

US EPA ARCHIVE DOCUMENT

Formosa Plastics Corporation, Texas
2012 Expansion Project: Olefins Expansion
GHG BACT Review for Emergency Engines and MSS Activities
December 2013

Emergency Engine GHG BACT Review

Step 1 – Identify Available Control Technologies

Available control technologies for GHG emissions from emergency engines are:

- CCS (carbon capture and sequestration) and
- New, efficient engine design and selection

Step 2 – Eliminate Technically Infeasible Options

The EPA five step top down BACT evaluation for CCS was provided in Appendix C of the permit application. As shown in that analysis, CCS is not commercially available, not technically feasible, and also economically unreasonable. Therefore, CCS is not included as a BACT option for any of the emissions sources associated with the 2012 Expansion Project.

Step 3 – Rank Remaining Control Options

With elimination of CCS, only one control option (new, efficient engine design and selection) remains.

Step 4 – Evaluate the Most Effective Controls and Document Results

With elimination of CCS, only one control option (new, efficient engine design and selection) remains.

Step 5 – Select BACT

Selection of new, efficient emergency engines is BACT for GHGs. The emergency engines are new units and will be subject to NSPS Subpart IIII as indicated in the application. Under this regulation, the engines will be limited to 100 hours per year of operation for testing and maintenance purposes. Compliance with the New Source Performance Standard (Subpart IIII) will inherently demonstrate use of efficient engines. Use of new engines and limiting non-emergency operation hours (via the NSPS) is considered BACT for emergency engines.

Maintenance, Startup and Shutdown (MSS) GHG BACT Review

Step 1 – Identify Available Control Technologies

Per TCEQ BACT requirements, to reduce VOC emissions associated with MSS Activities, gas streams from these activities must be routed to a flare.

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Under the TCEQ NSR permit, FPC TX will be required to perform the following procedures (to satisfy BACT for MSS activities) when preparing to open process equipment to the atmosphere:

- Remove and recover liquid and vapor to the maximum extent practicable,
- Depressure equipment in VOC service to the elevated flare,
- If necessary, purge with nitrogen (to the flare) to reduce the amount of process material remaining in the equipment, and, then
- Open equipment to atmosphere for maintenance, after equipment is purging is completed.

Routing these MSS gas streams to the flare also reduces the amount of methane that would otherwise be emitted directly to the atmosphere. It is not physically possible to capture the combustion products formed by the flare since they are formed in an open flame process. Therefore, there is no available control option to reduce the GHG emissions produced from the flare used to control VOC and GHG emissions from MSS activities.

For MSS emissions associated with opening equipment to the atmosphere, an available control option could include CCS.

Step 2 – Elimination of Technically Infeasible Alternatives

The EPA five step top down BACT evaluation for CCS was provided in Appendix C of the permit application. As shown in that analysis, CCS is not commercially available, not technically feasible, and also economically unreasonable. Furthermore, it is not technically feasible or economically reasonable to collect the small amount of GHG emissions associated with opening the hundreds to thousands of individual pieces of equipment at low pressure to atmosphere. Only small amounts of GHG emissions are expected remain after the TCEQ required procedure is implemented, and these small amounts of GHG emissions are spread throughout a very large plant site. Therefore, CCS is not included as a BACT option for the any of the MSS emissions associated with the 2012 Expansion Project.

Step 3 – Rank Remaining Control Options

With elimination of CCS, only one control option (routing MSS gas streams to the flare) remains.

Step 4 – Evaluate the Most Effective Controls and Document Results

With elimination of CCS, only one control option remains.

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Step 5 – Select BACT

As described earlier, under the TCEQ NSR permit for MSS activities, FPC TX will be required to remove liquid, depressure equipment to the elevated flare, and purge with nitrogen (to the flare) before opening equipment to the atmosphere for maintenance.

Following these procedures for MSS activities will also satisfy BACT for GHG emissions. The TCEQ permit conditions will require demonstration of compliance with these procedures. Therefore, BACT for GHG emissions is satisfied through compliance with the TCEQ NSR permit conditions.