issuance Date: July 13, 1999
PSD/Significant Source Modification No.:	163-12457-00022	
Permit Reviewer:	Aida De Guzman	

The Office of Air Management (OAM) has reviewed a modification application from Whirlpool Corporation relating to the construction of the following emission units:

- (a) One (1) Foam-in-Place (FIP) Line No. 4, designated as Emission unit (EU-15), that will be utilized for variety of refrigerator models. This line is a closed-pour system where wet foam is injected through holes in the fully fabricated door panel;
- (b) Three (3) electric pre-heat ovens, associated with the FIP Line No. 4; one rated at 13 kilowatts (KW), one rated at 19KW; and one rated at 24 KW. The preheaters are used to warm the steel refrigerator, freezer doors and plastic liners; and
- (c) Two (2) closed and slightly pressurized chemical day tanks, associated with the FIP Line No. 4; one 150 gallon tank holding the polyol and blowing agent (HCFC-141b) master batch mixture and one 150 gallon tank holding the isocyanate compound (MDI).

Polyurethane foam is produced through a reaction between hydroxyl with an isocyanate in the presence of a foam-blowing agent (HCFC-141b). Diphenyl methane diisocyanate (MDI) is combined with a master blend polyol, blowing agent (HCFC-141b), and a surfactant and catalyst to form the foam. The Polyurethane foam is injected or poured into refrigerator door assemblies, door panels, and various cabinets to provide rigidity and insulation. The foam completely expands and fills the void in the hollow door panel and hardens to provide the required insulation and rigidity.

History

On July 6, 2000, Whirlpool Corporation submitted an application to the OAM requesting to add a refrigerator and freezer doors foam insulation system. Whirlpool Corporation was issued a Part 70 permit on July 13, 1999.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
S15	Foam-in-Line No. 4	35	1.83	10,000	ambient

Recommendation

The staff recommends to the Commissioner that the PSD/Significant Part 70 Source Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on July 6, 2000. Additional information was received on August 30, 2000, September 25, 2000, October 10, 2000, and November 2, 2000.

Emission Calculations

(a) FIP Line No.4 Emissions:

The emissions from this operation is from the blowing agent loss, HCFC-141b (ozone depleting substance (ODS)) following injecting or pouring the wet foam and once the foam is cured. The blowing agent losses are estimated by material supplier to be approximately 21.6 percent weight of the wet foam.

WET FOAM:

Maximum wet foam consumption = 2 lbs/freezer door
 = 4 lbs/refrigerator door
 = 6 lbs/set
 Maximum production rate per hour = 360 lbs/hr
 Maximum production rate per year = 2,948,400 lbs/yr

REFRIGERATOR AND FREEZER DOORS:

Maximum production rate = 60 door sets/hour
 = 450 door sets/8-hr shift
 = 491,400 door sets per 8760 hrs/yr

Ozone-depleting substance (ODS) emissions are estimated based on the partial loss of blowing agent during injection and foam curing. Blowing agent comprises 24 percent by weight of the polyol master batch, and the injected wet foam (1:1 mix of master batch and MDI). The estimated blowing agent loss factor was provided by the material supplier. Note: No HAP (MDI) will be emitted because MDI is 100% reacted to form the polyurethane foam.

HCFC-141b in wet chemicals = 12.0 wt. percent (lb blowing agent

per lb of wet foam)

Estimated HCFC-141b loss = 21.6 wt. percent (lb ODS emitted per lb blowing agent)

HCFC-141b emission factor = 2.6 weight percent (%)

= 0.026 lb HCFC-141b emitted per lb wet chemical used

Maximum wet Chemical Usage (lbs/yr)	Emission Factor (lb/lb)	Potential ODS Emissions (tons/yr)
2,948,400	0.026	38.3

(b) **Contemporaneous Period:**
 The proposed FIP Line No.4 is expected to be installed in January 2001, therefore the effective contemporaneous period is January 1996 through January 2001. The time to issue the PSD permit has been considered in establishing the expected installation date.

(1) **4-Station Foamer Line Emissions:**

Operating Data (Worst Case)

Type	Maximum Hourly Production (Sets/hr)	Sets/yr
FIP Doors	-	-
LV BM	20	174,720
TOTAL		174,720

Product Mix (Worst Case)

Door	Percent
18 FIP	0
19 FIP	0
20/21 FIP	0
22 FIP	0
LV BM	100

Production Data

Door Type	Type	Shot Size (lbs)	Volume Units/year	Wet Chemical Usage (lbs/year)
18 FIP	FC	2.10	0	0
	RC	4.41	0	0

	Total	6.51	0	0
19 FIP	FC	2.95	0	0
	RC	4.18	0	0
	Total	7.13		0
20/21 FIP	FC	2.51	0	0
	RC	4.95	0	0
	Total	7.46	0	0
22 FIP	FC	3.04	0	0
	RC	4.36	0	0
	Total	7.40	0	0
LV Bottom	FC	2.34	174,720	409,544
Mounted	RC	5.51	174,720	962,707
	Total	7.85	-	1,372,251

Emissions (worst case)
 HCFC-141b in wet chemical = 12 percent (formulation data)
 Estimated HCFC-141b loss = 21.6 percent (material supplier data)
 HCFC-141b emission factor = 2.6 weight percent (%)
 = 0.026 lb HCFC-141b emitted per lb wet chemical used

Maximum wet Chemical Usage (lbs/yr)	Emission Factor (lb/lb)	Potential ODS Emissions (tons/yr)
1,372,251	0.026	17.78

(2) 50-lb Icemaker Emissions:

Operating Data (worst case)

Type	(Sets/hr	Sets/yr
50# IM	28	240,240
TOTAL		240,240

Production Data

Part		Shot Size (lbs/unit)	Volume (sets/yr)	Wet Chemical Usage (lbs foam/yr)
50# IM	Cabinet	3.86	240,240	926,125
	Door	0.66	240,240	158,775
	Lid	0.46	240,280	111,123

	Total	4.98		1,196,023
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Emissions (worst case)

HCFC-141b in wet chemical = 12 percent (formulation data)
 Estimated HCFC-141b loss = 21.6 percent (material supplier data)
 HCFC-141b emission factor = 2.6 weight percent (%)
 = 0.026 lb HCFC-141b emitted per lb wet chemical used

Maximum wet Chemical Usage (lbs/yr)	Emission Factor (lb/lb)	Potential ODS Emissions (tons/yr)
1,196,023	0.026	15.50

(3) Removal of West Laminator:

R-11 in wet chemicals = 12.62 percent (formulation data)
 Estimated R-11 loss = 21.6 percent (material supplier data)
 R-11 emission factor = 2.73 weight percent (%)
 = 0.0273 lb R-11 emitted per lb wet chemical used

HCFC-141b in wet chemicals = 12.87 percent (formulation data)
 Estimated HCFC-141b loss = 21.6 percent (material supplier data)
 HCFC-141b emission factor = 2.78 weight percent (%)
 = 0.0278 lb HCFC-141b emitted per lb wet chemical used

Emissions	CY 1992		CY 1993		CY 1994		CY 1995		CY 1996	
	lbs	tons	lbs	tons	lbs	tons	lbs	tons	lbs	tons
ODS	110,799	55.4	115,273	57.64	132,118	66.06	37,696	18.85	25,594	12.80

Note: ODS emissions through the end of 1994 were from operation of two laminator lines; per laminator line emissions assumed equal to one-half of the total.

Actual emission baseline calculations -

East Laminator Line: (equipment removed from normal service in December 1994; equipment removed in October 1995)

Actual emissions based on 2-year average of 1993 and 1994:

CY 1993 - 28.82 tons
CY 1994 - 33.03 tons
 2-year ave. 30.92 tons

West laminator Line; (equipment removed from normal service in December 1996; equipment removed in January, 1997)

Actual emissions based on 2-year average of 1995 and 1996

CY 1995 - 18.85 tons
CY 1996 - 12.80 tons
 2-year ave. 15.82 tons

Laminator Production Data

Product	CY 1992		CY 1993		CY 1994		CY 1995		CY 1996	
	Unit volume	total foam (lbs)	Unit volume	total foam (lbs)	Unit volume	total foam (lbs)	Unit volume	total foam (lbs)	Unit volume	total foam (lbs)
14' TM	228,995	590,120	319,709	823,890	271,447	796,968	270,147	793,152	116,437	341,859
16' TM	120,086	309,462	0	0	0	0	0	0	0	0
18' TM LD	296,297	863,409	0	0	0	0	0	0	0	0
18' TM MD	324,281	893,670	724,856	1,996,978	706,411	2,340,340	16	53	0	0
20' TM HD	358,084	1,077,117	366,258	1,101,704	334,161	1,202,645	0	0	0	0
21' BTM	0	0	0	0	0	0	47,338	287,578	62,641	380,544
22' TM	76,148	229,053	76,649	230,560	89,094	320,649	50,260	180,886	29,762	107,113
25' TM	0	0	20,482	75,640	22,239	91,981	22,810	94,342	22,042	91,166
Freezer	34,940	101,815	0	0	0	0	0	0	0	0
Total Foam	Total Foam	4,064,646 (R-11)		4,228,773 (R-11)		4,752,583 (HCFC-141b)		1,356,011 (HCFC-141b)		920,682 (HCFC-141b)

Laminator Process Data:

Door	Type	R-11 Shot Size (lbs)	HCFC-141b Shot Size (lbs)
14' TM	FC	0.74	0.91
	RC	1.837	2.026
	Total	2.577	2.936
16' TM	FC	0.74	0.91
	RC	1.837	2.026
	Total	2.577	2.936
18' TM LD	FC	0.822	1.011
	RC	2.092	2.51
	Total	2.914	3.521
18' TM MD	FC	0.881	1.046
	RC	1.874	2.267
	Total	2.755	3.313
20' TM HD	FC	0.982	1.163
	RC	2.026	2.436
	Total	3.008	3.599
21" BTM	FC	2.059	2.264
	RC	3.533	3.811
	Total	5.592	6.075
22' TM	FC	0.982	1.163
	RC	2.026	2.436
	Total	3.008	3.599
25' TM	FC	1.293	1.448
	RC	2.4	2.688
	Total	3.693	4.136
Freezer	FC	0.822	1.011
	RC	2.092	2.51
	Total	2.914	3.521

Contemporaneous Changes	Permit No.	Date Change Occur	Emissions (tons/yr)
Shutdown of the West Laminator	Evansville EPA Certificate of Operation No. 022-003-005	January 1997	- 15.82
Start-up 4-station FIP Door Press System (Clamshell Line), EU13	Insignificant Activity in TV163-7467-00022	1997	17.8
Start-up 50 lb Icemaker Foaming Line, EU14	Insignificant Activity in TV163-7467-00022	1999	15.5

SUMMARY OF NET OZONE DEPLETING SUBSTANCE (ODS) EMISSIONS INCREASE (TONS/YEAR)	
Description of Emission Change	ODS Emission Change)
Proposed FIP Line No.4	38.3
4-Station FIP Door Press System	17.8
50 lb. Icemaker Foaming Line	15.5
West Laminator (shutdown)	- 15.82
Net ODS Emissions Increase	55.78*

*The net emissions increase will become zero once the source switched to HCF-245fa on January 1, 2003.

Potential To Emit of Modification

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA.”

This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Pollutant	Potential To Emit (tons/year)
PM	0.0
PM-10	0.0
SO ₂	0.0
VOC	0.0
Ozone Depleting Substance (ODS)	55.78
CO	0.0
NO _x	0.0

Justification for Modification

Pursuant to 326 IAC 2-7-10.5(g), the Part 70 Operating permit is being modified through a PSD/Significant Source Modification, because the modification’s net emissions increase ozone depleting substance (ODS) or the potential to emit is greater than zero (0), pursuant 326 IAC 2-2-1(w).

County Attainment Status

The source is located in Vanderburgh County.

Pollutant	Status (attainment, maintenance attainment, or unclassifiable; severe, moderate, or marginal nonattainment)
PM-10	attainment
SO ₂	attainment
NO ₂	attainment
Ozone	maintenance
CO	attainment
Lead	not determined

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) are precursors for the formation of ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to the ozone standards. Vanderburgh County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Vanderburgh County has been classified as attainment or unclassifiable for all the other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Source Status

Existing Source PSD or Emission Offset Definition (based on the Airs Facility Subsystem Quicklook Report, dated January 22, 1999):

Pollutant	Emissions (tons/year)
PM	0.50
PM-10	14.9
SO ₂	74.6
VOC	619.7
CO	11.7
NO _x	40.2

This existing source is a major stationary source because an attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not one of the 28 listed source categories.

Potential to Emit of Modification After Issuance

PSD emissions from the proposed modification (reflecting all limits of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification).

Process/facility	Potential to Emit (tons/year)						
	PM	PM-10	SO ₂	VOC	CO	NO _x	HCFC-141b (ODS) (Any Pollutant regulated under the Clean Air Act that are not listed in 326 IAC 2-2-1(w))
Proposed Modification	0.0	0.0	0.0	0.0	0.0	0.0	38.3
Contemporaneous Increases	0.0	0.0	0.0	0.0	0.0	0.0	33.3
Contemporaneous Decreases	0.0	0.0	0.0	0.0	0.0	0.0	- 15.82
Net Emission Increase	0.0	0.0	0.0	0.0	0.0	0.0	55.78
PSD Significant Levels	25	15	40	40	100	40	> 0

This modification to an existing major stationary source is major because the ozone depleting substance (ODS) emission, which is a pollutant subject to regulation under the Title VI of the Clean Air Act that is not listed in 326 IAC 2-2-1(w) is emitted at greater than zero (0). Therefore, the modification is subject to PSD, pursuant to 326 IAC 2-2, and 40 CFR 52.21.

Federal Rule Applicability

- (a) New Source Performance Standards (NSPS):
 - (1) 40 CFR Part 60.450, Subpart SS - Standards of Performance for Industrial Surface Coatings: Large Appliances. The provisions of this subpart apply to each surface coating operation in a large appliance surface coating line.

This NSPS is not applicable to this modification as it does not involve any surface coating of the refrigerators and freezers. This modification only involves insulation of the refrigerator and freezer doors through foam injection blowing.
 - (2) There are no other New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this proposed modification.
- (b) National Emission Standards for Hazardous Air Pollutants (NESHAPs):
 There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this proposed modification.

PSD Rule Requirements

- (a) 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) and 40 CFR52.21:
 The requirements of these rules will apply to the proposed installation of one (1) Foam-in-Place (FIP) Line No. 4, which is a modification to an existing major source. The modification will emit HCFC-141b (ODS) at levels greater than zero (0).
- (b) 326 IAC 2-2-3 (PSD Rule: Best Available Control Technology (BACT))
 Pursuant to 326 IAC 2-2-3(a)(3), a major PSD modification shall apply Best Available Control Technology (BACT) for each pollutant subject to regulation under the provisions of the Clean Air Act for which said modification would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase of the pollutant would occur.

BACT Analysis

- (1) The “BACT Analysis” submitted by Whirlpool Corporation was based on the Draft “Top Down Approach: BACT Guidance” by USEPA, Office of Air Quality Planning Standards, March 15, 1990. The analysis includes the use of the following:
 - (a) BACT/RACT/LAER Information System; USEPA, BACT/RACT/LAER Clearinghouse 1990;
 - (b) Compilation of Control Technology: USEPA, BACT/RACT/LAER Clearinghouse 1990;
 - (c) EPA, State, and Local Air Quality Permits and Applications;
 - (d) Federal, State and Local Permit Engineers;
 - (e) Vendors/Suppliers; and
 - (f) OAQPS Control Cost Manual and Trade Journals
- (2) PSD BACT or State BACT established for some sources in the appliance industry as compared with Whirlpool Corporation:

PSD/State BACT Established for Some Sources in the Appliance Industry as Compared to Whirlpool Corporation				
Company Name	Type of Operation	Capacity	Permit & Date Issued	Control Technique or Control Technology
Norcold - Sidney, Ohio	Use of CFC-22 in the Cabinet/Door Foaming Operations	560 to 5,360 lbs/day of wet foam	05-6468; 05-8269 6/7/95; 8/7/96	No Control
Whirlpool Corporation - LaVergne, Tennessee	Use of HCFC-141b in the Cabinet/Door Foaming Operations	225 lbs/hour of wet foam	141-14 5/28/98	No Control
General Electric, Appliance Division - Louisville, Kentucky	Use of HCFC-141b in the Cabinet/Door Foaming Operations	250 - 2,150 lbs/hour of wet foam	30-95-0	No Control

Whirlpool Corporation - Evansville, Indiana	Use of CFC-11 in the Cabinet/Door Foaming Operations	1,200 lbs/hour - Foam-in-place line 1	Evansville, EPA 022- 003-002 1/25/93	Conversion to HCFC- 141b and no additional control
		9,360 lbs/hour total - 12-station cabinet foamer & 27-station cabinet foamer		
		800 lbs/hour - Foam- in-place door line 2	Evansville, EPA 022-003-005 3/9/92	Conversion to HCFC- 141b and no additional control
		157 lbs/hour - 4-station (Clamshell) foam-in-place door line #3	Evansville, EPA I-MOD-022-003-002 2/28/97	Conversion to HCFC- 141b and no additional control
		137 lbs/hr - 50 lb. IM foaming line	IDEM Permit T163- 7467-00022 7/13/99	Conversion to HCFC- 141b and no additional control
Whirlpool Corporation - Ft. Smith, Arkansas	Use of CFC-11 in the Cabinet and Door Foam Lines SN-05, 05A, 06, 07, 08, and 08A	6000 lbs/hour & 52,000,000 lbs/year of wet foam plantwide	796-AR-6 1994	Conversion to HCFC- 141b as blowing agent and no additional control
Whirlpool Corporation - Evansville, Indiana	Use of HCFC- 141b in the Foam-in place Line 4	360 lbs/hour & 2,948,400 lbs/year wet foam	PROPOSED	Conversion of HCFC- 141b to non ODS (HFC- 245fa) when available by January 1, 2003

(a) Alternative Blowing Agents for HCFC-141b:

The following blowing agents have been identified by EPA as possible substitute for HCFC-141b through **the Significant New Alternatives Policy (SNAP)** program: water, carbon dioxide (CO₂), HFC-134a, HFC-152a, HFC-245fa, Exxol blowing agents, Saturated Light Hydrocarbons C3-C6, and Formic Acid.

S Water - **does not represent a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No. 4 foaming operation. In general, water-based rigid polyurethane foams show poor thermal conductivity and poor aging characteristics in appliance applications. Water-based foams are possibly more suited to production of extruded expanded polystyrene (XPS) insulating boardstock. Water contained in the polyol component chemicals will react with the isocyanate component of Whirlpool's wet foam to form and release CO₂. The use/presence of CO₂ rigid polyurethane foam results in a higher open-cell content in the cured foam, which is directly related to its expected poor thermal conductivity. In comparison to HCFC-141b which has a reported gas-phase thermal conductivity of 9.7 mW/mK at 25°C. CO₂-blown foams which were tested in XPS-boardstock applications showed a gas-phase thermal conductivity of 16.6 mW/mK at 25°C. This represents a decrease in thermal efficiency of over 40 percent. Although thermal conductivity data is not available for CO₂-

blown rigid polyurethane foams, the results would be expected to be very similar to that found for XPS-boardstock.

The issue of aging is also related to thermal conductivity performance. The insulating integrity of foam over time is directly related to the diffusion rate of the blowing agent used in manufacturing the original foam. In general, gaseous blowing agents (e.g., CO₂) will have a higher rate of diffusion than blowing agents that are originally liquid (e.g., HCFC-141b, HFC-245fa). Over time, as blowing agent diffuses through the foam and is lost, the foam's thermal conductivity increases and its insulating properties are diminished. On tests conducted on XPS-boardstock, CO₂-blown foams reported diffusion rates three orders of magnitude higher than liquid HCFC blowing agents. Again, data is not available for CO₂-blown rigid polyurethane foams; however, the relative comparison of diffusion rates results would be expected to be very similar to that found for XPS-boardstock.

- S** CO₂ - **does not represent technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No. 4 foaming operation. Rather than producing CO₂ for foam blowing by reaction of water (or formic acid as describe below) with isocyanate, gaseous CO₂ can be added as an independent material as the foamer head. The use of gaseous CO₂ raises the same issues described above for the use of water.

The use of CO₂ as a blowing agent also causes dimensional problems with the finish product rigid polyurethane foam. Because of its gaseous nature CO₂ is difficult to control and the excessive rate in which it attempts to escape the wet foam as it cures creates a vacuum in the foam cells. The vacuum condition in the foam cells causes them to collapse thus making the cured foam dimensionally unstable. Further, CO₂-blown foams become unacceptably hot and do not de-mold properly.

- S** HFC-134a - **does not represent a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No.4 foaming operation. HFC-134a is a gaseous material with poor solubility in the polyol component of wet foam. To accommodate its use HFC-134a would have to be mixed with a water carrier; the difficulties of the use of water (and resulting presence of CO₂) were previously discussed. The use of HFC-134a for FIP Line No.4 would also require Whirlpool to design and install a completely separate wet chemical supply system including pressurized gas handling and storage equipment. The proposed use of HCFC-141b (and HFC-245fa in the future) will allow FIP Line No.4 to share the wet chemical supply system common to Whirlpool's other Evansville foaming operations. The use of HFC-134a raises two additional issues. Because of its gaseous nature, it has the potential to cause improper mixing

of the foam components and frothing. In addition, HFC-134a-blown rigid polyurethane foam does not offer the thermal conductivity of 9.7 mW/mK at 25°C, HFC-134a-blown foams.

The use of HFC-134a raises two additional issues. Because of its gaseous nature, it has the potential to cause improper mixing of the foam components and frothing. In addition, HFC-134a-blown rigid polyurethane foam does not offer the thermal conductivity of HCFC-141b. In comparison to HCFC-141b which has a reported gas-phase thermal conductivity of 9.7 mW/mK at 25°C, HFC-134a-blown foams which were tested in rigid polyurethane foam applications showed a gas-phase thermal conductivity of 13.5 mW/mK at 25°C. This represents a decrease in thermal efficiency of nearly 30 percent.

- S HFC-152a - **does not represent a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No. 4 foaming operation. HFC-152a is a highly flammable gas that would require specific handling procedures. HFC-152a offers poor thermal conductivity and aging characteristics. In comparison to HCFC-141b which has a reported gas-phase thermal conductivity of 9.7 mW/mK at 25°C, HFC-152a-blown foams which were tested in XPS-boardstock applications showed a gas-phase thermal conductivity of 13.4 mW/mK at 25°C. This represents a decrease in thermal efficiency of nearly 30 percent. With respect to aging/blowing agent diffusion, in tests conducted on XPS-boardstock, HFC-152a blown foams reported diffusion rates three orders of magnitude higher than liquid HCFC blowing agents. Again, although data is not available for HFC-152a-blown rigid polyurethane foams, the relative comparison of thermal conductivity and diffusion rate results would be expected to be similar to that found for XPS-boardstock.

The issue of aging is also related to thermal conductivity performance. The insulating integrity of foam over time is directly related to the diffusion rate of the blowing agent used in manufacturing the original foam. In general, gaseous blowing agents (e.g. CO₂) will have a higher rate of diffusion than blowing agents that are originally liquid (e.g., HCFC-141b, HFC-245a). Over time, as blowing agent diffuses through the foam and is lost, the foam's thermal conductivity increases and its insulating properties are diminished. On tests conducted on XPS-boardstock, CO₂-blown foams reported diffusion rates three orders of magnitude higher than liquid HCFC blowing agents. Again, data is not available for CO₂-blown rigid polyurethane foams; however, the relative comparison of diffusion rate results would be expected to be very similar to that found for XPS-boardstock.

- S Exxol and other saturated light hydrocarbons (C3 - C6) - **do not represent technically feasible options** to replace HCFC-141b

as the blowing agent in the proposed FIP Line No.4 foaming operation. Exxol is a Pentane-based blowing agent blend manufactured and supplied by Exxon. There are four main issues that negate the viability of these materials. First, Pentane-blown rigid polyurethane foam offers very poor thermal conductivity performance. Secondly, the conversion to a Pentane-blown foam for the FIP line No.4 would require Whirlpool to redesign and install a completely separate wet chemical supply system. The proposed use of HCFC-141b (and HFC-245a in the future) will allow FIP Line No. 4 to share the wet chemical supply system common to Whirlpool's other Evansville foaming operations. Relatedly, the use of Pentane-based blowing agents raises serious issue of safety around the use of flammable hydrocarbons as a blowing agent in a December 6, 1999 Federal Register notice (64FR 68041) and, in fact state therein that safety around the use of these materials cannot be absolutely guaranteed. Whirlpool will not install equipment with the potential to cause catastrophic results if handled improperly without completely proven methods to reduce associated risks.

The last issue related to Exxol and like-kind blowing agents is their seeming contradiction to the objective of EPA's SNAP Program. The SNAP Program is intended to promote substitution for HCFC with the use of less environmentally egregious materials. These hydrocarbon-based alternative materials are considered volatile organic compounds (VOC) and would participate in lower atmospheric photochemical oxidation reaction to form ozone. The resulting VOC emissions from such a conversion would certainly have a more deleterious affect on environment by adversely effecting the future ozone designations of Vanderburgh and Warrick Counties, than the effect of negligible amount of ODS emissions (HCFC-141b) on the global issue over the next two years until the conversion of HFC-245fa is complete.

- S Formic Acid - **does not represent a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No.4 foaming operation. Formic Acid has a boiling point of about 101°C (215°F). Whirlpool's foaming operation occurs at near ambient temperature, therefore, Formic Acid's relatively high boiling point raises questions as to its viability as a blowing agent. The use of Formic Acid as the blowing agent would require reformulation of the wet foam chemistry as Formic Acid would react with the Whirlpool current catalysts rendering them useless. In addition, Formic Acid will react with the isocyanate component in the wet foam to form and release CO₂. As described above, the use/presence of CO₂ in rigid polyurethane foam is impractical and results in poor thermal conductivity performance.
- S Pentane - **is a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No.4 foaming operation. Pentane has no ozone-depletion potential but is defined as a volatile organic compound (VOC). **As a VOC, pentane causes lower atmospheric ozone formation** through participation in atmospheric photochemical oxidation reaction.

Although pentane is technically feasible, using it as substitution **was rejected** by Whirlpool as BACT because the resulting VOC emissions are more environmentally polluting than ODS. Its use as the blowing agent for FIP Line No. 4 would negatively contribute to local ambient air quality impacts and adversely affect maintenance of attainment status of Vanderburgh County for ozone.

- S HFC-245fa - **is a technically feasible option** to replace HCFC-141b as the blowing agent in the proposed FIP Line No.4 foaming operation. EPA has identified it under its **Significant New Alternatives Policy (SNAP)** program that HFC-245fa is an acceptable substitute for HCFC141b for sprayed foam applications. HFC-245fa contains no chlorine or bromine, therefore, it has zero ozone depleting potential (ODP). It is not regulated as an ODS nor as a VOC and it is a non-flammable blowing agent. Therefore, **the conversion to HFC-245fa is the BACT chosen by Whirlpool Corporation, and the conversion will take place before January 1, 2003, which is EPA phased out production schedule.**

Even Whirlpool would consider an early compliance of this HCFC usage ban, only Honeywell (formerly Allied Signal) is producing laboratory/Research and Development scale levels of HFC-245fa. "EPA also believes it is too soon to determine the availability of substitutes including HFC-245fa for Class II substances (HCFCs) because in many industrial sectors, that market is just beginning to develop".

Economic Analysis

The following is the cost analysis for immediate conversion of HCFC-141b to HFC-245fa (if HFC-245fa is available). This cost analysis is only for material substitution and does not include the equipment that will be utilized once material conversion is made:

Direct Annual Costs:		
Materials Cost	-	\$ 1,341,600
	-	318,420
Incremental Cost to Convert Blowing Agent	-	\$ 1,023,180/year
Baseline Emission Rate	-	38.3 tons/year
Total Pollutant Removed	-	38.3 tons/year
Average Cost Effectiveness of BACT Option	-	\$ 26,750/ton removed

PSD Best Available Control Technology:

- (1) The use of the current blowing agent HCFC-141b in the proposed Foam-in place Line 4, until January 1, 2003 when HFC-245fa would be available for commercial use. The IDEM, OAM shall be notified when the switch from HCFC-141b into HFC-245fa will be made.
- (2) The maximum wet chemical usage for the proposed Foam-in place Line 4 shall be limited to 2,948,400 pounds per twelve month total, rolled on a monthly basis. This wet chemical usage limitation and a loss factor of 0.026 pound of ozone depleting substance (ODS) per pound of wet chemical used will limit the ODS emissions to

38.3 tons per twelve month total rolled on a monthly basis.

During the first twelve month of operation, the wet chemical usage shall be limited such that the total usage divided by the accumulated months of operation shall not exceed 245,700 pounds per month, which shall result to an emissions of 3.2 tons of ODS per month, rolled on a monthly basis.

- (3) The West Laminator shall not be put back in operation.
 - (4) Compliance with sections (1) through (3) of this condition shall satisfy the requirements under 326 IAC 2-2 Prevention of Significant Deterioration, and 40 CFR 52.21.
 - (5) Compliance with (1) through (3) of this condition shall not apply to the operation of Foam-in-Place Line NO. 4 upon the conversion of its foam blowing agent to HFC-245fa and proper notification shall be made to IDEM, OAM pursuant to Condition D.8.1(1).
 - (6) The Permittee shall be permitted to conduct a production scale trial operations using HFC-245fa as the blowing agent on the proposed FID Line No. 4 and the other existing rigid polyurethane foaming lines. The duration of the trial operations shall not last more than thirty (30) days of total operating time. .
- (c) 326 IAC 2-2-4 (PSD Rule: Air Quality Analysis Requirements):
 - (d) 326 IAC 2-2-5 (PSD Rule: Air Quality Impact, Requirements):
 - (e) 326 IAC 2-2-6 (PSD Rule: Increment Consumption Requirements):
 - (f) 326 IAC 2-2-7 (PSD Rule: Additional Analysis Requirements):

The above PSD Rule requirements in Sections 4 through 7 are not applicable to a stationary source modification involving a significant net emissions increase of Ozone Depleting Substance (ODS), nor is there a National Ambient Air Quality Standard (NAAQS) for ODS. Further, Federal and State PSD regulations do not define acceptable air quality thresholds or air quality increments for ODS.

- (g) 326 IAC 2-2-8 (PSD Rule: Source Obligation):
 - (1) Pursuant to 326 IAC 2-2-8(a)(1) - Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is not completed within reasonable time.
 - (2) Pursuant to 326 IAC 2-2-8(a)(2) - Approval for construction shall not relieve any owner or operator of the responsibility to comply fully with applicable provisions of the Indiana Implementation Plan, and any other requirements under local, state or federal law.
- (h) 326 2-2-10 (PSD Rule: Source Information)
The owner operator of a proposed PSD modification shall submit all information necessary to perform any analysis or make any determination required under this rule, 326 IAC 2-2.

Whirlpool Corporation has submitted the information necessary to perform analysis or make the determination required under PSD review.

- (i) 326 IAC 2-2-11 (PSD Rule: Stack Height)
This rule requirement applies to a source which commenced construction after December 31, 1970.
- (j) 326 IAC 2-2-12 (PSD Rule: Permit Rescission)
The PSD permit or the significant source modification permit shall remain in effect unless it is rescinded, modified, revoked or expires.

State Rule Applicability - Individual Facilities

- (a) 326 IAC 2-6 (Emission reporting)
This modification by itself which emits ODS is **not** subject to 326 IAC 2-6, because HCFC-141b (ODS) is not a volatile organic compound (VOC) nor it is one of the pollutants subject in the rule. However, the source which is a Title V source has been determined to be subject to 326 IAC 2-6, because its NOx, and VOC potential to emit are at levels greater than ten (10) tons per year. Pursuant to this rule, the owner/operator of the source must annually submit an emission statement for the source. The annual statement must be received by April 15 of each year and contain the minimum requirement as specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8) (Emission Statement Operating Year).
- (b) 326 IAC 8 (Volatile Organic Sources)
There are no provisions in Article 326 IAC 8 that will apply to the proposed Foam-in-Place (FIP) Line No. 4, because it emits HCFC-141b (ODS) which is a non-photochemically hydrocarbon.
- (c) 326 IAC 8-1-6 (General Reduction Requirements)
This rule applies to new facilities as of January 1, 1980, which have potential Volatile Organic Compounds (VOC) emissions of 25 tons or more per year, which are not otherwise regulated by other provisions of Article 8. Although the proposed Foam-in-Place (FIP) Line No. 4 emits HCFC-141b (ODS) at levels greater than 25 tons per year, it is **not** subject to this rule because HCFC-141b (ODS) is not a VOC, it is a non-photochemically hydrocarbon.
- (d) 326 IAC 2-4.1-1 (New Source Toxic Control)
This rule applies to new construction, reconstruction of a major source of hazardous air pollutant (HAP) after July 27, 1997. This rule is **not** applicable to this proposed Foam-in-Place (FIP) Line No. 4, because it emits HCFC-141b (ODS) which is not a HAP.
- (e) There are no other possible rules that may apply to the proposed Foam-in-Place (FIP) Line No. 4.

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed **PSD/Part 70 Significant Source Modification No. 163-12457-00022**.

Indiana Department of Environmental Management Office of Air Quality

Addendum to the Technical Support Document for a PSD/Significant Part 70 Source Modification

Source Name: Whirlpool Corporation
Source Location: 5401 U.S. Highway 41 North, Evansville, Indiana 47727
County: Vanderburgh
SIC Code: 3632 and 3585
Operation Permit No.: T163-7467-00022 Issuance Date: July 13, 1999
PSD/Significant Source Modification No.: 163-12457-00022
Permit Reviewer: Aida De Guzman

On January 5, 2001, the Office of Air Quality (OAQ) had a notice published in the Evansville Courier, Evansville, Indiana, stating that Whirlpool Corporation had applied for a PSD/Significant Part 70 Source Modification to construct and operate one (1) foam-in place line, that will be utilized for insulation of variety of refrigerator doors. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

- (1) Indiana Department of Environmental Management, Office of Air Management has changed its name to Indiana Department of Environmental Management, Office of Air Quality. Therefore, all the documents in the proposed permit which referenced to the old name were revised to reflect the new name.
- (2) On January 22, 2001, IDEM, OAQ received a letter from Jock and Kathleen Stucki of 4116 Saddlebrooke Lane, Evansville, Indiana 47715 requesting a public hearing. The letter did not specify any concerns or issues about the proposed permit. However, IDEM, OAQ has contacted Mr. Stucki via telephone on January 30, 2001 to address all his concerns or issues about the permit. The following issues were raised during the telephone conversation:
 - (a) Why is IDEM, OAQ allowing Whirlpool to use this type of ozone depleting raw material (HCFC-141b)?
 - (b) Why would IDEM, OAQ not require Whirlpool to convert to HFC-245fa now, and why wait until 2003?
 - (c) Why would IDEM, OAQ not require Whirlpool to collect the ODS emissions and destroy it using a control unit?

Responses:

- (a) Mr. Stucki had the impression that HCFC-141b is a new raw material that will be used by Whirlpool in their process operations. He was told that this material is already being used by Whirlpool in their existing foam-in-place line, and the proposed permit is for a new foam-in-place line.

Previously, Whirlpool was using CFC-11, which has a higher ozone depletion potential at 1.0 ODP. CFC-11 was banned by EPA on January 1, 1996 and was replaced by HCFC-141b which has a lower ozone depleting potential at 0.12 ODP.

- (b) IDEM, OAQ, has looked into other types of blowing agent that it can require Whirlpool to substitute for the HCFC-141b like; Water, CO₂, HFC-134a, HFC152a, formic acid, exxol and other saturated light hydrocarbons, pentane, and HFC245fa. Only exxol and other saturated light hydrocarbons, pentane, and HFC-245fa were found to be technically feasible, however, these materials will emit VOC, which forms ground-level ozone. Even Whirlpool would consider an early compliance of this HCFC usage ban, only Honeywell (formerly Allied Signal) is producing laboratory/Research and Development scale levels of HFC-245fa. "EPA also believes it is too soon to determine the availability of substitutes including HFC-245fa for Class II substances (HCFCs) because in many industrial sectors, that market is just beginning to develop".
- (c) IDEM, OAQ, has looked into the possibility of requiring Whirlpool to collect the ODS emissions and venting it to a control unit for destruction, However, IDEM, OAQ did not find any plant or source in the country that utilizes a control unit to destroy ODS.

IDEM, OAQ, has applied the most stringent applicable requirements to Whirlpool proposed foam-in-place line, which is state rule 326 IAC 2-2 and federal rule 40 CFR 52.21 (Prevention of Significant Deterioration), although the ODS emission of 38.3 tons per year from the proposed project plus 17.48 tons per year from previous permitted units is not significant. State rule 326 IAC 2-2-1(x) and current federal regulations specify "any emissions rate" as significance level for ODS. "EPA has raised the significance level of ODS to 100 tons per year for determining PSD applicability to modifications at major stationary sources, in the proposed federal regulations 40 CFR Part 51 and 52 . Since emissions causing stratospheric ozone depletion is strictly a global problem, no appreciable local ambient impact will result from emissions from a particular source" (e.g. Whirlpool).

EPA has stated that it will not object to a source emitting below 100 tons per year, without conducting a PSD review for ODS emissions, per EPA Memo from John Seitz to Gustave Von Bodungen dated February 24, 1998.

This TSD Addendum was faxed to Mr. Jock Stucki on January 31, 2001 and on February 2, 2001 he sent a confirmation via e-mail that he is withdrawing his request for a public hearing.