



HAND DELIVERED
12/18/2019
MRG

Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

December 18, 2019

Ed Orris, P.E., New Source Review Chief
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222



RE: Shell Chemical Appalachia LLC
Shell Polymers Monaca Site
Potter and Center Townships, Beaver County
Plan Approval Application - Supplemental GHG BACT Analysis

Dear Mr. Orris:

Shell Chemical Appalachia LLC ("Shell") is pleased to submit this application to Pennsylvania Department of Environmental Protection (PADEP) for review and approval. This application would incorporate Best Available Control Technology (BACT) requirements for regulation of Greenhouse Gas (GHG) emissions from the SF₆-Insulated High Voltage Equipment associated with the cogen area.

This application contains the following information.

- Section 1.0 General Information Form
- Section 2.0 Compliance Review Form
- Section 3.0 Processes Plan Approval Application (excluding pages 6-12 which are not relevant for this update)
- Section 4.0 Municipal Notifications and Receipts
- Attachment 1 – Emissions Estimates
- Attachment 2 – BACT Determination
- Attachment 3 – Supporting Documentation
- A check made payable to PADEP in the amount of \$22,700 for the total processing fee in accordance with 25 Pa Code §127.702(f)(3).

The following people have received Municipal Notifications.

Mr. Daniel C. Camp III
Chairman, Beaver County Commissioners
Beaver County Courthouse
810 Third St.
Beaver, PA 15009
dcamp@beavercountypa.gov

Mr. Bill DiCioccio, Jr.
Chairman, Center Township Board of Supervisors
224 Center Grange Rd.
Aliquippa, PA 15001
bdiciocciojr@ctbos.com

Ms. Rebecca Matsco
Chairwoman, Potter Township Board of Supervisors
300 Mowry Rd.
Monaco, PA 15061

The emissions estimates presented in Attachment 1 are based on the system design criteria (maximum 0.1% leak rate per year at the nominal filling pressure for gas-insulated switchgear (GIS) and 0.5% for transformers). Based on this maximum design leakage rate, SF₆ potential to emit (PTE) from all SF₆-Insulated High Voltage Equipment is calculated at 75 lbs/yr. When adjusted for global warming potential (GWP), CO₂e PTE will not exceed 854 tpy. This value is approximately 0.25% of the cogeneration units' PTE for GHG emissions.

Based on the GHG BACT analysis contained in Attachment 2, Shell is proposing the following as BACT for the SF₆ emissions from the SF₆-Insulated High Voltage Equipment:

- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.1 percent or less per year for GIS equipment.
- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.5 percent or less per year on transformers.
- Install and operate a density monitor alarm system that will alert the operator when 10 percent (%) of the SF₆ by weight escapes from any SF₆-Insulated High-Voltage Equipment.
- Monitor the SF₆ containing equipment within the Main Incoming Substation building against a 5,000 ppm SF₆ action trigger.
- As soon as possible, but no later than 15 calendar days following detection, repair the SF₆-insulated high-voltage equipment.

Shell requests that PADEP approve a Plan Approval to address GHG BACT requirements for this source of GHG emissions. Please contact me at 724-709-2411 or jim.sewell@shell.com or Kim Kaal at 724-709-2467 or kimberly.kaal@shell.com if you have any questions or need additional information.

Sincerely,



H. James Sewell
Environmental Manager, Attorney-in-Fact

SHELL CHEMICAL APPALACHIA LLC

SPECIAL POWER OF ATTORNEY

Shell Chemical Appalachia LLC, a Delaware limited liability company (the "Company"), with offices at 910 Louisiana Street, Houston, Texas 77002, hereby appoints and authorizes Jim Sewell, who is managing environmental permitting and other regulatory affairs on behalf of the Company's efforts to construct a petrochemical facility in Beaver County, PA, as its true and lawful Attorney-in-Fact, in the name and on behalf of the Company in connection with Health, Safety, Security and Environment (HSS&E) related activities to:

1. Interface with government agencies;
2. Make binding representations to government agencies;
3. Sign permits, licenses and applications;
4. Sign discharge monitoring reports, routine compliance reports, routine compliance reports, fines, penalties, and other required HSS&E reports; and/or
5. Sign site access agreements not to exceed \$10,000,000.00,

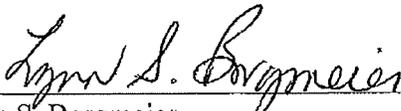
with full power and authority to do and perform every act and deed necessary and proper in the exercise of the forgoing powers as fully as the Company could do by any duly authorized officer, hereby ratifying and confirming all that the said Attorney-in-Fact shall lawfully do or cause to be done by virtue thereof.

This Special Power of Attorney is effective as of June 3, 2015, and shall continue in full force and effect until specifically revoked in writing. The authorities granted by this Special Power of Attorney may not be sub-delegated.

IN WITNESS WHEREOF, the Company has caused this Special Power of Attorney to be signed by its President, sealed with its company seal and attested to by its Secretary.

ATTEST:

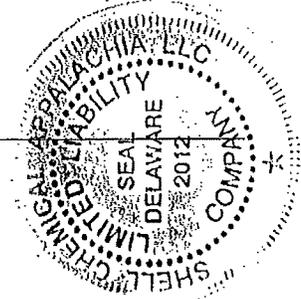
SHELL CHEMICAL APPALACHIA LLC



Lynn S. Borgmeier
Secretary



Ate S. Visser
President



WITNESS:

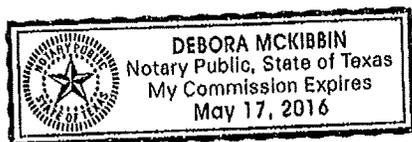
Sylvia Reyes

WITNESS:

Henry Barrett

STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 10th day of June, 2015 by Ate S. Visser, President of Shell Chemical Appalachia LLC, a Delaware limited liability company, on behalf of said company.



Debora McKibbin
Notary Public in and for the State of Texas



Air Quality Plan Approval Application
Petrochemicals Complex Shell
Chemical Appalachia LLC
Beaver County, Pennsylvania

December 2019

Prepared for Submittal to:

Pennsylvania Department of Environmental Protection
Bureau of Air Quality Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Prepared by:



RTP Environmental Associates, Inc.
304-A West Millbrook Rd.
Raleigh, NC 27609

Section 1.0
General Information Form

Form



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)		DEP USE ONLY	
Client ID# _____	APS ID# _____	Date Received & General Notes	
Site ID# _____	Auth ID# _____		
Facility ID# _____			

CLIENT INFORMATION

DEP Client ID#	Client Type / Code		
	LLC		
Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Dun & Bradstreet ID#	
Shell Chemical Appalachia LLC	46-1624986-1		
Individual Last Name	First Name	MI	Suffix SSN
Sewell	H	James	
Additional Individual Last Name	First Name	MI	Suffix SSN
Mailing Address Line 1	Mailing Address Line 2		
300 Frankfort Rd.			
Address Last Line – City	State	ZIP+4	Country
Monaca	PA	15061	
Client Contact Last Name	First Name	MI	Suffix
Sewell	H	James	
Client Contact Title		Phone	Ext
Environmental Manager		(724) 709-2411	
Email Address		FAX	
jim.sewell@shell.com			

SITE INFORMATION

DEP Site ID#	Site Name		
	Shell Chemical Appalachia LLC		
EPA ID#	Estimated Number of Employees to be Present at Site	600	
Description of Site	Petrochemical complex manufacturing ethylene and polyethylene, and cogeneration power plant		
County Name	Municipality	City	Boro Twp State
Beaver	Potter	<input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
County Name	Municipality	City	Boro Twp State
Beaver	Center	<input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
Site Location Line 1	Site Location Line 2		
300 Frankfort Rd.			
Site Location Last Line – City	State	ZIP+4	
Monaca	PA	15061	
Detailed Written Directions to Site	Approximately 30 miles from Pittsburgh, PA on I-376, Exit 30 (PA 18) toward Monaca/Shippingport. Turn left on PA 18S, Frankfort Rd. Turn right on Old Route 18. Turn Left on Frankfort Rd. Site is on left.		
Site Contact Last Name	First Name	MI	Suffix
Sewell	H	James	
Site Contact Title	Site Contact Firm		
Environmental Manager	Shell Chemical Appalachia LLC		
Mailing Address Line 1	Mailing Address Line 2		
300 Frankfort Rd.			

Project Consultant Last Name May	First Name Phil	MI	Suffix
Project Consultant Title Senior Project Manager		Consulting Firm RTP Environmental Associates, Inc.	
Mailing Address Line 1 304-A West Millbrook Rd.		Mailing Address Line 2	
Address Last Line – City Raleigh		State NC	ZIP+4 27609
Phone (919) 929-5551	Ext	FAX	Email Address
Time Schedules	Project Milestone (Optional) N/A		

1. **Have you informed the surrounding community and addressed any concerns prior to submitting the application to the Department?** Yes No
2. **Is your project funded by state or federal grants?** Yes No
Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.
 Aspect of Project Related to Grant _____
 Grant Source: _____
 Grant Contact Person: _____
 Grant Expiration Date: _____
3. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** Yes No
Note: If "No" to Question 3, the application is not subject to the Land Use Policy.
 If "Yes" to Question 3, the application is subject to this policy and the Applicant should answer the additional questions in the Land Use Information section.

LAND USE INFORMATION

- Note:** Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.
1. **Is there an adopted county or multi-county comprehensive plan?** Yes No
 2. **Is there an adopted municipal or multi-municipal comprehensive plan?** Yes No
 3. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** Yes No
Note: If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below.
 If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.
 4. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** Yes No
 If zoning approval has been received, attach documentation.
 5. **Have you attached Municipal and County Land Use Letters for the project?** Yes No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	Is this a coal mining project? If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
1.1	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.2	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.3	Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.4	For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.5	Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.6	Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.0	Is this a non-coal (industrial minerals) mining project? If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
2.1	Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.2	Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

3.0	Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well? If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
3.1	Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.2	Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system? If "Yes", discuss in <i>Project Description</i> .	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.3	Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
4.0	Will the project involve a construction activity that results in earth disturbance? If "Yes", specify the total disturbed acreage. 4.0.1 Total Disturbed Acreage No additional	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
5.0	Does the project involve any of the following? If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0. No additional	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
5.1	Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.2	Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
5.3	Floodplain Projects by the commonwealth, a Political Subdivision of the commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
6.0	Will the project involve discharge of stormwater or wastewater from an industrial activity to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system? No add.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
7.0	Will the project involve the construction and operation of industrial waste treatment facilities? No additional	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
8.0	Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the <i>Project Description</i> , where applicable. 8.0.1 Estimated Proposed Flow (gal/day) No additional	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
9.0	Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system? No additional	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
9.0.1	Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
10.0	Is this project for the beneficial use of biosolids for land application within Pennsylvania? If "Yes" indicate how much (i.e. gallons or dry tons per year). 10.0.1 Gallons Per Year (residential septage) _____ 10.0.2 Dry Tons Per Year (biosolids) _____	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No

11.0	Does the project involve construction, modification or removal of a dam? If "Yes", identify the dam.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
11.0.1	Dam Name				
12.0	Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
12.0.1	Dam Name				
13.0	Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)? If "Yes", identify each type of emission followed by the amount of that emission.	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
13.0.1	Enter all types & amounts of emissions; separate each set with semicolons.	Additional SF6: 75 lb/yr CO2e: 854 tpy			
14.0	Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year? If "Yes", check all proposed sub-facilities.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
14.0.1	Number of Persons Served	No additional			
14.0.2	Number of Employee/Guests				
14.0.3	Number of Connections				
14.0.4	Sub-Fac: Distribution System	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.5	Sub-Fac: Water Treatment Plant	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.6	Sub-Fac: Source	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.7	Sub-Fac: Pump Station	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.8	Sub Fac: Transmission Main	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.9	Sub-Fac: Storage Facility	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
15.0	Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
16.0	Is your project to be served by an existing public water supply? If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
16.0.1	Supplier's Name	Center Township Water Authority			
16.0.2	Letter of Approval from Supplier is Attached	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
17.0	Will this project involve a new or increased drinking water withdrawal from a stream or other water body? If "Yes", should reference both Water Supply and Watershed Management.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
17.0.1	Stream Name				
18.0	Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste? If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
18.0.1	Type & Amount	No additional			
19.0	Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
20.0	Does your project involve installation of a field constructed underground storage tank? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
20.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
21.0	Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
21.0.1	Enter all substances & capacity of each; separate each set with semicolons.				

22.0 Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724? If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. Yes No

22.0.1 Enter all substances & capacity of each; separate each set with semicolons.

23.0 Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons? If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. No additional Yes No

23.0.1 Enter all substances & capacity of each; separate each set with semicolons.

24.0 Will the intended activity involve the use of a radiation source? No additional Yes No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name H. James Sewell

Signature 

Environmental Manager - Attorney-in-Fact

Title

12/16/18
Date

Section 2.0
Compliance Review Form

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

*** Supplemental ***

List only those changes since the date of the last original submission.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
No Changes				

SECTION C. INFORMATION REGARDING APPLICANT & ITS "RELATED PARTIES"

1. Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

*** Supplemental ***

List only those changes since the date of the last original submission.

Unit Name	Street Business	County and Municipality	Telephone No.	Relationship to Applicant
No Changes				

2. General Partners. Provide the names and business addresses of all general partners of the applicant and parent corporation, if any.

*** Supplemental ***

List only those changes since the date of the last original submission.

Name	Business Address
No Changes	

3. Management Responsibility. Provide the names and business of persons with overall management responsibility for the process being permitted (i.e., plant manager).

*** Supplemental ***

List only those changes since the date of the last original submission.

Name	Business Address
No changes	
	[

4. Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time five years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

*** Supplemental ***

List only those changes since the date of the last original submission.

Source	Plan Approval Operating Permit Number	Location	Issuance Date	Expiration Date
No Changes				

SECTION D. COMPLIANCE BACKGROUND

Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.)

1. Documented Conduct. List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

*** Supplemental ***

List only those changes since the date of the last original submission.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status Litigation; Existing/Continuing; or corrected/Date	Dollar Amount Penalty
11/11/19	Shell Polymers Monaca	PA-04-00740A	Installation and operation of SF6-insulated switchgear without authorization	Consent Order and Agreement	Continuing	\$10,000

CONTINUING OBLIGATION: Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional documented conduct occurs or related parties develop between the date of submission and Department action on its application

2. Incidents of Deviation. List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

* * * Supplemental * * *

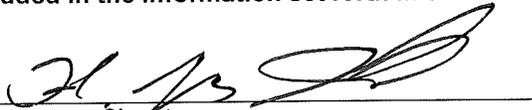
List only those changes since the date of the last original submission.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Existing/Continuing; or Corrected Date
None				

CONTINUING OBLIGATION: Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional documented conduct occur or related parties develop between the date of submission and Department action on its application

VERIFICATION STATEMENT

Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Supplemental Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Supplemental Form.


Signature

12/16/19
Date

H. James Sewell

Name (Print or Type)

Environmental Manager, Attorney-in-Fact

Title

Section 3.0
Processes Plan Approval Application



Submit in Triplicate

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: Shell Chemical Appalachia LLC

DEP Client ID# (if known): 46-1654986-1

Type of Review required and Fees:

- Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: \$ _____
- Source requiring approval under NSPS or NESHAPS or both: \$ _____
- Source requiring approval under NSR regulations: \$ _____
- Source requiring the establishment of a MACT limitation: \$ _____
- Source requiring approval under PSD: \$ 22,700

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- General Information Form (GIF)**
- Processes Plan Approval Application**
- Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: _____
- Copy and Proof of County and Municipal Notifications**
- Permit Fees**
- Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, H. James Sewell, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature):
Name (Print): H. James Sewell

Date: 12/16/19
Title: Environmental Manager, Attorney-in-Fact

OFFICIAL USE ONLY

Application No. _____ Unit ID _____ Site ID _____
DEP Client ID #: _____ APS. ID _____ AUTH. ID _____
Date Received _____ Date Assigned _____ Reviewed By _____
Date of 1st Technical Deficiency _____ Date of 2nd Technical Deficiency _____
Comments: _____

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

SF6-insulated high voltage equipment (gas-insulated switchgear (GIS) and transformers)

Manufacturer Siemens	Model No. 8DN8, 8DA/B	Number of Sources 64
Source Designation	Maximum Capacity 138kV, 34.5kV	Rated Capacity 145kV, 34.5kV

Type of Material Processed

Maximum Operating Schedule

Hours/Day 8760	Days/Week 7	Days/Year 365	Hours/Year 24
Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE) Not Applicable			

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
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Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
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Seasonal variations (Months) From _____ to _____

If variations exist, describe them

2. Fuel - NOT APPLICABLE

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10 ³ Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10 ³ Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10 ⁶ SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10 ⁶ SCF	grain/100 SCF		Btu/SCF
Coal	TPH	Tons	% by wt		Btu/lb
Other * _____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)		
3. Burner - - NOT APPLICABLE		
Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	
4. Process Storage Vessels - - NOT APPLICABLE		
A. For Liquids: - NOT APPLICABLE		
Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter ³)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	
B. For Solids - NOT APPLICABLE		
Type: <input type="checkbox"/> Silo <input type="checkbox"/> Storage Bin <input type="checkbox"/> Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		
5. Request for Confidentiality		
Do you request any information on this application to be treated as "Confidential"? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, include justification for confidentiality. Place such information on separate pages marked "confidential".		

Section B - Processes Information (Continued)

6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.

Main incoming substation (MIS) 138kV (12 bays), Power distribution substation (PDS) 34.5 kV (42 bays), MIS Transformers (4), Gas turbine generator and steam turbine generator step up transformers (5). The equipment will be initially charged with 73,804 lbs of SF6 as an insulator gas. Attachment 1 includes an inventory of equipment.

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.

Emissions will be minimized through inherent equipment design and leak detection and repair (LDAR). Each SF6-insulated compartment is equipped with a pressure indicator that will be monitored and alert the operator when pressure drops below a setpoint level. Additionally, the MIS is equipped with a multi-zone SF6 gas monitor as a safety device to protect site personnel in an enclosed space. The monitoring system uses infrared sensing technology to detect leaks at low levels.

Describe each proposed modification to an existing source.

Not applicable.

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

Each gas compartment is equipped with a fill port to add or withdraw SF6. Each gas compartment is equipped with dedicated pressure relief rupture diaphragms, and where necessary, diverter nozzles to divert a possible overpressure gas discharge away from the normal operating area of the switchgear. Fugitive emissions can occur during initial filling; operating leaks; and periodic recharging following a leak.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

GIS is designed to be gas-tight, and is type tested and designed with a maximum acceptable rate of leakage of 0.1% per year. Transformers are designed with a maximum acceptable rate of leakage of 0.5% per year.

Anticipated Milestones:

- i. Expected commencement date of construction/reconstruction/installation: _____
- ii. Expected completion date of construction/reconstruction/installation: _____
- iii. Anticipated date of start-up: November 12, 2019 (MIS)

Section C - Air Cleaning Device (Continued)			
13. Other Control Equipment			
Equipment Specifications			
Manufacturer DILO	Type Multi-Zone SF6 Gas Monitor	Model No. 3-026-R501-X	
Design Volume (SCFM)		Capacity	
Describe pH monitoring and pH adjustment, if any.			
Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. Not applicable			
Attach efficiency curve and/or other efficiency information.			
Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.			
Operation Parameters			
Volume of gas handled _____ ACFM @ _____ °F _____ % Moisture			
Describe fully giving important parameters and method of operation. 1 ppm display resolution; automatic and manual sampling mode			
Describe the warning/alarm system that protects against operation when unit is not meeting design requirements. Equipped with 3 different ppm level alarms with response time of 315 seconds or less; with 3 indicator lights on display.			
Emissions Data			
Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

14. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost

15. Miscellaneous

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

Not applicable for control of dust. fugitive emissions minimized using density monitoring system.

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

GIS designed with 0.1% or less annual leak rate. Transformers designed with 0.5% or less annual leak rate.

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

No maintenance of gas-tight seals is required. No calibration of the SF6 gas monitoring system is required. Active diagnostics continuously check system for proper operation. Minor periodic maintenance includes replacement of filters. All other maintenance of GIS and transformers in accordance with manufacturer requirements.

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

No.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

- a. Prevention of Significant Deterioration permit (PSD), 40 CFR 52? YES NO
- b. New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E? YES NO
- c. New Source Performance Standards (NSPS), 40 CFR Part 60?
(If Yes, which subpart) _____ YES NO
- d. National Emissions Standards for Hazardous Air Pollutants (NESHAP),
40 CFR Part 61? (If Yes, which subpart) _____ YES NO
- e. Maximum Achievable Control Technology (MACT) 40 CFR Part 63?
(If Yes, which part) _____ YES NO

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

Best Available Control Technology (BACT) Demonstration in Attachment 2

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

Emission Estimates provided in Attachment 1.

Section E - Compliance Demonstration

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

- Monitoring Testing Reporting
 Recordkeeping Work Practice Standard

Monitoring:

- a. Monitoring device type (Parameter, CEM, etc): SF6 density monitors and concentration monitor
- b. Monitoring device location: Each SF6-insulated compartment and MIS building respetcively
- c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Pressure of each SF6-insulated compartment on a continuous basis. Alarms set at low compartment pressure indicating low SF6 density and that a leak has occurred. Concentration of SF6 in MIS building on a continuous basis. Supplemental monitoring with an infrared camera on a quarterly basis.

Testing:

Not applicable

- a. Reference Test Method: Citation
- b. Reference Test Method: Description

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:
 Record pressure gauge inspections monthly, and when density monitoring system or concentration monitor alarm sounds. Record date and time of each alarm, location of detected leak, and date and time of corrective action. Record when any amount of SF6 added to or removed from high voltage equipment.

Reporting:

- a. Describe what is to be reported and frequency of reporting:
 Report each density monitor or concentration monitor system alarm, corrective action, and SF6 added to equipment in accordance with malfunction reporting condition. Semi-annual reporting to begin with Title V Operating Permit. 40 CFR Part 98 Subpart DD equipment and material balance.
- b. Reporting start date: Immediate for alarm and corrective action, and after issuance of TVOP, and March for 40 CFR Part 98 Subpart DD

Work Practice Standard:

Describe each:

State of the art enclosed pressure SF6 circuit breakers equipped with leak detection equipment:
 Alert operator when 10% of SF6 escapes from any breaker;
 Repair leaks ASAP but no later than 15 calendar days after the leak is detected.

Section F - Flue and Air Contaminant Emission						
1. Estimated Atmospheric Emissions*						
Pollutant	Maximum emission rate			Calculation/ Estimation Method		
	specify units	lbs/hr	tons/yr.			
PM						
PM ₁₀						
SO _x						
CO						
NO _x						
VOC						
Others: (e.g., HAPs)	-----	-----	-----	-----		
GHG	CO2e		854		Maximum leak rate of 0.1% and 0.5%	
<p>* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.</p>						
2. Stack and Exhauster Not Applicable						
Stack Designation/Number						
List Source(s) or source ID exhausted to this stack:				% of flow exhausted to stack:		
Stack height above grade (ft.) Grade elevation (ft.)		Stack diameter (ft) or Outlet duct area (sq. ft.)			f. Weather Cap <input type="checkbox"/> YES <input type="checkbox"/> NO	
Distance of discharge to nearest property line (ft.). Locate on topographic map.						
Does stack height meet Good Engineering Practice (GEP)?						
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.						
Location of stack** Latitude/Longitude Point of Origin		Latitude			Longitude	
		Degrees	Minutes	Seconds	Degrees	Minutes
Stack exhaust Volume _____ ACFM Temperature _____ °F Moisture _____ %						
Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.						
Exhauster (attach fan curves) _____ in. of water _____ HP @ _____ RPM.						
** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.						

Section G - Attachments

Number and list all attachments submitted with this application below:

- Attachment 1 - Emissions Estimates
- Attachment 2 - BACT Determination
- Attachment 3 - Vendor Guarantees

ATTACHMENT 1
POTENTIAL EMISSION CALCULATIONS FOR EQUIPMENT

Equipment	Location	SF6 Fill Capacity (lbs)	Nominal Pressure (psig)	Leak Rate (%/yr)	SF6 Max Losses (lbs/yr)	SF6 GWP*	CO2e PTE (tpy)
GIS Breaker Bay 1	MIS Substation	7872	65	0.1	7.872	22800	89.7408
GIS Breaker Bay 2	MIS Substation	7746	65	0.1	7.746	22800	88.3044
GIS Breaker Bay 3	MIS Substation	6022	65	0.1	6.022	22800	68.6508
GIS Breaker Bay 4	MIS Substation	5266	65	0.1	5.266	22800	60.0324
GIS Breaker Bay 5	MIS Substation	5346	65	0.1	5.346	22800	60.9444
GIS Breaker Bay 6	MIS Substation	5266	65	0.1	5.266	22800	60.0324
GIS Breaker Bay 7	MIS Substation	8485	65	0.1	8.485	22800	96.729
GIS Breaker Bay 8	MIS Substation	5346	65	0.1	5.346	22800	60.9444
GIS Breaker Bay 9	MIS Substation	5266	65	0.1	5.266	22800	60.0324
GIS Breaker Bay 10	MIS Substation	6022	65	0.1	6.022	22800	68.6508
GIS Breaker Bay 11	MIS Substation	5266	65	0.1	5.266	22800	60.0324
GIS Breaker Bay 12	MIS Substation	5312	65	0.1	5.312	22800	60.5568
35 kV GIS SWGR	PDS Substation	7.7	21	0.1	0.0077	22800	0.08778
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	12.76	21	0.1	0.01276	22800	0.145464
35 kV GIS SWGR	PDS Substation	11.22	21	0.1	0.01122	22800	0.127908
35 kV GIS SWGR	PDS Substation	7.84	21	0.1	0.00784	22800	0.089376
35 kV GIS SWGR	PDS Substation	12.76	21	0.1	0.01276	22800	0.145464

35 kV GIS SWGR	PDS Substation	2.42	21	0.1	0.00242	22800	0.027588
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	8.14	21	0.1	0.00814	22800	0.092796
35 kV GIS SWGR	PDS Substation	7.52	21	0.1	0.00752	22800	0.085728
35 kV GIS SWGR	PDS Substation	7.7	21	0.1	0.0077	22800	0.08778
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	2.42	21	0.1	0.00242	22800	0.027588
35 kV GIS SWGR	PDS Substation	12.76	21	0.1	0.01276	22800	0.145464
35 kV GIS SWGR	PDS Substation	11.22	21	0.1	0.01122	22800	0.127908
35 kV GIS SWGR	PDS Substation	7.84	21	0.1	0.00784	22800	0.089376
35 kV GIS SWGR	PDS Substation	12.76	21	0.1	0.01276	22800	0.145464
35 kV GIS SWGR	PDS Substation	2.42	21	0.1	0.00242	22800	0.027588
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
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35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	6.82	21	0.1	0.00682	22800	0.077748
35 kV GIS SWGR	PDS Substation	7.7	21	0.1	0.0077	22800	0.08778

MIS Transformer	Outside MIS	30		0.5	0.15	22800	1.71
MIS Transformer	Outside MIS	30		0.5	0.15	22800	1.71
MIS Transformer	Outside MIS	30		0.5	0.15	22800	1.71
MIS Transformer	Outside MIS	30		0.5	0.15	22800	1.71
GTG Step Up Transformer	Cogen	30		0.5	0.15	22800	1.71
GTG Step Up Transformer	Cogen	30		0.5	0.15	22800	1.71
GTG Step Up Transformer	Cogen	30		0.5	0.15	22800	1.71
STG Step Up Transformer	Cogen	30		0.5	0.15	22800	1.71
STG Step Up Transformer	Cogen	30		0.5	0.15	22800	1.71
Total		73804.32			74.88		853.68

*40 CFR Part 98 Subpart A Appendix Table



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

December 11, 2019

Daniel C. Camp III
Chairman, Beaver County Commissioners
Beaver County Courthouse
810 Third St.
Beaver, PA 15009

RE: Shell Chemical Appalachia LLC
Shell Polymers Monaca Site
Potter and Center Townships, Beaver County

Dear Mr. Camp,

The purpose of this notice is to inform you that Shell Chemical Appalachia LLC applied to modify Plan Approval No. 04-00740A to Pennsylvania Department of Environmental Protection (PADEP). This modification includes a supplemental Best Available Control Technology (BACT) analysis for Greenhouse Gas (GHG) emissions from the SF₆-insulated high voltage equipment associated with the cogen area at the site. No other changes to the Plan Approval are being processed concurrently with this revision.

Plan Approval No.: 04-00740A
Project: Petrochemicals Complex
Applicant Name: Shell Chemical Appalachia LLC
Applicant Contact: Jim Sewell
Shell Chemical Appalachia LLC
300 Franklin Rd.
Monaca, PA 15061
(724) 709-2411
Site Location: 300 Franklin Rd., Monaca, Beaver County, PA 15061
Municipality/County: Potter and Center Townships, Beaver County, PA

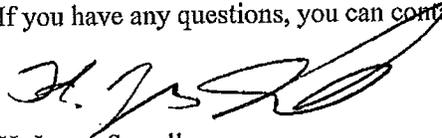
This letter is intended to satisfy the requirement of 25 PA Code Chapter 127, Subchapter B, Plan Approval Requirements §127.43a, Municipal Notifications. Each applicant for a plan approval, "shall notify the local municipality and county where the air pollution source is to be located that the applicant has applied for the plan approval as required by section 1905-A of the Administrative Code of 1929 (71 P.S. § 510.5)."

SF₆-insulated high voltage equipment includes substation switchgear and transformer surge arrestors. This equipment is a potential source of GHG emissions due to the potential for leakage of SF₆ from the gas-tight compartments. The potential for GHG emissions is minimized through low leak design, pressure monitoring, and SF₆ gas monitoring.

A 30-day comment period begins upon receipt of this notice by the municipality and county. If you have comments, you should address those comments to the PADEP, Southwest Regional Office.

Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Dr.
Pittsburgh, PA 15222-4745

If you have any questions, you can contact me at 724-709-2411 or by E-mail at jim.sewell@shell.com.



H. James Sewell
Environmental Manager, Attorney-in-Fact

Shipment Receipt: Page #1 of 1

THIS IS NOT A SHIPPING LABEL. PLEASE SAVE FOR YOUR RECORDS.

SHIP DATE: Wed 11 Dec 2019	SHIPMENT INFORMATION: UPS Ground Commercial 0.05 lb actual wt 1.00 lb billable wt Dims: 12.00x9.00x1.00 in Declared Value = 100.00 USD
EXPECTED DELIVERY DATE: THUR 12 DEC 2019 EOD	
SHIP FROM: SHELL 4301 DUTCH RIDGE RD Beaver PA 15009 (724) 709-2728	Tracking Number: 1z3E682Y0380072769 Shipment ID: MNJSZV04H3XV Ship Ref 1: 12X9X1 DJS 121119 Ship Ref 2: - -
SHIP TO: DANIEL C. CAMP III CHAIRMAN, BEAVER COUNTY COMMISSIONERS 810 3RD ST BEAVER COUNTY COURTHOUSE BEAVER PA 15009-2129 Business	DESCRIPTION OF GOODS: DOCUMENTS
SHIPPED THROUGH: The UPS Store #5820 MONACA, PA 15061-2431 (724) 774-4842	SHIPMENT CHARGES: Ground Commercial 9.99 Service Options 0.00 CMS Processing Fee 0.22
	Total \$10.12

COMPLETE ONLINE TRACKING: Enter this address in your web browser to track: www.ups.com/track (includes Tracking, enter Shipment ID #) SHIPMENT QUESTIONS? Contact SHIPPED THROUGH above.

Shipment ID: MNJSZV04H3XV



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Updated: 12/16/2019 10:43 A.M. EST

Delivered



Delivered On

Thursday
12/12/2019

Delivery Time

at 9:50 A.M.

Send Updates

Delivered To

BEAVER, PA, US

Left At: Receiver

Received By: PANELLA

[Proof of Delivery](#)

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Shipment Progress ^

Overview
Detailed View

		Date	Location
	Delivered	12/12/2019 9:50 A.M.	BEAVER, PA, US
	Out for Delivery	12/12/2019 8:33 A.M.	North Rochester, PA, United States
	Shipped	12/11/2019 10:06 P.M.	North Rochester, PA, United States
	Label Created	12/11/2019 5:43 P.M.	United States

Shipment Details ^

Service
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Ask UPS



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

December 11, 2019

Ms. Rebecca Matsco
Chairwoman, Potter Township Board of Supervisors
300 Mowry Rd.
Monaca, PA 15061

RE: Shell Chemical Appalachia LLC
Shell Polymers Monaca Site
Potter and Center Townships, Beaver County

Dear Ms. Matsco,

The purpose of this notice is to inform you that Shell Chemical Appalachia LLC applied to modify Plan Approval No. 04-00740A to Pennsylvania Department of Environmental Protection (PADEP). This modification includes a supplemental Best Available Control Technology (BACT) analysis for Greenhouse Gas (GHG) emissions from the SF₆-insulated high voltage equipment associated with the cogen area at the site. No other changes to the Plan Approval are being processed concurrently with this revision.

Plan Approval No.: 04-00740A

Project: Petrochemicals Complex

Applicant Name: Shell Chemical Appalachia LLC

Applicant Contact: Jim Sewell
Shell Chemical Appalachia LLC
300 Franklin Rd.
Monaca, PA 15061
(724) 709-2411

Site Location: 300 Franklin Rd., Monaca, Beaver County, PA 15061

Municipality/County Potter and Center Townships, Beaver County, PA

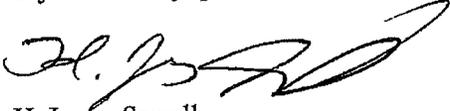
This letter is intended to satisfy the requirement of 25 PA Code Chapter 127, Subchapter B, Plan Approval Requirements §127.43a, Municipal Notifications. Each applicant for a plan approval, "shall notify the local municipality and county where the air pollution source is to be located that the applicant has applied for the plan approval as required by section 1905-A of the Administrative Code of 1929 (71 P.S. § 510.5)."

SF₆-insulated high voltage equipment includes substation switchgear and transformer surge arrestors. This equipment is a potential source of GHG emissions due to the potential for leakage of SF₆ from the gas-tight compartments. The potential for GHG emissions is minimized through low leak design, pressure monitoring, and SF₆ gas monitoring.

A 30-day comment period begins upon receipt of this notice by the municipality and county. If you have comments, you should address those comments to the PADEP, Southwest Regional Office.

Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Dr.
Pittsburgh, PA 15222-4745

If you have any questions, you can contact me at 724-709-2411 or by E-mail at jim.sewell@shell.com.



H. James Sewell
Environmental Manager, Attorney-in-Fact

Shipment Receipt: Page #1 of 1

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SHIP DATE: Thur 12 Dec 2019	SHIPMENT INFORMATION: UPS Ground Residential 0.05 lb actual wt 1.00 lb billable wt Dims: 12.00x9.00x1.00 In
EXPECTED DELIVERY DATE: FRI 13 DEC 2019 EOD	

SHIP FROM: SHELL 4301 DUTCH RIDGE RD Reaver PA 15089 (724) 709-2728	Tracking Number: 1z2EG02Y0346930333 Shipment ID: MNJSZV0UXJ756 Ship Ref 1: 12/12/19 CB 12X9X1 Ship Ref 2: - -
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SHIP TO: POTTER TWP BOARD OF SUPERVISORS MS REBECCA MATSCO 300 MOHRY RD MONACA PA 15061-2226 Residential	DESCRIPTION OF GOODS: LETTER
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SHIPPED THROUGH: The UPS Store #5820 MONACA, PA 15061-2431 (724) 774-4942	SHIPMENT CHARGES: Ground Residential 9.90 Service Options 0.00 CHS Processing Fee 0.22
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Delivered On

Friday
12/13/2019

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Overview	Detailed View
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	Date	Location
	Delivered 12/13/2019 9:45 A.M.	MONACA, PA, US
	Out for Delivery 12/13/2019 8:25 A.M.	North Rochester, PA, United States
	Shipped 12/12/2019 9:56 P.M.	North Rochester, PA, United States
	Label Created 12/12/2019 6:30 P.M.	United States

Shipment Details

Service
UPS Ground  <https://www.ups.com/content/us/en/shipping/time/service/ground.html>

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Ask UPS



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

December 11, 2019

Mr. Bill DiCioccio, Jr.
Chairman, Center Township Board of Supervisors
224 Center Grange Rd.
Aliquippa, PA 15001

RE: Shell Chemical Appalachia LLC
Shell Polymers Monaca Site
Potter and Center Townships, Beaver County

Dear Mr. DiCioccio,

The purpose of this notice is to inform you that Shell Chemical Appalachia LLC applied to modify Plan Approval No. 04-00740A to Pennsylvania Department of Environmental Protection (PADEP). This modification includes a supplemental Best Available Control Technology (BACT) analysis for Greenhouse Gas (GHG) emissions from the SF₆-insulated high voltage equipment associated with the cogen area at the site. No other changes to the Plan Approval are being processed concurrently with this revision.

Plan Approval No.: 04-00740A
Project: Petrochemicals Complex
Applicant Name: Shell Chemical Appalachia LLC
Applicant Contact: Jim Sewell
Shell Chemical Appalachia LLC
300 Franklin Rd.
Monaca, PA 15061
(724) 709-2411
Site Location: 300 Franklin Rd., Monaca, Beaver County, PA 15061
Municipality/County: Potter and Center Townships, Beaver County, PA

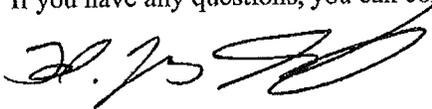
This letter is intended to satisfy the requirement of 25 PA Code Chapter 127, Subchapter B, Plan Approval Requirements §127.43a, Municipal Notifications. Each applicant for a plan approval, "shall notify the local municipality and county where the air pollution source is to be located that the applicant has applied for the plan approval as required by section 1905-A of the Administrative Code of 1929 (71 P.S. § 510.5)."

SF₆-insulated high voltage equipment includes substation switchgear and transformer surge arrestors. This equipment is a potential source of GHG emissions due to the potential for leakage of SF₆ from the gas-tight compartments. The potential for GHG emissions is minimized through low leak design, pressure monitoring, and SF₆ gas monitoring.

A 30-day comment period begins upon receipt of this notice by the municipality and county. If you have comments, you should address those comments to the PADEP, Southwest Regional Office.

Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Dr.
Pittsburgh, PA 15222-4745

If you have any questions, you can contact me at 724-709-2411 or by E-mail at jim.sewell@shell.com.



H. James Sewell
Environmental Manager, Attorney-in-Fact

Shipment Receipt: Page #1 of 1

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Wed 11 Dec 2019

SHIPMENT INFORMATION:
UPS Ground Commercial
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1.00 lb billable wt
Dims: 12.00x9.00x1.00 in
Declared Value = 100.00 USD

EXPECTED DELIVERY DATE:
THUR 12 DEC 2019 EOD

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4301 DUTCH RIDGE RD
Beaver PA 15009
(724) 709-2728

Tracking Number: 1z3E682Y0346741734
Shipment ID: MMJSZVOXB1FVP
Ship Ref 1: 12X9X1 DSJ 121119
Ship Ref 2: - -

SHIP TO:
CENTER TOWNSHIP BOARD OF SUPERVISOR
MR. BILL DI CIOCCIO, JR / CHAIRMAN
224 CENTER GRANGE RD
ALIQUIPPA PA 15001-1498
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Delivered On

Thursday
12/12/2019

Delivery Time

at 1:19 P.M.

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Received By: DELTONDO

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Overview	Detailed View
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		Date	Location
	Delivered	12/12/2019 1:19 P.M.	ALIQUIPPA, PA, US
	Out for Delivery	12/12/2019 8:50 A.M.	North Rochester, PA, United States
	Shipped	12/11/2019 10:06 P.M.	North Rochester, PA, United States
	Label Created	12/11/2019 5:43 P.M.	United States

Shipment Details ^

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ATTACHMENT 2

Introduction

Shell submitted an original plan approval application in May 2014, and a revised application in February 2015. The revised application was deemed complete and a final plan approval was issued by PADEP on June 18, 2015. In the 2014 and 2015 plan approval applications, Shell included general references to SF₆ as a GHG and SF₆ equipment leaks. However, Gas-Insulated Switchgear (GIS) and GIS specifications were not identified in the applications, nor did the applications identify any potential to emit SF₆ from GIS. The plan applications also did not contain a BACT analysis for the SF₆ emissions from the GIS. The GIS were not identified as air contamination sources in Plan Approval No. 04-00740A. This plan approval application addresses the SF₆ containing equipment associated with the G02 Cogeneration Units Emissions Group and provides the GHG BACT for the SF₆-Insulated High Voltage Equipment.

This BACT analysis presented here is for the SF₆-Insulated High Voltage Equipment (*i.e.*, 35 kV and 145 kV) in the Main Incoming Substation (MIS), Power Distribution Substation (PDS), and select power transformers (see listed equipment in Attachment A). Sulfur hexafluoride (SF₆) is commonly used as an insulating medium in high voltage equipment. The components which comprise this equipment are potential sources of fugitive GHG (*i.e.*, SF₆) emissions due to equipment leaks. The full inventory of SF₆ contained in the project's SF₆-Insulated High Voltage Equipment will not exceed 73,804 pounds (37 tons). Based on the licensor's guaranteed leak rates after application of BACT, emissions are estimated at 75 lbs/year, which equates to approximately 0.25% of the authorized annual CO_{2e} emissions for cogeneration units' emissions when adjusted for global warming potential.¹

Summary of Proposed BACT

Based on the analysis contained herein, Shell proposes the following as BACT for the SF₆ emissions from the SF₆-Insulated High Voltage Equipment:

- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.1 percent or less per year for GIS equipment.
- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.5 percent or less per year on transformers.
- Install and operate a density monitor alarm system that will alert the operator when 10 percent (%) of the SF₆ by weight escapes from any SF₆-Insulated High-Voltage Equipment.

¹ (75 lbs/yr)(ton/2000 lbs)(22,800 CO_{2e}/SF₆)/340,558 CO_{2e}(100) = 0.25%

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

- Monitor the SF₆ containing equipment within the MIS building against a 5,000 ppm SF₆ action trigger.
- As soon as possible, but no later than 15 calendar days following detection, repair the SF₆-Insulated High-Voltage Equipment.

BACT Analysis for GHG Emissions from SF₆-Insulated High Voltage Equipment Associated with the Cogeneration Area

This update to the original permit application includes a separate BACT analysis specifically for SF₆ emissions from the SF₆-Insulated High Voltage Equipment. The BACT determination process follows the five-step top-down process as prescribed by the Draft 1990 NSR Workshop Manual, as follows:

1. Identify all potentially available control options.
2. Eliminate technically infeasible control options.
3. Rank the efficiency of the remaining control options.
4. Identify BACT after considering energy, environmental, and economic impacts.
5. Propose as BACT an emissions limitation for a specific pollutant that is appropriate for the selected control method.

The following presents the required BACT analyses for GHG emissions associated with the emissions of GHG from the SF₆-Insulated High Voltage Equipment. Consistent with EPA's policies, the BACT analysis first considers available control technologies that were demonstrated in practice for the SF₆-Insulated High Voltage Equipment associated with the cogeneration area in the 2014-2015 time period (consistent with the completeness determination date and issuance of the final plan approval). Then, in Step 5, Shell considers whether recent advancements in technology would result in a change in the BACT emissions limitation. Notably, none of the conditions for when EPA suggests re-evaluating BACT are present here.² Nevertheless, based on the passage of time, Shell is evaluating whether improvements in the control level are technically and economically reasonable.

Step 1 – Identify Available Control Options

After reviewing PSD permits issued throughout the United States near the 2014-2015 time period, two available options are demonstrated in practice:

² Although Shell filed for a permit extension on February 26, 2019, this extension was not related to a failure to commence construction within 18 months of permit issuance, or for a lapse of 18-months or more of construction as required by 25 Pa. Code §127.13(b). PADEP's regulation require plan approvals contain a term limit. 25 Pa. Code §127.13(a).

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

- Option 1 Enclosed pressure SF₆-Insulated High Voltage Equipment design with low pressure detection system;
- Option 2 Enclosed pressure SF₆-Insulated High Voltage Equipment design with both low pressure detection and density monitoring systems.

In comparison to older SF₆-Insulated High Voltage Equipment, modern equipment is designed as a totally enclosed-pressure system with far lower potential for SF₆ emissions. The general design criteria of BACT level controls is an equipment leak rate not to exceed 0.5% per year. In addition, the effectiveness of gas-tight closed systems can be enhanced by equipping them with a density alarm that provides an alert to the operator of an SF₆ release. The use of an alarm identifies potential leak problems before the bulk of the SF₆ escapes, so that it can be addressed proactively to prevent further release of the gas.

Shell also considered whether an alternative material was available in 2015 to substitute for SF₆ as the dielectric material in the SF₆-Insulated High Voltage Equipment. A report by the National Institute of Standards and Technology (NIST) Technical note 1425, *Gases for Electrical Insulation and Arc Interruption: Possible Present and Future Alternatives to Pure SF₆* addressed the availability of SF₆ alternatives.³ The report concluded that although "...various gas mixtures show considerable promise for use in new equipment, particularly if the equipment is designed specifically for use with a gas mixture...it is clear that a significant amount of research must be performed for any new gas or gas mixture to be used in electrical equipment." The conclusions of the report were further supported by an analysis of the permit precedents for SF₆-Insulated High Voltage Equipment that were issued in 2015. Accordingly, this technology was not demonstrated in practice and was not an available control technology for purposes of this BACT analysis within the specified time period (*i.e.*, June 2015).

Step 2 – Eliminate Technically Infeasible Control Options

Both Option 1 and Option 2 are technically feasible.

Step 3 – Rank the Efficiency of the Remaining Control Options

The top-ranked, technically feasible control strategy for controlling GHG emissions from the SF₆-Insulated High Voltage Equipment is the use of enclosed pressure circuit breaker design with both low pressure detection and density monitoring systems (Option 2). The next most stringent level of control is enclosed pressure circuit design with use of a pressure monitoring system (Option 1).

³ Christophorous, L.G., J.K. Olthoff, and D.S. Green, *Gases for Electrical Insulation and Arc Interruption: Possible Present and Future Alternatives to Pure SF₆*. NIST Technical Note 1425, Nov. 1997. Available at http://www.epa.gov/electricpower-sf6/documents/new_report_final.pdf

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

Step 4 – Identify BACT After Considering Energy, Environmental and Economic Impacts.

SF₆ is a colorless, odorless, non-flammable, and non-toxic synthetic gas. It is a fluorinated compound that has an extremely stable molecular structure. SF₆ is easy to use, exhibits exceptional insulation and arc-interruption properties, and has proven its performance by many years of use and investigation. The unique chemical properties of SF₆ make it the most common and efficient gas for electrical insulation, arc quenching, and current interruption in high-voltage electrical equipment. SF₆ is only used in sealed and safe systems that are designed to not leak gas. In addition, recycling processes are available to recover spent SF₆. No energy or environmental impacts associated with the control options were identified. Shell elected to implement Option 2, the most stringent control option; therefore, Shell did not further consider the cost of control.

Step 5 – Propose Emission Limits Representing BACT

Under the definition of BACT,⁴ equipment design or work practice requirements are acceptable only when technological or economic limitations on the application of measurement methodology would make the imposition of an emissions standard infeasible. That criterion is met with respect to GHG emissions from the high-voltage equipment to be installed at the Shell Polymers Monaca Site, because there are no feasible emissions measurement methodologies applicable to these fugitive emissions.

To determine the appropriate BACT emissions limitation, Shell reviewed BACT determinations for comparable facilities near the relevant time period. These determinations are summarized in Table 1.

Based on BACT determinations from the relevant time period, Shell would propose to implement equipment design standards and work practices as BACT. Specifically, Shell would:

- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.5 percent or less per year.
- Install and operate a density monitor alarm system that will alert the operator when 10 percent (%) of the SF₆ by weight escapes from any SF₆-Insulated High-Voltage Equipment.
- As soon as possible, but no later than 15 calendar days following detection, repair the SF₆-Insulated High Voltage Equipment.

⁴ See 40 CFR 52.21(j)

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

Table 1 GHG BACT Limits for High Voltage Equipment GHG Emissions⁵

Facility (State)	Permit Date	Requirements
Red Gate (TX)	Dec. 2013	<ul style="list-style-type: none"> Equipment design: and low-pressure alarm
Lacey Randall (KS)	Jan. 2014	<ul style="list-style-type: none"> Equipment design: Guaranteed loss rate of 0.5 percent or less per year and equipped with density monitor alarm system
Shady Hills Generating Station (FL)	Feb. 2014	<ul style="list-style-type: none"> Equipment design: Totally enclosed circuit breakers; pressure drop detection system Monitoring: Continuously monitor and record pressure; visually inspect as recommended by manufacturer daily; repair and replace leaking equipment as needed.
Puget Sound Energy Fredonia Generating Station (WA)	Oct. 2013	<ul style="list-style-type: none"> Equipment design: Enclosed-pressure SF₆ circuit breakers. Install leak detection system with an alarm warning when 10% by weight of SF₆ escaped. Limit: 120.1 tpy CO₂e 12-month rolling total based on amount of SF₆ added to the system monthly Monitoring: Log date and time of alarm; repair or replace circuit breaker within 48 hours; or remove SF₆ from the breaker until repaired or replaced; record pounds of SF₆ added to circuit breakers each month.
Sand Hill Energy Center ⁶ (TX)	Sept. 2014	<ul style="list-style-type: none"> Equipment design: Equip with low pressure alarm and low-pressure lockout
El Paso Electric (TX)	March 2014	<ul style="list-style-type: none"> Equipment design: Low pressure alarm and low-pressure lockout. Cap on yearly emissions as calculated using emission factors. Monitoring: Calculate emissions annually using 40 CFR Part 98.
South Texas Electric Cooperative, Inc. Red Gate Power Plant (TX)	Feb. 2015	<ul style="list-style-type: none"> Equipment Design: Low pressure alarm and low-pressure lockout with 1 lb/year detection limit. Cap on yearly emissions as calculated using emission factors. Monitoring: Calculate emissions annually using 40 CFR Part 98.

Shell next considered whether any recent advancements in control technology have occurred. Since the 2014-2015 time period, ongoing research has been aimed at development of alternative, lower GHG dielectric materials that can replace SF₆ and reduce GHG emissions. There are currently three (3) alternative insulator gas products that are potentially available for certain limited applications: GE's g³ ("g cubed" Green Gas for Grid), Siemens' "Clean Air," and ABB's AirPlusTM. A comparative summary of the critical application rating criteria for each of

⁵ The reviewed permits placed BACT restrictions on "circuit breakers." We assume for purposes of this BACT analysis that "circuit breakers" is a general reference for all potential GHG-emitting components in the SF₆-Insulated High Voltage Equipment.

⁶ EPA Region 6 issued a number of GHG PSD permits for Energy Projects from 2012-2015. At least one permit contained no BACT requirements for SF₆-Insulated High Voltage Equipment. The projects included in this chart represent the scope of BACT requirements required in Region 6 permits, so only a few are included as representative of the BACT level of control.

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

the identified alternatives is presented in Table 2. As shown, the alternative insulator gases are currently only rated or demonstrated for high voltage applications up to 145 kV with a short circuit current up to 40 kA on a 3 second basis. These requirements do not meet the specifications for application at the Shell MIS. The SF₆-Insulated High Voltage Equipment required at Shell's MIS must be rated for 145 kV with a short circuit current requirement of 63 kA on a 3 second basis. The Siemens 145 KV, 63 KA SF₆ Switchgear model 8DN8 meets these technical specifications, while there is no comparable product for use with alternative gases.

Table 2. Summary of Alternative Insulator Gas Ratings

Criteria	Shell MIS Equipment	Available Alternate SF ₆ Products		
		GE's g ³	Siemens' Clean Air (GIS only)	ABB's AirPlus™
Product	MIS		VN1	GLK-14
Voltage, kV	145	145	145	170
Normal current, Amps	1,200	2,500	3,150	1,250
Frequency, Hz	60	50/60	50/60	50
Short circuit, kA (3 sec)	63	40	40	40
Short circuit peak withstand current, kA	164	100/108	108	100

The Shell PDS will require equipment with a 40 kA short circuit rating, but the system requires a compact design. The Siemens 35 kV 40 kA 8DA/B SF₆ Switchgear was selected because it met the compact design, safety, and functionality specifications for the project. There is no suitable alternative available for use with alternative gas. Accordingly, the use of alternative gas is not technically feasible for the SF₆-Insulated High Voltage Equipment at the Shell Polymers Monaca Site.

The lower GHG dielectric material cannot be used directly in systems designed for SF₆ without redesigning the system.⁷ EPA does not require reviewing authorities to consider technologies that require a re-design of the source as proposed by the applicant.⁸ Importantly, with respect to the ability of Shell to re-design the MIS or PDS, Shell is not similarly situated to other electrical utilities that might consider use of lower GHG dielectric materials. For safety of the workers at a petrochemical facility, and because of the potential fire hazard, Shell requires that all potential spark ignition sources be housed in an indoor rather than outdoor environments. The Shell Polymers Monaca Site is a brownfield redevelopment site with a limited footprint. To meet the space constraints of the major source's footprint and indoor design constraints, Shell contracted for unique and compactly designed SF₆-Insulated High Voltage Equipment, at a higher cost, to fit within the confines of the MIS and PDS Buildings. The equipment associated with use of

⁷See e.g. "g3 – In the Air," Think Grid, (Dec. 22, 2017)(available at <https://www.think-grid.org/g3-in-the-air>)

⁸ See Letter from Stephen D. Page, Director Office of Air Quality Planning and Standards to Paul Rath, E3 Consulting, LLC, "Best Available Control Technology Requirements for Proposed Coal-Fired Power Plant Projects," (Dec. 13, 2005).

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

lower GHG dielectric material requires a larger plot space than SF₆-Insulated High Voltage Equipment, and as explained above, equipment that can meet the compact design constraints, dictated by the limited footprint of the building and indoor use requirement, are not available in alternative gas designs.

Siemens Electric, who is supplying all of the switchgear for the project, was contacted to determine if lower GHG dielectric material filled transformers were available that would meet Shell's specifications for the Outside MIS and Cogen transformers. Siemens Electric advised Shell that lower GHG dielectric material filled transformers are not currently available. As a result, the use of lower GHG dielectric material filled transformers in the outside MIS and Cogen transformers were removed from consideration.

Shell also considered the more recent BACT determinations presented in Table 3. As shown, none of these BACT determinations are based on or require the use of lower GHG dielectric material. The current BACT emissions limitations are generally consistent with previous BACT emission limitations except in two precedents an additional operator alert is included; when the SF₆ concentration (presumed to be measured within the building that houses the SF₆ containing equipment) reaches 5,000 ppm action is required.⁹ For purposes of this analysis monitoring the SF₆ concentration within a building against an action trigger of 5,000 ppm is considered to be technically feasible.

The gas-insulated substation breaker bays and switchgear are located within two different buildings, the MIS and PDS, respectively. The potential CO₂e emissions associated with the SF₆ containing equipment in each are 834.7 tons and 3.7 tons, respectively. Shell's MIS design includes SF₆ concentration monitors. However, due to the low level of potential SF₆ emissions in the PDS, concentration monitors are not included in the PDS's design. If installation of SF₆ concentration monitors could be accomplished for \$10,000, which is an order of magnitude less than the expected cost of over \$100,000, and if the monitor is assumed to control the full potential to emit, 3.7 tons, the cost effectiveness associated with installation of an SF₆ concentration monitor would be \$250 per ton of CO₂e controlled.¹⁰ This level of cost is considered infeasible and as a result the installation of an SF₆ concentration monitoring system in the PDS is removed from consideration.¹¹

⁹ The MIS will be equipped with a multi-zone SF₆ gas monitor as a safety device to protect site personnel due to the quantity of SF₆ contained within the enclosed space of the MIS. The quantity of SF₆ within the PDS is much lower such that it does not require the same safety device.

¹⁰ \$250/ton = (\$10,000)*(0.094)/250 tons, where 0.094 = capital recovery factor (CRF) based on 20 year life and 7.0% interest rate.

¹¹ This cost is well above the range of cost effectiveness values considered to be reasonable and acceptable in BACT determinations for control of GHG emissions. For example:

- In making the GHG BACT determination for Copano Processing, U.S. EPA determined that control of GHG emissions at a cost of \$54/ton is not BACT because it is "economically prohibitive."

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

The manufacturer of Shell's unique, compact designed SF₆-Insulated High Voltage Equipment, however, are providing a 0.1 percent maximum leak guarantee for the Gas-Insulated Switchgear (GIS) equipment. This reduction in the design leak rate would reduce potential GHG emissions by 294 lbs/year compared with a 0.5 percent design leak rate on the GIS equipment. This represents an improvement in technology compared to existing BACT determinations. Accordingly, Shell proposes to implement an updated, state-of-the-art, equipment design standard and work practices requirements as BACT. Specifically, Shell proposes to:

- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.1 percent or less per year for GIS equipment.
- Install and operate enclosed SF₆-Insulated High-Voltage Equipment having a vendor-guaranteed leak rate of 0.5 percent or less per year on transformers.
- Install and operate a density monitor alarm system that will alert the operator when 10 percent (%) of the SF₆ by weight escapes from any SF₆-Insulated High-Voltage Equipment.
- Monitor the SF₆ containing equipment within the MIS against a 5,000 ppm SF₆ action trigger.
- As soon as possible, but no later than 15 calendar days following detection, repair the SF₆-Insulated High-Voltage Equipment.

These proposed BACT limits are more stringent than any other BACT determination to date for comparable facilities.

-
- In making the GHG BACT determination for the City of Palmdale, U.S. EPA determined that control of GHG emissions at a cost of \$45/ton is not BACT because it is "economically infeasible."
 - In making the GHG BACT determination for Valero's McKee Refinery, U.S. EPA determined that control of GHG emissions at a cost effectiveness of \$134/ton is not BACT.
 - In making the GHG BACT determination for Freeport LNG Development, L.P.'s Freeport LNG Liquefaction Project, U.S. EPA determined that control of GHG emissions from the amine treatment units was cost prohibitive, were the cost effectiveness of the control option under consideration was estimated at approximately at \$14/ton of CO₂ sequestered.

Attachment 2
BACT Analysis for SF₆-Insulated High Voltage Equipment

Table 3. Recent GHG BACT Limits for High Voltage Equipment GHG Emissions¹²

Facility (State)	Permit Date	Requirements
CPV Fairview, LLC (PA)	Sept. 2016	<ul style="list-style-type: none"> • Equipment design: State-of-the-art sealed enclosed-pressure circuit breakers equipped. • Leak detection equipment that: <ul style="list-style-type: none"> ○ Low pressure alarm alerts operator when 10% of the SF₆ by weight has escaped from any breaker. ○ Alerts operator when a leak exceeds 5,000 ppm SF₆. • Action required as soon as possible but no later than 15 calendar days following detection to repair breaker to like new state.
Hilltop Energy, LLC (PA)	Dec. 2017	<ul style="list-style-type: none"> • Equipment design: State-of-the-art sealed enclosed-pressure circuit breakers equipped. • Leak detection equipment that Alerts operator when less than 10% of the SF₆ by weight has escaped from any breaker. • Action required as soon as possible but no later than 15 calendar days following detection to repair breaker to like new state.
Robinson Power Company/ Beech Hollow Energy (PA)	Oct. 2017	<ul style="list-style-type: none"> • Equipment design: State-of-the-art sealed enclosed-pressure circuit breakers equipped. • Leak detection equipment that: <ul style="list-style-type: none"> ○ Low pressure alarm alerts operator when 10% of the SF₆ by weight has escaped from any breaker. ○ Alerts operator when a leak exceeds 5,000 ppm SF₆. • Action required as soon as possible but no later than 15 calendar days following detection to repair breaker to like new state.
Rubart (KS)	Mar. 2016	<ul style="list-style-type: none"> • Equipment design: Guaranteed loss rate of 0.5 percent or less per year and equipped with density monitor alarm system.
Schofield (HI)	Sept. 2016	<ul style="list-style-type: none"> • No limits or requirements.
CPV Three Rivers (IL)	July 2018	<ul style="list-style-type: none"> • Equipment design: 0.5% leak rate calendar year average. • Limit: 14.6 lb/yr 12/month rolling average.
St. Joseph Energy Center, LLC (IN)	Aug. 2018	<ul style="list-style-type: none"> • Equipment design: Certified leak rate less than 0.5% per year.

¹² The reviewed permits placed BACT restrictions on “circuit breakers.” We assume for purposes of this BACT analysis that “circuit breakers” is a general reference for all potential GHG-emitting components in the SF₆-Insulated High Voltage Equipment.

**ATTACHMENT 3
VENDOR DATA**

PROJECT FRANKLIN	
Buyer's Name	Shell Chemical Appalachia LLC
Buyer's Project Name	Project Franklin
Buyer's Project Job Number	25873
Buyer's PO Number	25873-100-POA-ESH0-00001
Buyer's Client Name	Shell Chemical Appalachia LLC
Project Location	Monaca, PA
File Name	E50115-B0469-DS-GIS.pdf
Bechtel Document Number	25873-100-V1A-ESH0-00220
Client Document Number	GM1-7021-U55100-ZV-C08-00002
Equipment/Tag Number	555-ES-101
ECCN Identification	EAR-99
Document Category Code	LA
Seller's Drawing Number	E50115-B0469-DS-GIS
Seller's Revision Number	1
Seller's Title	Switchgear and Circuit Breaker Data Sheet

Project Franklin Bechtel Vendor Print Stamp (OSBL-Used by Bechtel)	
	25873-100-V1A-ESH0-00220
OSBL-Vendor Print Status Code: 1	
<p>Code 1: Work May Proceed Code 2NC: Revise & Resubmit, Work May Proceed Code 2EX: Revise & Resubmit, Work May Proceed; Expedite Return Code 2CR: Revise & Resubmit, Work May Proceed; Priority Return Code 3: Revise & Resubmit, Work May Not Proceed Code 4: Review Not Required, Work May Proceed Permission to proceed does not constitute acceptance or approval of design details, calculation, analyses, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from compliance with contractual obligations.</p>	
Responsible Person: Malesa_George	
Revision: 002	
Date Issued: 02-AUG-2016	
XMTL No: Transmittal 032	
Equipment No:	

Technical Data GIS

Switchgear:	8DN8
Switchgear type	145 kV
Rated voltage	
Rated power frequency withstand voltage (1 min.):	275 kV
- to earth	316 kV
- across the isolating distance	
Rated lightning impulse withstand voltage (1.2/50 µs):	650 kV
- to earth	750 kV
- across the isolating distance	
Permissible partial discharge intensity for cast resin at $1.2xU_r$ kV/ $\sqrt{3}$	≤ 5 pC
Rated normal current:	1200 A
- for busbars and bus coupler	1200 A
- for feeders	63 kA
Rated short-time withstand current, 3 seconds	164 kA
Rated peak withstand current	
Rated frequency	60 Hz
Auxiliary voltages:	125 V DC
- for the motor drive of the disconnecter and earthing switches	-28 to +12 (IEEE) %
- tolerance	125 V DC
- for controlling and signaling	-28 to +12 (IEEE) %
- tolerance	125 V DC
- for remote control	-28 to +12 (IEEE) %
- tolerance	208/120 V AC
- for heating	yes
- potential free signals	
Leakage rate per year (type tested)	< 0.1 %
Humidity of SF ₆ (dew point):	max. -10 °C
- after commissioning	max. -5 °C
- at service conditions	- 30 to + 40 °C
Ambient temperature range	
SF ₆ gas pressures (gauge pressure at 20 °C):	450±10 kPa
- Filling pressure	520 kPa
- Alarm "SF ₆ -pressure rising"	420 kPa
- Alarm "Loss of SF ₆ "	400 kPa
- Alarm "Minimum SF ₆ density"	600 kPa
- Design pressure	1200/780 kPa
- Test pressure (casted / welded enclosures)	845-935 kPa
- Rupture disk operating pressure	≥3000 kPa
- Bursting pressure	
Temperature rise of enclosures at rated current:	
- which have to be touched during normal operation	max.30 K
- which need not be touched during normal operation	max.40 K

Circuit breaker:

Rated normal current:	1200 A
Rated short-time withstand current, 3 seconds	63 kA
No. of interrupter units	1
Rated short-circuit breaking current:	63 kA
- sym.	72,45 kA
- asym. (acc. to IEC: $I_{asym} = I_{sc} \cdot a$)	
Breaking of small inductive currents:	0.5-20 A
- transformer magnetizing current max. overvoltage p.u. ≤ 2.5	
Breaking of capacitive currents:	50 A
- unloaded lines (charging current) at 1.4 p.u.	160 A
- unloaded cables (charging current) at 1.4 p.u.	1.3
First-pole-to-clear factor (acc. to IEC 6227-100)	
Rated operating sequence	O-0.3 sec-CO-3 min-CO (IEC)
Operating times:	
Opening time (20°C)	37±4 ms
Break time (20°C)	54,7 ms
Closing time (20°C)	64±6 ms
Close-open time (20°C)	41±10 ms
Close trip coil	1
Open trip coils	2
Rated Voltage for coils	125 V DC
Voltage tolerance for coils	- 28 bis +12 (IEEE) %
Type of motor-drive	spring drive
Rated Voltage for drive	125 V DC
Voltage tolerance for drive	-28 to +12% (IEEE)
Free contacts	8 NO, 8 NC, 1 wipe contact
Operations counter	resettable
SF ₆ pressures (gauge pressure at 20°C):	560±10 kPa
- Filling pressure	500 kPa
- Minimum pressure	520 kPa
- Alarm "Loss of SF ₆ "	500 kPa
- Alarm "General lock-out SF ₆ "	750 kPa
- Design pressure	1500/1125 kPa
- Test pressure (casted / welded enclosures)	1000-1100 kPa
- Rupture disk operating pressure	≥ 3750 kPa
- Bursting pressure	
For further data see "General description of gas-insulated switchgear"	

Disconnecter- earthing switch:

Rated normal current:	1200 A
Rated short-time withstand current, 3 seconds	63 kA
Max. making capacity (capacitive current)	0.5 A
Max. breaking capacity (capacitive current)	0.5 A
Type of motor-drive	DC-motor
Closing time	≤ 5 s
Opening time	≤ 5 s
Free signalling contacts	7 NO, 7 NC, 1NO make early, 1NC delayed
Bus transfer switching capacity at 30 V	1600 A
For further data see "General description of gas-insulated switchgear"	

Earthing switch:

Rated short-time withstand current, 3 second	63 kA
Type of motor-drive	DC-motor
Closing time	≤ 6 s
Opening time	≤ 6 s
Free signalling contacts	7 NO, 7 NC, 1NO make early, 1NC delayed
For further data see "General description of gas-insulated switchgear"	

Earthing switch, make-proof:

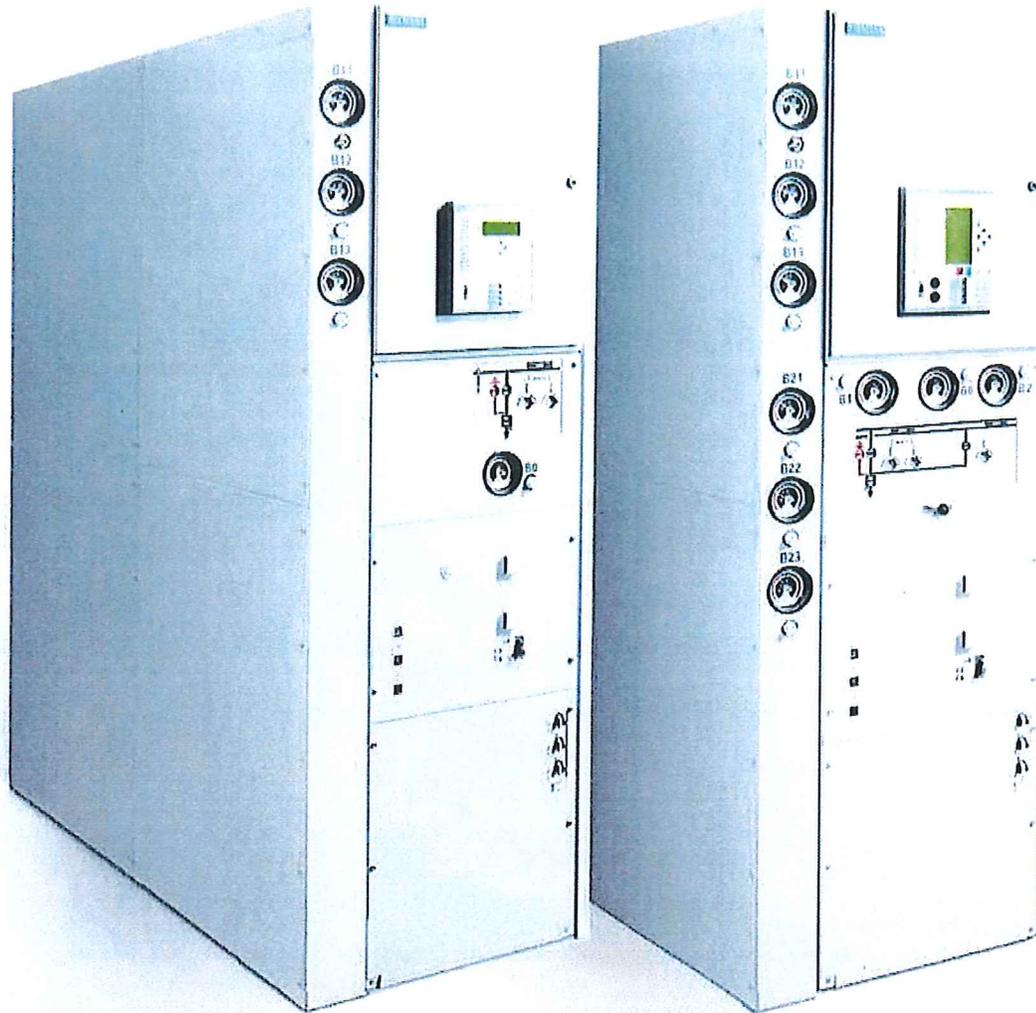
Rated short-time withstand current, 3 seconds	63 kA
Rated peak withstand current	164 kA
Permissible electrical endurance strength of contact	C-O-C
Capacitive breaking capacity (at 9 kV eff.)	2 A
Inductive breaking capacity (at 2 kV eff.)	80 A
Type of motor-drive	DC-motor with spring charge
Charging time of spring mechanism "ON" / "OFF"	≤ 8 / ≤ 10 s
Closing time	≤ 65 ms
Opening time	≤ 8000 ms
Free signaling contacts	7 NO, 7 NC, 1NO make early, 1NC delayed

ANSI

Description	Parameter	
rated maximum kV of circuit breaker in rms kV	Max kV =	170
continuous current rating of the circuit breaker in amperes	Cont Amp =	1200
voltage circuit breaker type as Symmetrical or Total (Sym Rated AC high voltage circuit breaker rated on a symmetrical current basis Total Rated AC high voltage circuit breaker rated on a total current basis	Std. = IEC 62271-100 IEEE Std C37.09 -----	
rated interrupting time for AC high voltage circuit breakers in cycles (E.g. - 5-cycle ac high voltage circuit breakers with 3-cycle Minimum Contact Parting Time)	Cycle = 2.99 cycle acc. to IEEE C37.09	
Contact Parting Time	CPT =	29 ms

time constant for the dc component of asymmetrical capability of a circuit breaker.	Time constant = 45 ms	
rated short-circuit current (rated interrupting capability) at the rated maximum kV in rms kA	Rated Int. =	63 kA
maximum symmetrical interrupting capability in rms kA	Max Int. =	63 kA
closing and latching capability of the high voltage circuit breaker in asymmetrical rms kA. This value should be equal to 1.6 times the maximum interrupting capability.	C&L rms	63 kA_rms 170 kA_peak
closing and latching capability of the high voltage circuit breaker in peak kA. This value should be equal to 2.7 times the maximum interrupting capability.	C&L peak =	170 kA
This field is applicable only for a circuit breaker rated on a symmetrical current basis. The displayed S factor reflects the symmetrically rated, high voltage, circuit breaker's ability to interrupt fault current with dc component. It is defined as the ratio of asymmetrical interrupting rms rating over symmetrical interrupting rms rating of a circuit breaker.	S Factor =	1.2
This field is applicable only for a circuit breaker rated on a symmetrical current basis. The %dc interrupting capability of a circuit breaker is calculated based on the contact parting time and the time constant of dc component.	%dc =	47

SIEMENS



www.siemens.com/medium-voltage-switchgear

Fixed-Mounted Circuit-Breaker Switchgear Type 8DA and 8DB up to 40.5 kV, Gas-Insulated

Medium-Voltage Switchgear · Catalog HA 35.11 · 2012

Answers for infrastructure and cities.

Design

Basic panel design

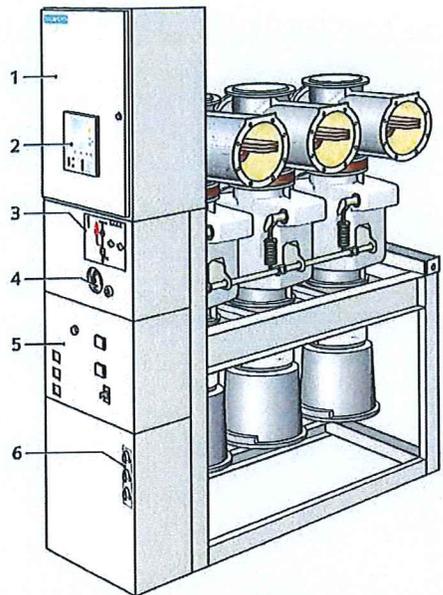
Insulating system

- Switchgear housing filled with SF₆ gas
- Features of SF₆ gas:
 - Non-toxic
 - Odorless and colorless
 - Non-inflammable
 - Chemically neutral
 - Heavier than air
 - Electronegative (high-quality insulator)
- Pressure of the SF₆ gas in the switchgear housing dependent on the electrical ratings (relative pressure at 20 °C):
 - Rated filling level: 70 kPa to 120 kPa
 - Design pressure: 190 kPa
 - Design temperature of the SF₆ gas: 90 °C
 - Operating pressure of bursting disc: ≥ 300 kPa
 - Bursting pressure: ≥ 600 kPa
 - Gas leakage rate: < 0.1 % per year.

Panel design

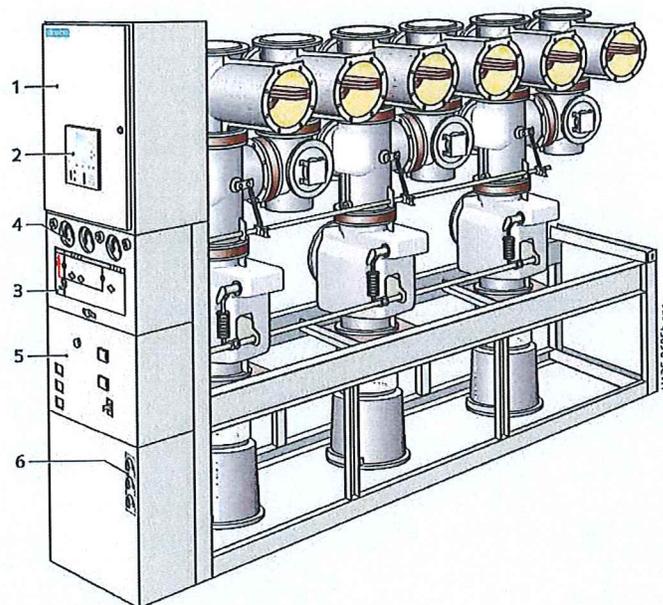
- Factory-assembled, type-tested
- Single-pole metal-enclosed, metal-clad
- Hermetically bolted switchgear housings made of corrosion-resistant aluminum alloy
- Switchpanel poles arranged one behind the other
- Maintenance-free in an indoor environment (IEC 62271-1 and VDE 0671-1)
- Degree of protection
 - IP 65 for all high-voltage parts of the primary circuit
 - IP 3XD for the switchgear enclosure
 - Option: IP 31D for the switchgear enclosure
 - Option: IP 51 for the low-voltage compartment
- Vacuum circuit-breaker
- Three-position disconnecter for disconnecting and earthing
- Make-proof earthing by means of the vacuum circuit-breaker
- Cable connection with inside-cone plug-in system according to EN 50 181
- Wall-standing or free-standing arrangement
- Instrument transformers removable, as they are located outside the gas compartments
- Subframe, front cover, rear cover and end walls powder-coated in color "light basic" (SN 700)
- Low-voltage compartment removable, plug-in bus wires
- Standardized production processes and certified quality and environmental management system according to ISO 9001 and ISO 14001.

Panel design (examples)



8DA10
Panel for single-busbar switchgear

- Legend for 8DA10 and 8DB10**
- 1 Low-voltage compartment
 - 2 Electronic control board, e.g. multifunction protection
 - 3 Operating mechanism and interlock for three-position disconnecter, as well as mechanical position indicators for three-position disconnecter and circuit-breaker
 - 4 Manometer for gas monitoring of feeder gas compartments
 - 5 Circuit-breaker operating mechanism
 - 6 Voltage detecting system



8DB10
Panel for double-busbar switchgear

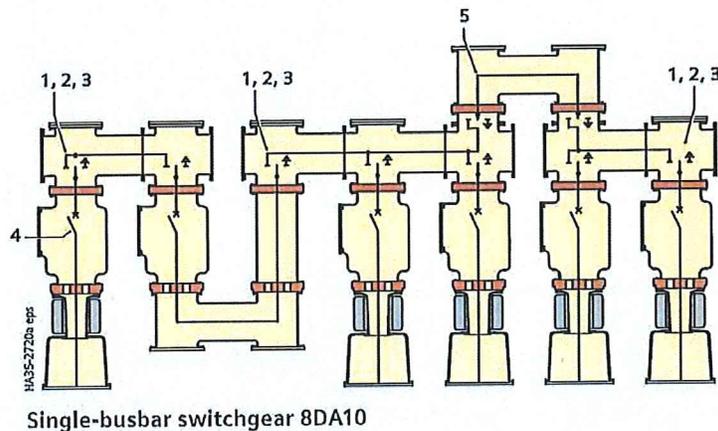
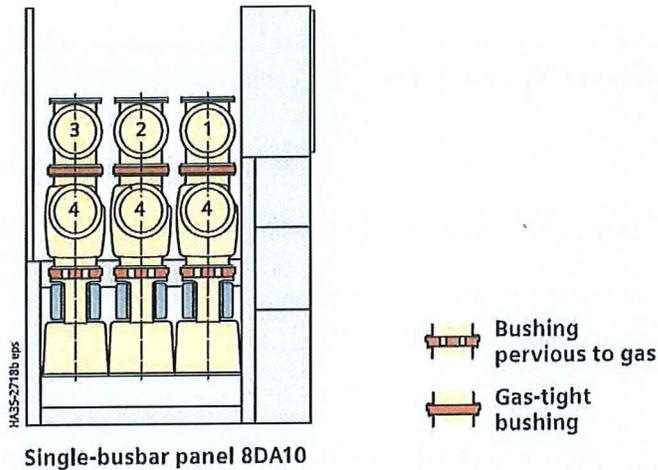
Design

Gas compartment scheme of 8DA10

Gas compartment scheme

- Sealed pressure system (according to IEC 62271-1)
- No refilling required throughout the entire service life
- Gas compartments distributed to several areas
- Gas pressure manometers arranged at the switchgear front
- Gas pressure can be read with security even without auxiliary voltage supply
- SF₆ gas filling equipment with non-return valve arranged at the switchgear front beside the associated gas pressure manometer
- Gas pressure manometers with two signaling contacts for "gas pressure too low / gas pressure too high" indication
- Option: Gas pressure manometers with three signaling contacts for "gas pressure too low / very low" and "gas pressure too high" indication
- Option: Gas pressure manometers with temperature and pressure compensation.

Arrangement of gas compartments in 8DA10



Legend for 8DA10

- 1 Busbar L1 (manometer B11)
- 2 Busbar L2 (manometer B12)
- 3 Busbar L3 (manometer B13)
- 4 Circuit-breaker L1, L2, L3 (manometer B0)
- 5 Top-mounted bus sectionalizer L1, L2, L3 (manometer B16)

3-026-R501-X

Multi-Zone SF₆ Gas Monitor



New to our outstanding line of emission detection units is the 3-026-R501-X Multi-Zone SF₆ Gas Monitor. This device provides continuous detection of SF₆ gas levels in up to 16 separate test zones and can be fitted with an optional two channel 4-20 mA current loop board for connection to remote monitoring equipment. These Multi-Zone monitors retain a log of previous readings that can be easily accessed for analysis. Four relay contacts are provided that can be programmed to trigger external alarm devices in the event of a system fault, or if a small, medium, or large level of gas is detected. Audible and visual front panel indicators show any alarm and fault condition.

With only minor periodic maintenance, such as the occasional replacement of filters and active diagnostics that continuously check the system for proper operation, the 3-026-R501-X will promote safety and help to protect the environment through persistent emission monitoring.



Key Features

- Proprietary infrared sensing technology virtually eliminates false alarms and extends sensor life
- No calibration is ever required
- Low detection limits enable SF₆ gas buildups to be found quickly
- Fastest sampling rate with the longest sampling distance in the industry at 1,200 feet
- Large Graphic LCD for easy set-up and real-time monitoring

Specifications

Display Resolution:	1 ppm
User Interface:	Front panel w/3 indicator lights: Green - Power On, Normal; Yellow - Fault; Yellow Flashing - System Fault; Red/Flashing - point has exceeded alarm set.
Communications:	Full 2-way communication with MZ-RD display module or building management system via RS-485 Serial Interface, RS-232C Comm. Port Standard.
Alarms:	Four SPDT alarm contacts are provided rated 2A @ 250 VAC (Inductive), 5A at 250 VAC (Resistive). Three assigned to ppm level alarms. One assigned to system faults.
Conditioned Signal:	Optional Dual 4-20 mA DC isolated outputs. Channel 1=zone area, Channel 2=ppm
System Noise:	Less than 40dB at 10 Ft. (3m)
Response Time:	5 to 315 seconds – Depending on air line length and number of zones
Sampling Mode:	Automatic or Manual (Hold)
Re-Zero:	Every 5 minutes or on 0.5 Degree C internal temperature change
Monitoring Distance:	Each zone has a 30' radius / 2,825ft ² area
Power Safety Mode:	Fully automatic system reset. All programmed parameters retained
Operating Temp:	32° to 122° F (0 to 50° C)
Ambient Humidity:	5% to 90% RH Non-condensing
Altitude Limit:	6,562 Ft. (2,000 m)
Power:	100 to 240 VAC, 50/60 Hz, 20 W

Dimensions:

Width:	12.5 inches
Height:	14 inches
Depth:	5 inches
Weight:	15 pounds

Shell Chemical Appalachia LLC
PO Box 4913
Houston, TX 77210

0101842 01 RE 0.409 **AUTO H7 1 6239 17105-283333 -P01843 C07



COMMONWEALTH OF PENNSYLVANIA
DEP ENVIRONMENTAL PROTECTION
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COMPANY CODE: UST8
CHECK DATE: 12/12/2019
CLIENT NO.: 0000825382

PAGE 1 OF 1

INVOICE NO.	INV. DATE	REFERENCE	DESCRIPTION	DISC. AMOUNT	NET AMOUNT
20191209SF6	12/09/2019	1900001359		\$0.00	\$22,700.00
				TOTAL:	\$22,700.00



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12/12/2019

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DEP ENVIRONMENTAL PROTECTION
P.O. Box 2833
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AUTHORIZED SIGNATURE

Twenty-two Thousand Seven Hundred and 00/100 Dollars

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