

Renewable Fuels Standard Regulation (RFS2)

Third Party Engineering Review

Prepared For:

Antonio Alberto Stuchi

RCO

Cosan S/A Açúcar e Álcool – Filial Costa Pinto

Piracicaba, São Paulo, Brazil.

Prepared by:

Control Union

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Torre Norte, 7º andar.

São Paulo, Brazil.

Project Nº:

1002-53

Date:

August 17, 2011

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Requirement

According to § 80.1450 (b) from 40 CFR Part 80, this report must meet all applicable items described on § 80.1450 (b)(1) and § 80.1450 (b)(2).

Executive Summary

This report outlines the results of the third party engineering conducted at Cosan S/A Açúcar e Álcool – Filial Costa Pinto to demonstrate compliance with requirements in the Renewable Fuels Standard Regulation (RFS2). The on-site review was conducted by Denilton Silva, auditor of Control Union Certifications, under São Paulo PE license nº04362514 on August 17, 2011. Denilton Silva, a chemical engineer that has over 15 year of experience in various fields of chemical and renewable fuel industries as process, production and project engineering.

Cosan S/A Açúcar e Álcool – Filial Costa Pinto facility located in Piracicaba, São Paulo, started operation on 1936 as supported by internal records. Cosan S/A Açúcar e Álcool – Filial Costa Pinto is a domestic producer of sugar cane ethanol with a renewable fuel production capacity (baseline volume) of 50,192,846 gallons ethanol per year under D-Code 5.

The independent third party engineering review included, but was not limited to, a site walkover, verification of process products and co-products, process energy inputs, feedstock, supplemental plans, baseline volume, construction dates, and applicable permits and contracts. The independent third party engineering review revealed no exception between the registration form, supporting documents, and Cosan S/A Açúcar e Álcool – Filial Costa Pinto facility. It is Control Union Certifications recommendation that Cosan S/A Açúcar e Álcool – Filial Costa Pinto RFS2 registration be approved and accepted.

This report contains no confidential business information (CBI).

1. Professional Licensed Engineer Qualifications

The review was conducted by Denilton Silva, PE independent chemical engineer of São Paulo State license of Conselho Regional de Química N° CRQ-4ª 04362514. A copy of the CRQ card is attached in Appendix A. Denilton Silva is not disbarred, or proposed for suspensions or disbarment.

Denilton Silva has 15 years of experience in the chemical engineering as production, process and project, 4 of which in the renewable fuel industry as process engineering, working at the sugar and ethanol facilities of Destilaria de Álcool São José S/A as a processes engineer.

2. Third Party Independence

To qualify as an independent third party, the professional engineer conducting the engineering review cannot be operated by the renewable fuel producer or any subsidiary or employee of the renewable producer. The professional engineer must also be free of any interest in the fuel producer's business, and equally, the renewable fuel producer must be free of any interest in the professional engineer's business.

Control Union reviewed 40 CFR 80.1450(b)(2)(ii) and has determined that Denilton Silva satisfies the established third party requirements. Control Union is not operated by Cosan S/A Açúcar e Álcool – Filial Costa Pinto or any subsidiary or employee of Cosan S/A Açúcar e Álcool – Filial Costa Pinto and is free of any interest in Cosan S/A Açúcar e Álcool – Filial Costa Pinto business. Additionally Cosan S/A Açúcar e Álcool – Filial Costa Pinto is free of all interest in Control Union business.

3. Verification, Exceptions or Discrepancies

As required by RFS2, the independent PE should review and evaluate the accuracy of all the registration information the renewable fuel producer is required to submit to EPA for registration. The site visit that accompanies the document review was conducted on 08/17/2011. Each registration requirement has been addressed in the engineering report for Cosan S/A Açúcar e Álcool – Filial Costa Pinto.

3.1 Fuel Types

Cosan S/A Açúcar e Álcool – Filial Costa Pinto registered under D-Code 5 Renewable Fuel are capable of producing 50,192,846 gallons ethanol per year. The facility is capable of producing anhydrous and hydrous ethanol. Cosan S/A Açúcar e Álcool – Filial Costa Pinto did not indicate that they intend to produce or are capable of producing any additional fuels without significant modifications to the existing facility. During the site visit Denilton Silva, PE verified this information against construction permits and as a result agrees with this component of RFS2 registration.

3.2 Feedstock, Co-products and Process Heat Fuel

Cosan S/A Açúcar e Álcool – Filial Costa Pinto registered under Feedstock Code 120, Sugarcane. Cosan S/A Açúcar e Álcool – Filial Costa Pinto is not capable of using others feedstock without significant modification to the existing facility. This information was verified by reviewing the process flow diagrams and inspection of processing equipment.

Cosan S/A Açúcar e Álcool – Filial Costa Pinto is not registered under Codes 20, Dry Distillers Grains and 10 Wet Distillers Grains as all of the available co-products codes are only available for grains distillers. During the site visit Denilton Silva, verified Cosan S/A Açúcar e Álcool – Filial Costa Pinto produces as co-products sugar, bagasse, fusel oil, CO₂, vinegar water and sludge coming from the washing of sugarcane and from the juice decanter. Sugar is stored and sold to local and international trading companies. Bagasse is used as a heat process supply and both vinegar water and sludge are used as soil fertilizers in the sugarcane fields. It is Control Union understanding that there are no co-products codes for all the listed co-products. This information was verified by reviewing the process flow diagrams and inspection of processing equipment.

Cosan S/A Açúcar e Álcool – Filial Costa Pinto provided for review a Process Heat Fuel Supply Plan as required by 40 CFR 80.1450 as part of the registration requirements. The plan indicated the bagasse is the only process heat fuel. The total throughput as used for process heat for obtaining ethanol is 317,118,812 BTU/h whereas the steam boiler can produce 1,780,284,126 BTU/h. The total energy used for obtaining ethanol is 18% of the total energy produced. While in site Denilton Silva verified that bagasse is indeed the only significant source of process heat used at Cosan S/A Açúcar e Álcool – Filial Costa Pinto by observation of the process equipment, fuel supply lines, and Piping and Flow Diagram (P&FD). Bagasse is burned and water is heated for steam generation. The generators are moved with steam for electricity production and turbines are moved by the steam generated in the process. The steam is then used to run the distillery.

3.3 Production Process

Under Cosan S/A Açúcar e Álcool – Filial Costa Pinto State Environmental Agency (CETESB) license operating N°21004195 of 05/18/2011 is allowed to operate a fuel grade ethanol production facility based on sugar cane.

Cosan S/A Açúcar e Álcool – Filial Costa Pinto, Piracicaba, São Paulo, Brazil, operates a fuel grade ethanol production facility based on sugarcane milling.

The basis for the production of ethanol is to convert the sugarcane juice into ethanol. Cosan S/A Açúcar e Álcool – Filial Costa Pinto receives sugarcane by truck. The trucks are weighted and sampled for the sugar content analysis, after the sugarcane is then unloaded. The unloaded sugarcane is conveyed for milling in a 6 stage cascaded in counter flow with the juice. The juice is drained and separated from the bagasse. The juices are heated and pH corrected and transferred into a tank for gravity sedimentation. The facility produces 290,590 gal/h of purified juice. The purified juice is pumped to the sugar production plant. The facility produces purified molasses, as co-product of sugar production. Water is added to purified molasses, producing 105,669 gal/h of mixture, the mixture is pumped to the ethanol production plant. At the ethanol plant enzymes are added to the fermenters. After fermentation, the resulting crude wine is first separated in a series of centrifuges. The wet yeast will be used in new fermentation, after suffering a suitable chemical treatment. The separated wine is then sent to five distinct distillation stills trains. Four distillation trains will produce hydrated ethanol at 93.0% weight basis and the other train will produce anhydrous ethanol at 99.3% using brennsolve-dx (Brenntag Química Brasil Ltda.) in order to break the azeotrope mixture. The distillation bottom is acidic water named vinegar water. This vinegar water is then cool at room temperature and pumped to a centralized system for soil fertilization proposes. Bagasse is the fuel for process heating. High pressure steam is used to generate electricity and in the steam driven motors. Low pressure steam is used for process heating. The excess bagasse is stored in piles outside of the plant. The sludge from the juice decanter and from the sugarcane primary washing are concentrated and used as composite soil fertilizer.

3.4 Baseline, Actual Production Volumes

All the permits submitted by the renewable fuel producer to EPA that support the facility's baseline volume were reviewed to verify the facility's baseline volume. The facilities actual operating and air permit, last issued on 05/18/2011, valid until 05/18/2013, by State Environmental Agency (CETESB), states a baseline volume of 50,192,846 gallons of ethanol per year. The permit specifies a capacity of 190,000 cubic meters of ethanol production per year which using the conversion rate of 3.7854 (liter/gallons) gives the total mentioned gallons of ethanol per year. Per 40 CFR80.1403 the permitted capacity is 105% of the permissible volume output of renewable fuel, there for the permitted capacity for Cosan S/A Açúcar e Álcool – Filial Costa Pinto is of 52,702,489 gallons of ethanol per year.

3.5 Items Verified Not To Occur

In addition to the above we would like to point out that the following items were no required as part of the registration materials:

1. The use of separated yard waste, separated food waste or separated municipal solid waste (MSW) was verified no to occur.

During our visit was verified that the above do not occur and agrees with the registration information provided by Cosan S/A Açúcar e Álcool – Filial Costa Pinto to the EPA.

4. Confidential Business Information

This third party engineering review was prepared such that it does not contain confidential business information (CBI).

Conclusion

In conclusion the independent third party review process as conducted by Control Union auditor, Denilton Silva, revealed no exceptions between the registration form, supporting, and the Cosan S/A Açúcar e Álcool – Filial Costa Pinto facility.

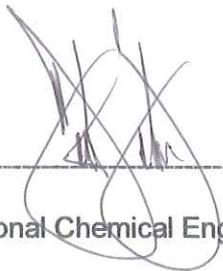
It is Control Union recommendation that Cosan S/A Açúcar e Álcool – Filial Costa Pinto RFS2 registration be approved and accepted.

Denilton Silva

CRQ-4ª Região N°. 04362514

Professional Chemical Engineer's Name

Registration Number



August 17, 2011

Professional Chemical Engineer's Signature

Date

Appendix A

PROFESSIONAL LICENSED ENGINEER DOCUMENTATION

CÉDULA DE IDENTIDADE PROFISSIONAL

REPÚBLICA FEDERATIVA DO BRASIL
CONSELHO FEDERAL DE QUÍMICA
 CONSELHO REGIONAL DE QUÍMICA - IV REGIÃO
 REG. N.º 04382514

SERVIÇO PÚBLICO FEDERAL

NOME: DENILTON DA SILVA

FILIAÇÃO: ANTONIO ROSARIO DA SILVA e JOANA DA SILVA
 (C.F.O.)

RG: 20034724-X SSP/SP DATA EXP: 14/02/08 CPF: 154.603.708-09

NACIONALIDADE: BRASILEIRA DATA DE NASCIMENTO: 02/12/1970

NATURAL DE: SANTO ANDRE, SP

TÍTULO DA HABILITAÇÃO: ENGENHEIRO QUÍMICO

DIPLOMADO PELA(S): UNIV EST DE MARINGÁ

DIPLOMADO EM: 18/03/1996

NAT DO CURRÍCULO: ENGENHARIA DA ÁREA DA QUÍMICA

São Paulo, 02/09/10
 LOCAL E DATA DE EMISSÃO

M. S. Aguiar
 PRESIDENTE DO CRQ

VÁLIDA EM TODO TERRITÓRIO NACIONAL

SERVIÇO PÚBLICO FEDERAL

CÉDULA DE IDENTIDADE de acordo com a RES. NORMATIVA nº 136 de 30/07/2004 C.F.Q.

CONSELHO FEDERAL DE QUÍMICA

PROIBIDO PLASTIFICAR

868.820 N.º

CONSELHO FEDERAL DE QUÍMICA

078898

DE ACORDO COM O ART. 300 DO DECRETO: LEI Nº 5452 DE 01/05/1943 E O ART. 1º DA LEI Nº 8006 DE 07/05/1975 ESTE DOCUMENTO TEM VALOR DE CARTÃO DE IDENTIDADE, SUBSTITUO DIPLOMA E TEM RE PUBLICA EM TODO O TERRITÓRIO NACIONAL.

M. S. Aguiar
 ASSINATURA DO PROFISSIONAL

VÁLIDA EM TODO TERRITÓRIO NACIONAL



UNICAMP

Universidade Estadual de Campinas

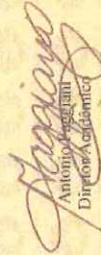
O Reitor da Universidade Estadual de Campinas, no uso de suas atribuições legais, tendo em vista a conclusão em 17-12-2007, do Curso de Mestrado em Engenharia Química, ministrado pela Faculdade de Engenharia Química, reconhecido pela Portaria MEC nº 524 de 29-04-2008, confere o título de

Mestre em Engenharia Química
na área de Ciência e Tecnologia de Materiais a

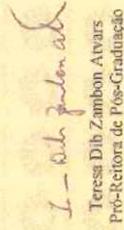
Denilton da Silva

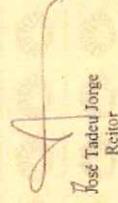
Brasileiro, natural do Estado de São Paulo, nascido a 02 de dezembro de 1970, RG: 20034724-SP de acordo com a defesa de dissertação homologada em 26-08-2008, pela Comissão Central de Pós-Graduação, Deliberação CCPG nº 1448 de 26-08-2008, para constar, manda expedir-lhe o presente diploma.

Cidade Universitária "Zeferino Vaz", 17 de setembro de 2008


Antonio Argentan
Diretor Acadêmico


Denilton da Silva
Diplomado


Teresa Dib Zambon Azevedo
Pró-Reitora de Pós-Graduação


José Tadeu Jorgetti
Reitor

Appendix B

FLOW DIAGRAM

Costa Pinto

