



Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO CERTIFICATE OF APPROVAL
AIR

NUMBER 6925-6REN9E

Notice No. 2

Issue Date: December 5, 2007

PLASCO Trail Road Inc.
1145 Innovation Drive, Suite 100
Kanata, Ontario
K2K 3G8

Site Location: Nepean Landfill Site (Closed)
Part of Lot 9, Concession 4, Rideau Front
Ottawa City, Ontario

You are hereby notified that I have amended Certificate of Approval No. 6925-6REN9E issued on December 1, 2006 for one (1) Energy-From-Waste Demonstration Facility, as follows:

Addition or change of mode of operation of the following equipment in the *Facility*:

- one (1) alternate enclosed flare, as an alternate for twelve (12) months from date of this *Amendment to Certificate*, to the currently approved *CEB Flare* to combust Syngas produced during the start-up and operation of the *Facility* after cooled and cleaned in the GQCS, discharging into the atmosphere through a stack, having an exit diameter of 2.63 metres, extending 13.24 metres above grade; and
- one (1) front end seal pot, installed in the Converter of the Processing Plant, used to vent combustion gases of two (2) propane fired burners, each having a maximum heat input of 4.22 million kilojoules per hour, for keeping the Converter in hot conditions during maintenance of the flares or the GQCS, and the associated residual gases in the Converter and the purging air before the firing of the burners;

all in accordance with Schedule "A" contained in this *Amendment to Certificate*.

For the purpose of this Certificate of Approval (Air) and the terms and conditions specified below, the following definitions, in addition to the definitions contained in the Certificate, apply:

- (1) "*Alternate Flare*" means the one (1) alternate enclosed flare described in the *Company's* application, this *Certificate* and in the supporting documentation submitted with the application, to the extent approved by this *Certificate*.
- (2) "*Amendment to Certificate*" means this amendment to the *Certificate* issued in accordance with section 9 of the *Act*.

(3) "*CEB Flare* " means the one (1) enclosed flare approved in the *Certificate*.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

OPERATION AND MAINTENANCE

1. The *Company* shall ensure that the *Alternate Flare* is properly operated and maintained at all times. The *Company* shall:
 - (1) include, before commencement of operation of the *Alternate Flare*, and update as necessary, in the *Manual* the operating procedures and a maintenance program for the *Alternate Flare*, including:
 - (a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the supplier of the *Alternate Flare*;
 - (b) procedures for any record keeping activities relating to operation and maintenance of the *Alternate Flare*.
2. The *Company* shall not operate the *CEB Flare* and the *Alternate Flare* simultaneously, except during cycling between the *CEB Flare* and the *Alternate Flare*.

MONITORING

3. The *Company* shall monitor the emissions of the *Alternate Flare*, when it is in operation, as follows:

Continuous Emission Monitoring

- (1) The *Company* shall install and maintain operational a *CEM System*, to continuously monitor and record the temperature and the concentrations of carbon monoxide, oxygen, nitrogen oxides, hydrogen chloride, sulphur dioxide and organic matter in the undiluted flue gases leaving the *Alternate Flare* stack, when the *Alternate Flare* is operated. The locations and specifications of the *CEM System* shall be in accordance with Schedule "E" contained in the *Certificate*.
- (2) The *Company* shall, if the concentrations of mercury and particulate matter are not source-tested in accordance with condition 7(4) in the *Certificate*, install and maintain operational a *CEM System* to monitor continuously and to record the concentrations of mercury and particulate matter in the undiluted flue gases leaving the *Alternate Flare* stack, when the *Alternate Flare* is operated.

RECORD MAKING AND RETENTION

4. The *Company* shall make records to record the following in relation to the operation and performance monitoring of the *Alternate Flare* and retain in the *Facility* or another location approved by the Director or *District manager*, for a period not less than five (5) years from the date of their creation:

- (1) all original records produced by the recording devices associated with the *CEM System* ,
- (2) all records on the times and dates when the *Alternate Flare* is operated; and all maintenance works of the *Alternate Flare*.

The *Company* shall make all records required by this *Certificate* available to staff of the *Ministry* for review upon request.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to emphasize that the *Alternate Flare* must be operated and maintained according to a procedure that will result in compliance with the *Act*, the regulations and this *Certificate*.
2. Condition 2 is included to outline the minimum performance requirement considered necessary to prevent an adverse effect resulting from the operation of the *Facility*.
3. Condition 3 is included to require the *Company* to gather accurate information so that the environmental impact and subsequent compliance with the *Act*, the regulations and this *Certificate* can be verified.
4. Condition 4 is included to require the *Company* to prepare records to provide information to the *Ministry* so that the environmental impact and subsequent compliance with the *Act*, the regulations and this *Certificate* can be verified.

SCHEDULE "A"

1. Application for Approval (Air & Noise), dated November 10, 2007 and signed by Ken Campbell, PLASCO Trail Road Inc., and all information associated with the application.
2. Additional information provided by SENES Consultants Limited on behalf of PLASCO Trail Road Inc., as follows:
 - (a) Email sent November 21, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*, with "Questions and Responses" attached.
 - (b) Email sent November 23, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*.
 - (c) Email sent November 24, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*.
 - (d) Email sent November 28, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*, with Memorandum titled "CEM Options at PLASCO" dated November 27, 2007 attached.
 - (e) Email sent November 29, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*, with attachment "Figure CEM Options1.doc".
 - (f) Email sent November 30, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*, with Memorandum titled "Tele Con re final items re JZ Flare CofA" dated November 29, 2007 attached.
 - (g) Email sent November 30, 2007 from Richard Urbanski to Rudolf Wan and Michael Heeringa at the *Ministry*.
 - (h) A CD received by Rudolf Wan of the *Ministry* on December 4, 2007 on the Aermod Input Files for PLASCO JZ Flare backed up.
 - (i) Email sent December 4, 2007 from Richard Urbanski to Rudolf Wan at the *Ministry*, with attachment "Rental Flare Emmissions2.xls".

This Notice shall constitute part of the approval issued under Certificate of Approval No. 6925-6REN9E dated December 1, 2006.

All terms and conditions in the Certificate remain unchanged and are in effect.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted works are approved under Section 9 of the *Environmental Protection Act*.

DATED AT TORONTO this 5th day of December, 2007



Victor Low, P.Eng.
Director
Section 9, *Environmental Protection Act*

RW/

c: District Manager, MOE Ottawa District Office
Richard Urbanski, SENES Consultants Limited

CONTENT COPY OF ORIGINAL



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- one (1) front end seal pot, installed in the Converter of the Processing Plant, used to vent combustion gases of two (2) propane fired burners, each having a maximum heat input of 4.22 million kilojoules per hour, for keeping the Converter in hot conditions during maintenance of the flares or the GQCS, and the associated residual gases in the Converter and the purging air before the firing of the burners;

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(1) include, before commencement of operation of the *Alternate Flare*, and update as necessary, in the Manual the operating procedures and a maintenance program for the *Alternate Flare*, including:

(a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the supplier of the *Alternate Flare*;

(b) procedures for any record keeping activities relating to operation and maintenance of the *Alternate Flare*.

CONTENT COPY OF ORIGINAL

2. The *Company* shall not operate the *CEB Flare* and the *Alternate Flare* simultaneously, except during cycling between the *CEB Flare* and the *Alternate Flare*.

MONITORING

3. The *Company* shall monitor the emissions of the *Alternate Flare*, when it is in operation, as follows:

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3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

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Environmental Review Tribunal
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Toronto, Ontario
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AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

CONTENT COPY OF ORIGINAL

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 5th day of December, 2007

Victor Low, P.Eng.
Director
Section 9, *Environmental Protection Act*

RW/
c: District Manager, MOE Ottawa District Office
Richard Urbanski, SENES Consultants Limited

Pascale Marceau

From: Ken Campbell
Sent: Wednesday, January 02, 2008 11:19 AM
To: Pascale Marceau
Subject: FW: Response to Nov 16 email from Mike

Attachments: 21NOV 07 Response to Rudolf and Mike.doc; ATT55882.txt



21NOV 07 ATT55882.txt
Response to Rudolf (1 KB)

-----Original Message-----

From: Richard Urbanski - SENES Consultants Limited [mailto:rurbanski@senes.ca]
Sent: November 21, 2007 2:28 PM
To: Ken Campbell; Amber Seeds
Subject: Fwd: Response to Nov 16 email from Mike

Ken
This was sent to Rudolf and Mike today..Thanks for your quick response to the fax..
Rich

>Date: Wed, 21 Nov 2007 14:05:53 -0500
>To: Rudolf.Wan@ontario.ca, "Heeringa, Michael (ENE)"
><Michael.Heeringa@ontario.ca>
>From: Richard Urbanski - SENES Consultants Limited <rurbanski@senes.ca>
>Subject: Response to Nov 16 email from Mike
>
>Rudolf, Mike
>
>I have attached a response to the questions that were presented in
>Mike's email of 16 November.
>
>Rudolf I will supply you with the residence time as soon as we receive
>it from the supplier. As well the CEM info will be forthcoming.
>
>Thanks for your continued efforts!
>Rich

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Questions and Responses – pertaining from 16 November 2007 email to Rudolf Wan / Rich Urbanski

To the Attention of: Rudolf Wan and Mike Heeringa
Prepared by: Rich Urbanski
Date: Nov 21 07

1. *Plasco should, where possible, clarify the longer term plans for the rental flare. What is the plan for the rental flare after 3 months?*

~0-3 month: operate as back-up flare - use only for start-up and upsets as described in amendment <74hrs/month Prove out that emissions meet current CofA and regulation; Once emissions, reliability, and performance are acceptable, factor into decision to purchase/order new permanent flare

~ 6 months: delivery of new permanent flare is 4-5 months from PO. Consultation with MOE as to our findings. While we wait and install permanent replacement, we will (as a likely scenario) operate rental flare as main flare with CEMs in place. At that point the original Bekaert flare will be used only as a back-up.

2. *If the rental flare operates 74 hours before the end of a month, will the main flare be operated in its place during start-up?*

Yes, if PLASCO reaches 74hrs of operation with the rental flare, they will go back to the way they are right now with only the Bekaert flare - for everything, including start-ups.

- 3 *While Plasco have indicated there is currently no plan to do so, is it technically possible to run both flares simultaneously?*

Yes, it is technically possible to run both flares and the engines simultaneously. Both flares will run simultaneously for a short duration when the flip between the two flares occurs (~5min).

- 4 *FRONT END SEAL POT*

Are emissions from maintenance activities strictly limited to those from the combustion of propane?

Emissions are strictly limited to those from the combustion of propane and those required to purge the propane combustion train, prior to igniting the burners.

- 5 *How long and how often is GQCS maintenance performed?*

The Bekaert Flare requires maintenance after every processing run. The maintenance cycle for the flare has now decreased to once/week. In other words PLASCO currently needs to use the front-end seal pot to support GQCS maintenance about once/week

- 6 *The application notes gas flows are never diverted away from the flare to the*



PSV at carbon bed: As described above, with the rental flare in place (pilots lit or not), this PSV will never lift unless there is a blockage of syngas flow through the H₂S system. This scenario is not possible due to the multiple layers of interlocks on the H₂S system.

PSV at syngas storage tank: This is simply a token PSV, it will never lift because it is located downstream of the carbon bed PSV. Due to pressure losses across the system, the pressure at the syngas tank is always lower than the pressure at the carbon bed. The only reason this PSV would lift would be due to failure of the carbon bed PSV or due to improper set point calibration... PSVs are on a preventative maintenance program and regularly sent to a relief valve shop for calibration.

Rental Flare: As described above, this is the desired vent location for unburned syngas and will be the point source of most emergency releases. However, it should rarely have to release unburned syngas, it will combust it.

Front End Seal Pot: The front end seal pot will only relieve syngas in the event of a restriction in syngas flow upstream of the syngas blower. The only things that could cause this are a syngas blower failure or a complete and instantaneous plugging of the bag-house (highly unlikely, d/p instruments protect against this).

It is important to note that in all these emergency situations, the process is automatically triggered to go into Emergency Shut Down (ESD), which instantly and significantly reduces the generation of syngas.



SENES Consultants Limited



121 Granton Drive, Unit 12
Richmond Hill, Ontario

Canada L4B 3N4

Tel: (905) 764-9380

Fax: (905) 764-9386

E-mail: senes@senes.ca

Web Site: <http://www.senes.ca>

MEMORANDUM

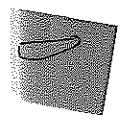
TO: Rudolf Wan, Mike Heeringa
FROM: Rich Urbanski
SUBJ: CEM Options at PLASCO
DATE: 27 November 2007

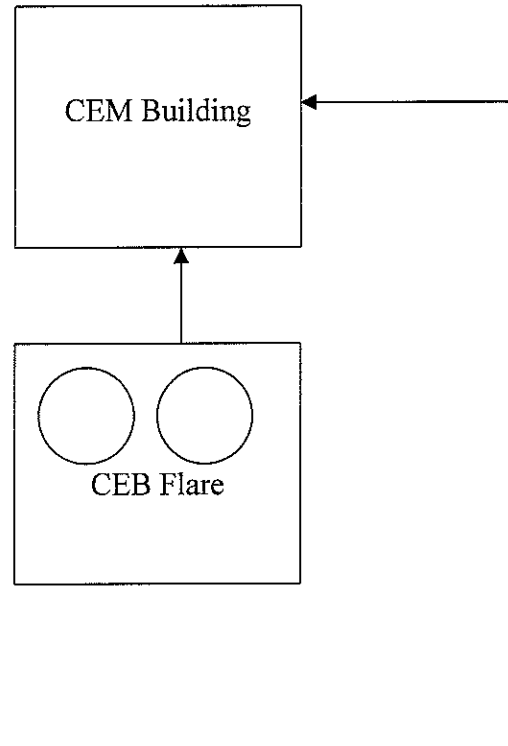
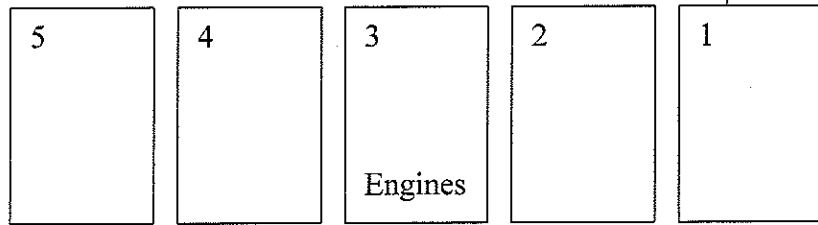
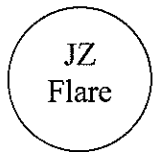
Project Number 34220

The following CEM options have been considered to address the JZ Flare CofA requirements.

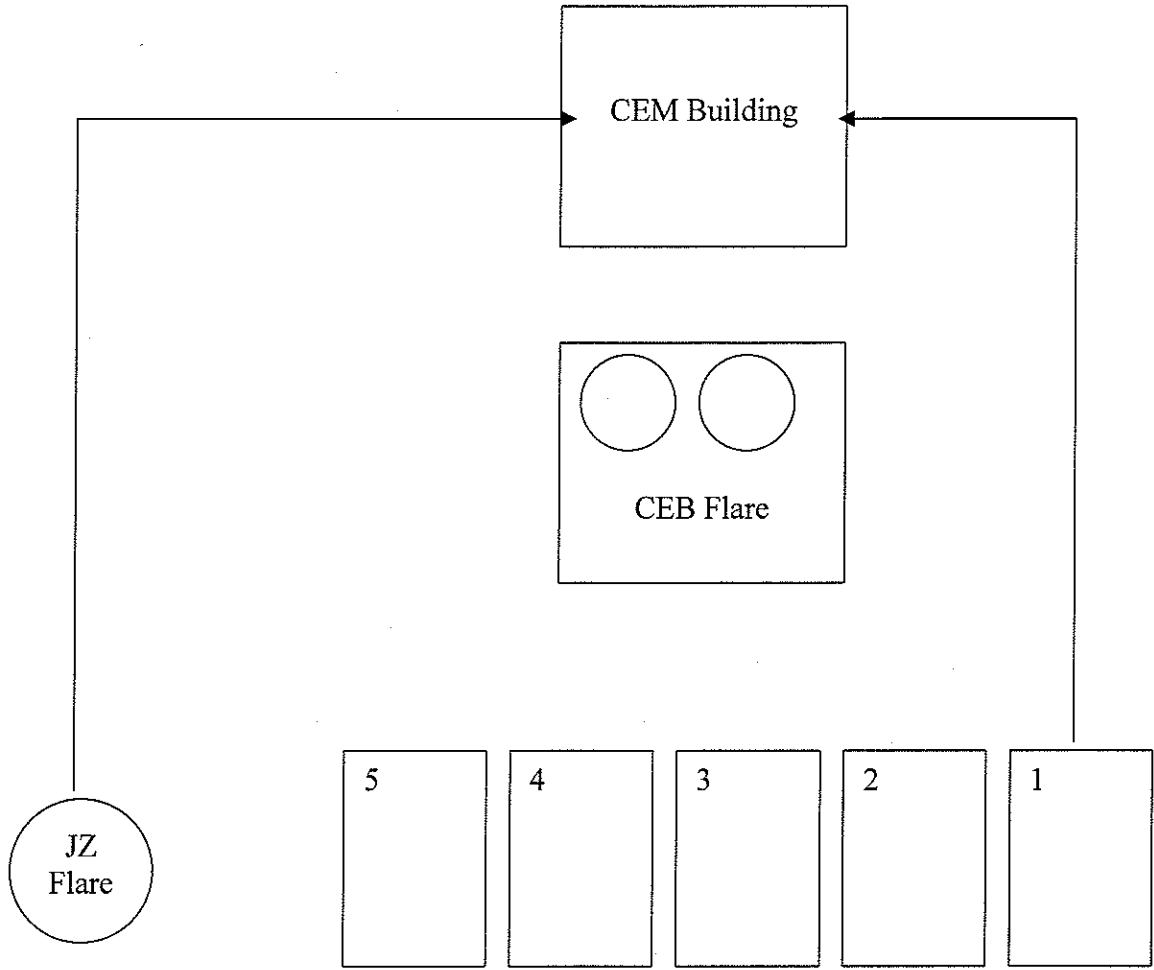
OPTION	CEB FLARE	JZ FLARE	ENGINES	Advantage	Disadvantage	Practicability
1	TRANSFER CEM module to JZ FLARE	Run a 2-3 DAY operational test then transfer back to CEB. Boundaries of process performance can be set.	Retain existing CEM at engines	No major delays in set up and no CEMs acquisition delays	One of flares will use base line data in combination with process parametric data. (1-2 week lag)	Yes Sample module will be physically moved
2	Retain existing CEM set-up	Use sample line from Engines CEM but purchase high temperature front end module	No CEMs – don't operate engines	Order time delay for front end module	Engines are not operational (3 week lag)	No Engine operations required
3	Retain existing CEM	Purchase and run a separate sample line and high temperature module and modify to 3-way time sharing at control cabinet.	Retain CEM at engines	All systems will be monitored	May not be feasible because of system switching logistics (2 month lag per AMKO)	No Equipment delivery time and integration logics are too complex
4	Retain existing CEM	Run a sample line from the JZ to a 3-way valve at the CEB flare	Retain CEM at engines	Straight forward system	Must switch 3 way valve with flare change. (2-3 week lag)	Yes provided that changes are not so frequent as to preclude manual valve operation

Currently PLASCO considers options 1 and 4 as practically feasible. Some downtime will be necessary as indicated. The JZ flare operating time allowance may affect PLASCO's preference.





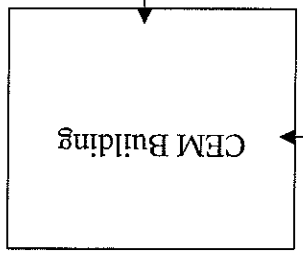
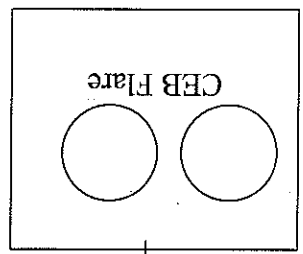
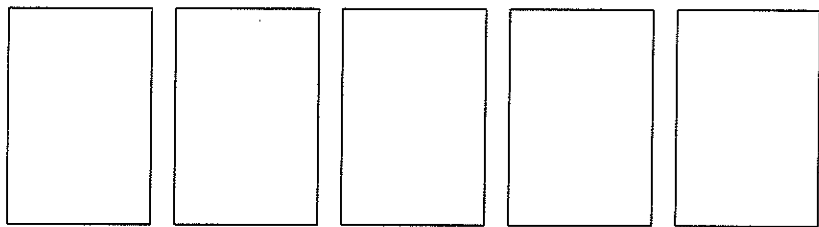
Existing arrangement

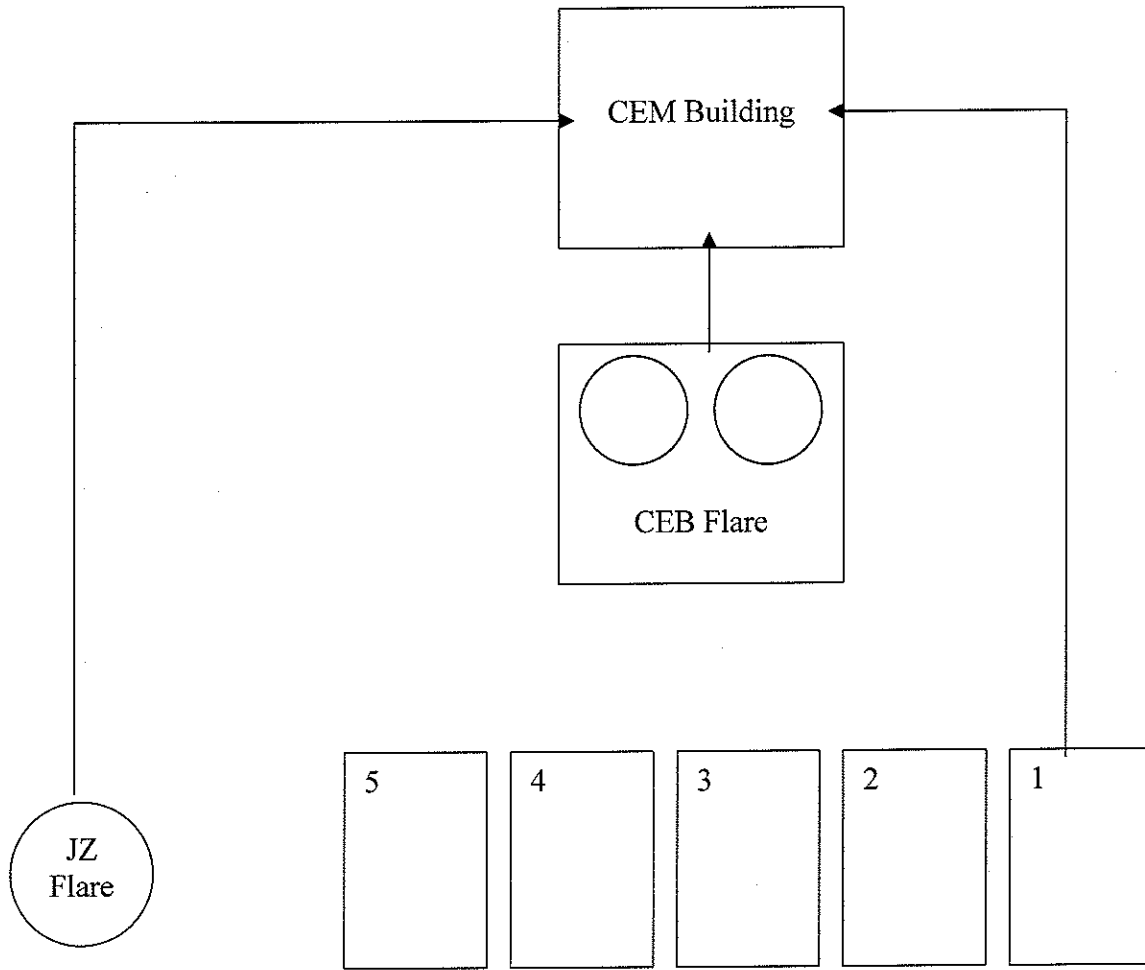


Option 1 – Move CEB module to JZ Flare to establish parametrics

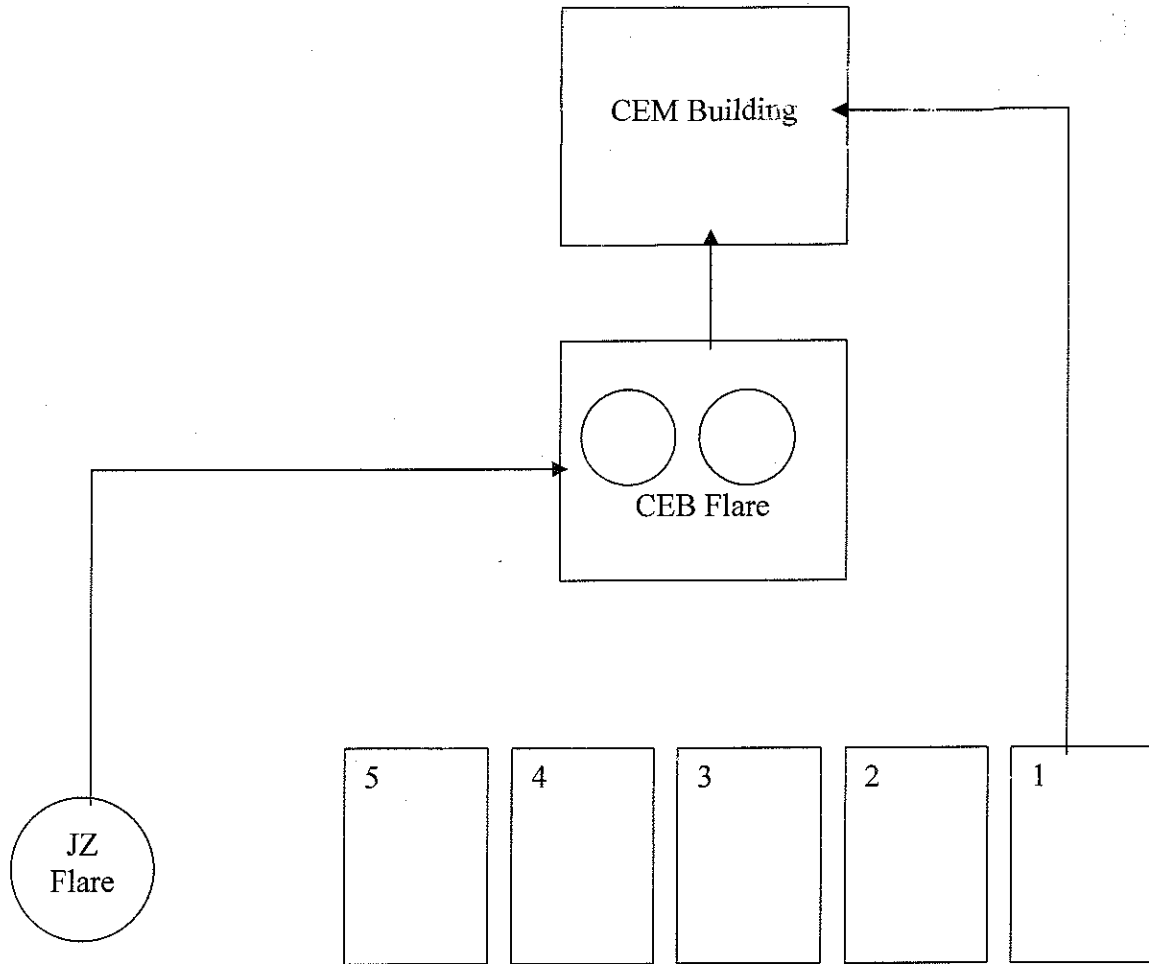


*Option 2 - Move engine
module to JZ Flare*





***Option 3 – Separate lines for
3-way timeshare***



***Option 4 – New sample line from
JZ Flare to 3 – way valve at CEB
Flare***

1

11

11

Pascale Marceau

From: Ken Campbell
Sent: Wednesday, January 02, 2008 11:19 AM
To: Pascale Marceau
Subject: FW: Figure CEM Options.doc

Attachments: Figure CEM Options1.doc; ATT110954.txt



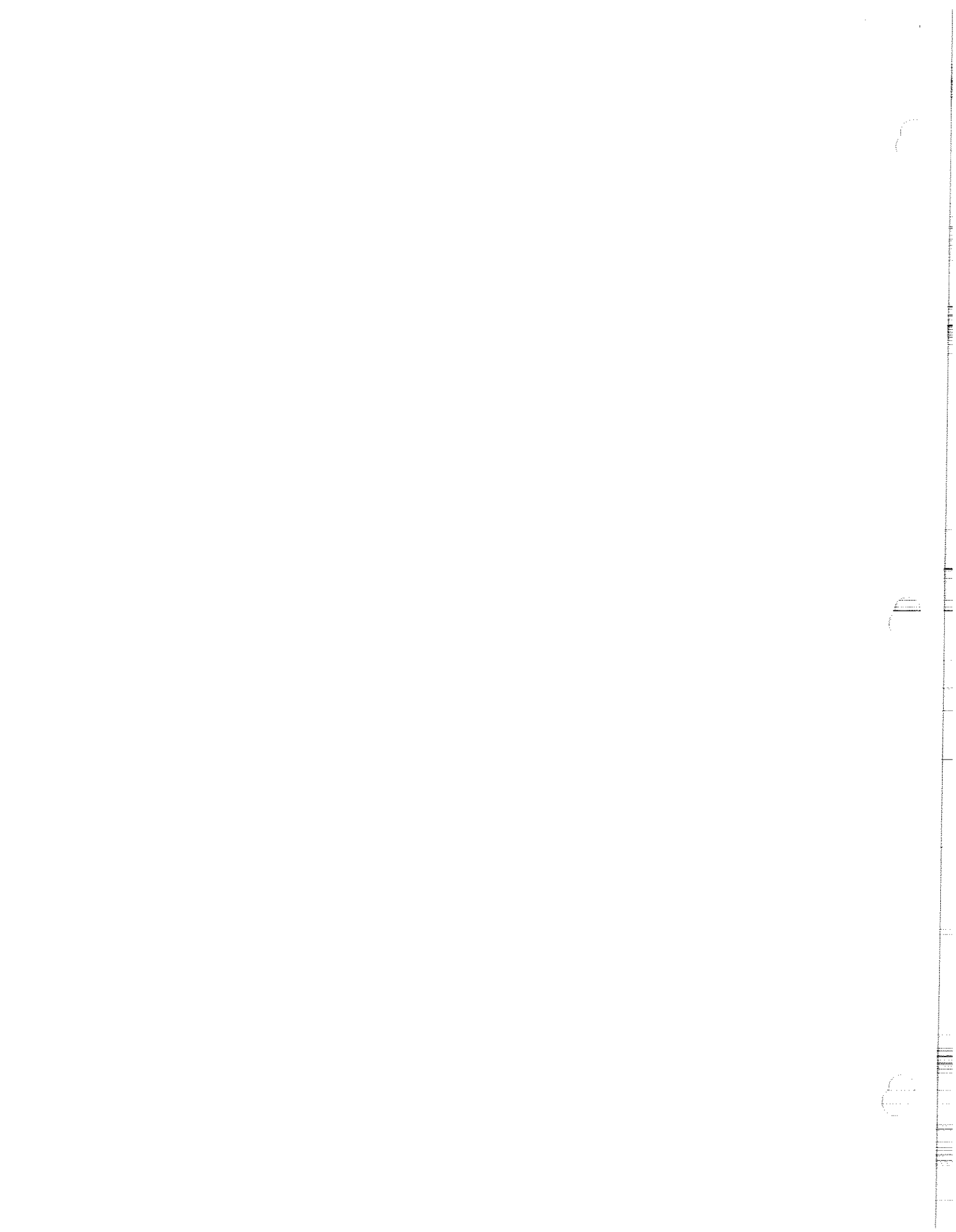
Figure CEM ATT110954.txt
Options1.doc (47 K (1 KB)

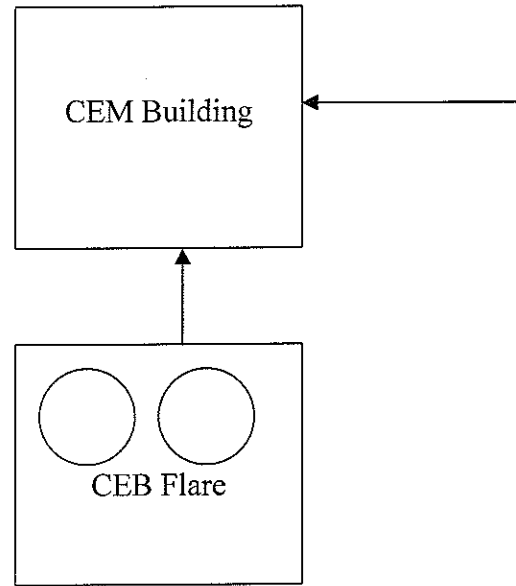
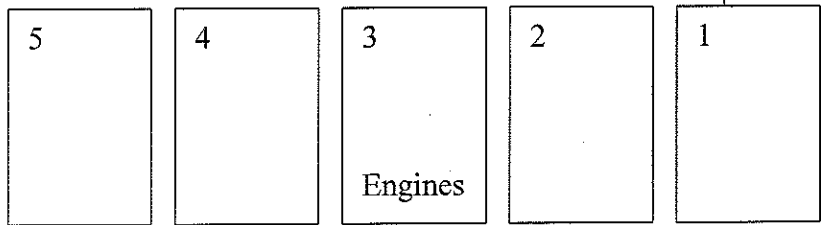
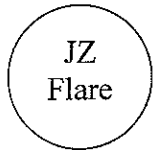
-----Original Message-----

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Sent: November 29, 2007 12:08 PM
To: Ken Campbell
Subject: Fwd: Figure CEM Options.doc

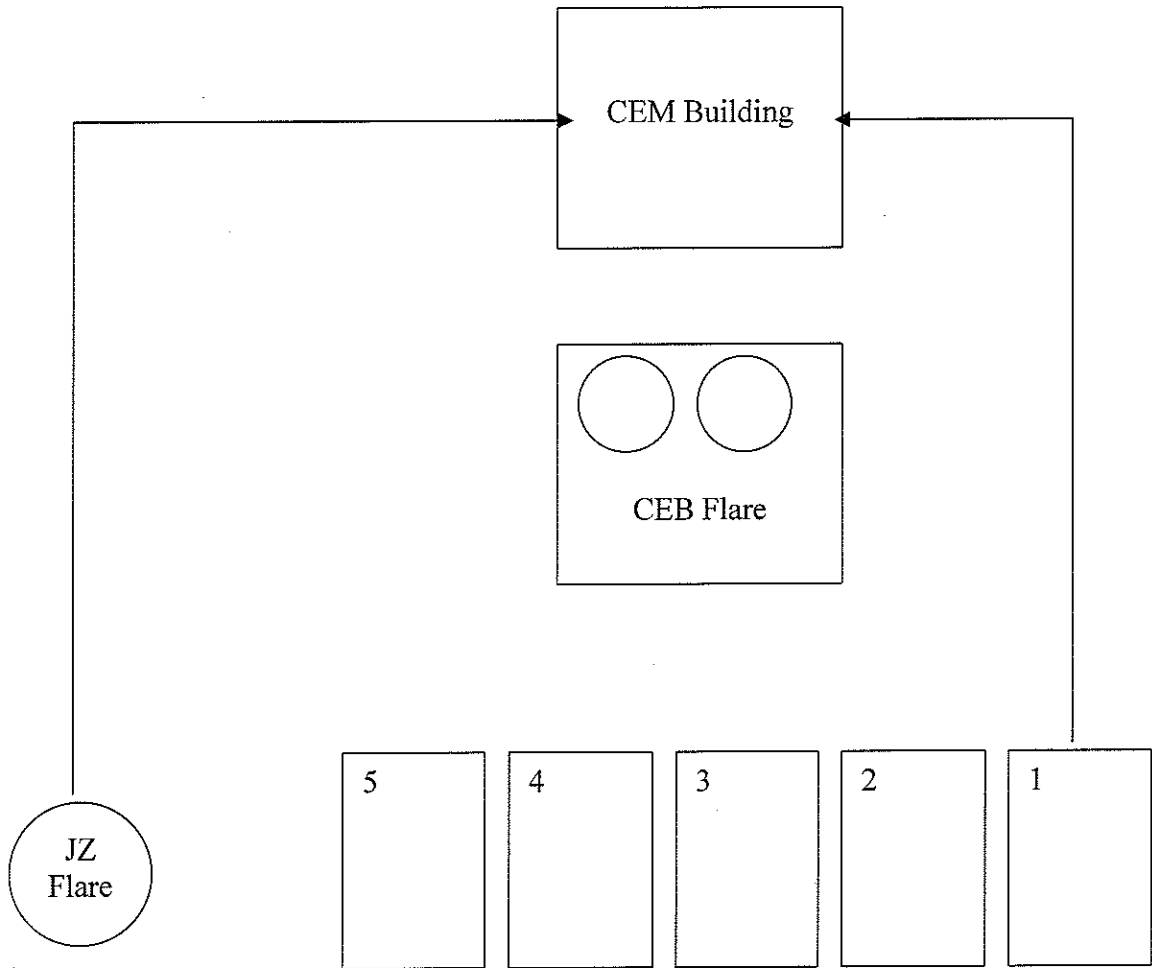
Ken
FYI
Rich

>Date: Thu, 29 Nov 2007 11:54:16 -0500
>To: Rudolf.Wan@ontario.ca, "Heeringa, Michael (ENE)"
><Michael.Heeringa@ontario.ca>
>From: Richard Urbanski - SENES Consultants Limited <rurbanski@senes.ca>
>Subject: Figure CEM Options.doc
>
>Rudolf / Mike
>
>I've attached simplified schematics of the CEM options to which I
>referred in the table. Perhaps they may help during our chat.
>Look forward to our talk at 1:00.
>Rich

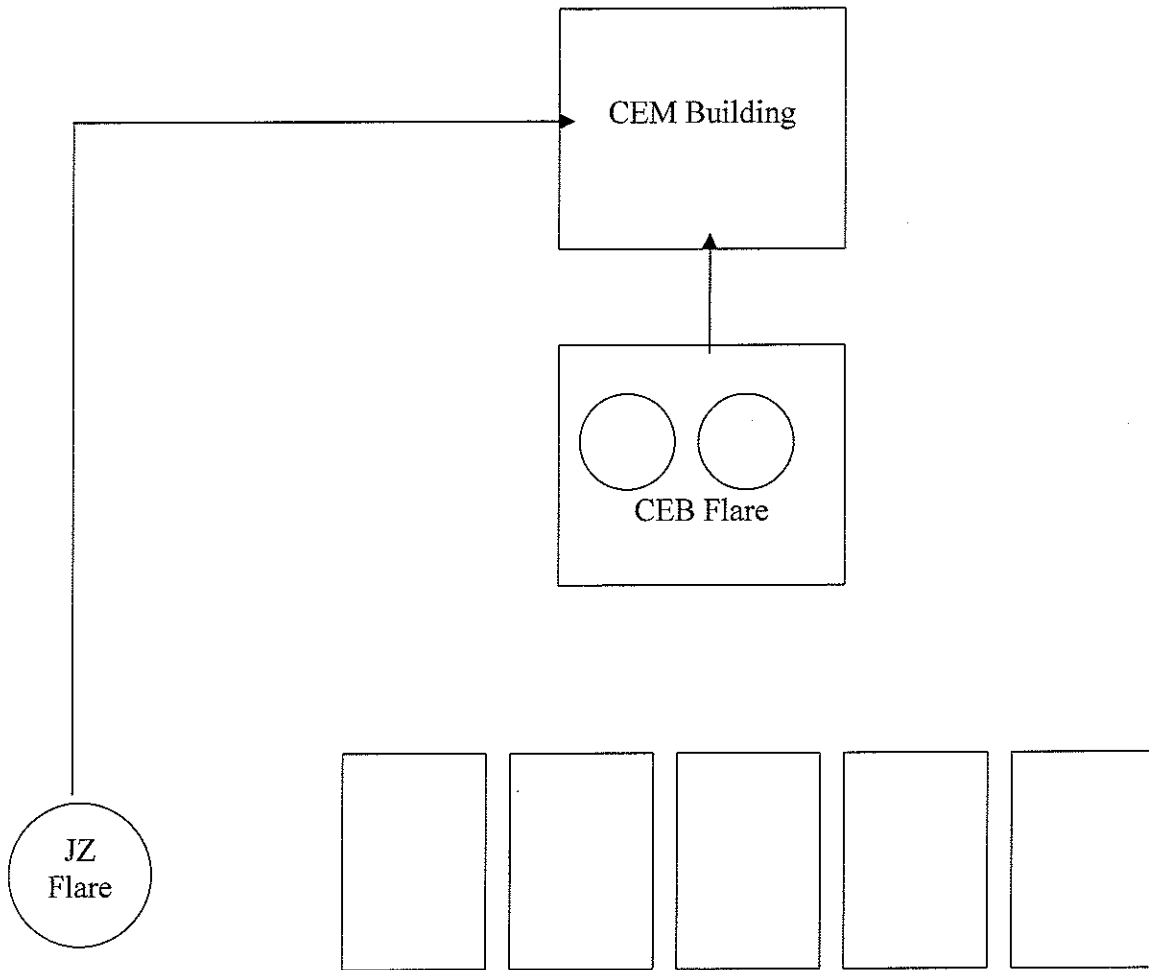




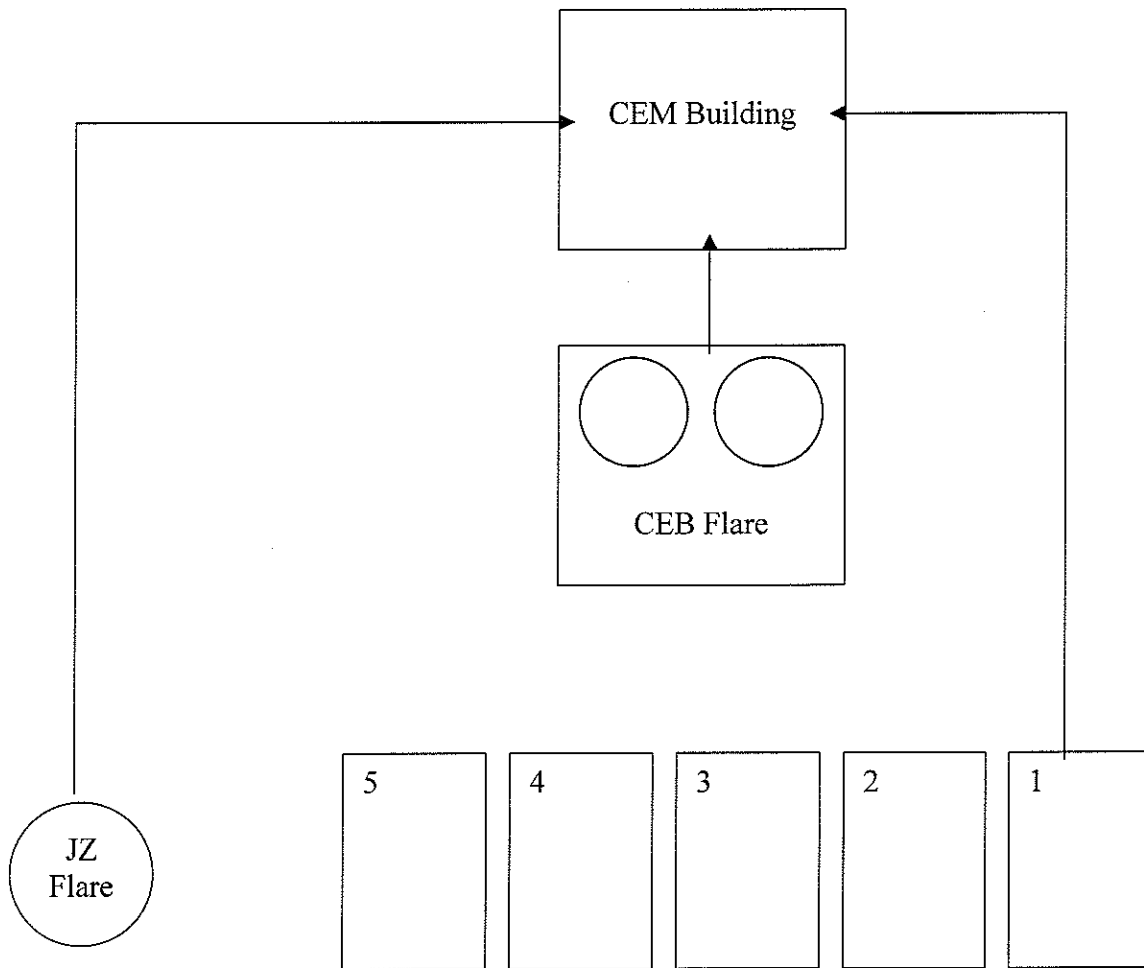
Existing arrangement



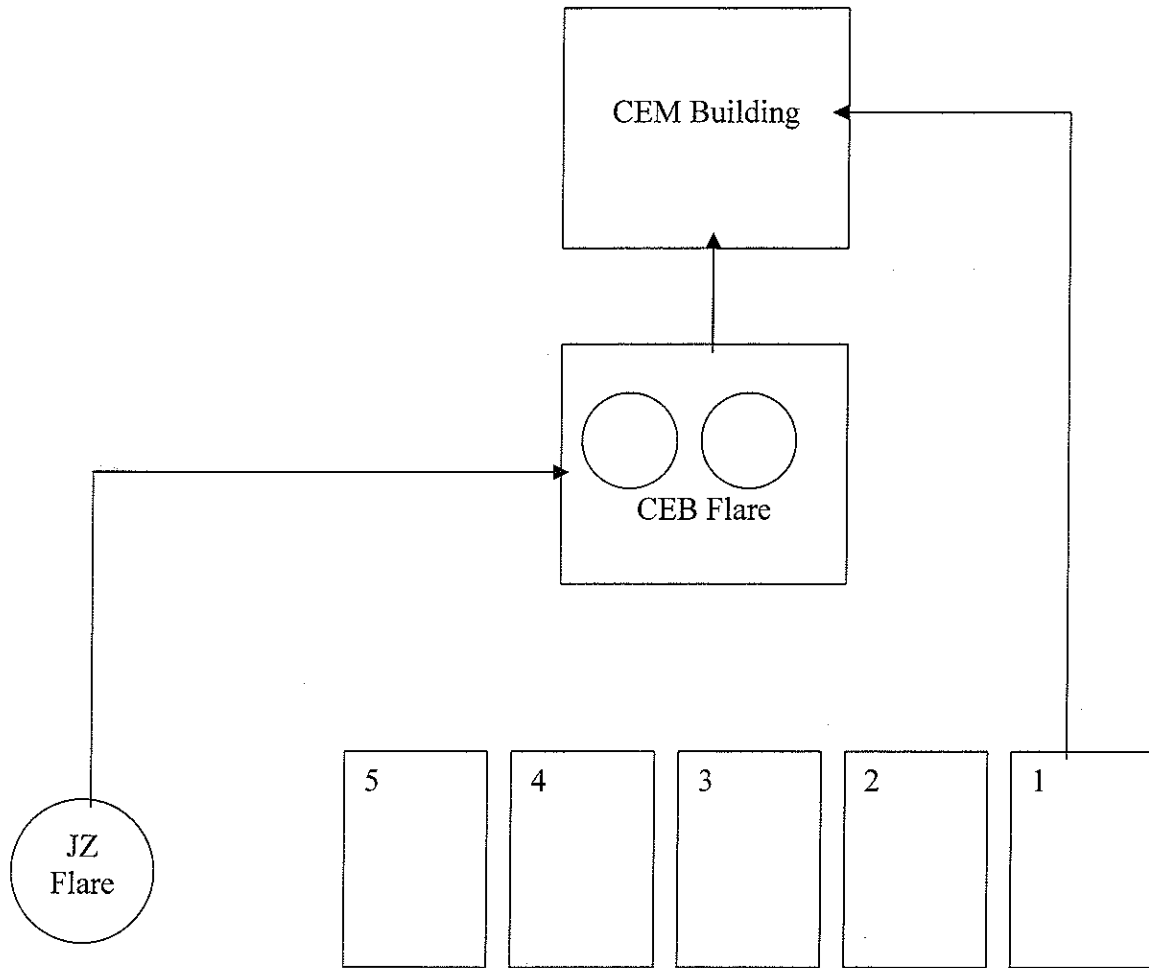
***Option 1 – Move CEB
module to JZ Flare to
establish parametrics***



***Option 2 – Move engine
module to JZ Flare***



***Option 3 – Separate lines for
3-way timeshare***



***Option 4 – New sample line from
JZ Flare to 3 – way valve at CEB
Flare***

C

F

D

Pascale Marceau

From: Ken Campbell
Sent: Wednesday, January 02, 2008 11:19 AM
To: Pascale Marceau
Subject: FW: 34220 30NOV07 CEMJZFLARE Memo r1.doc

Attachments: 34220 30NOV07 CEMJZFLARE Memo r11.doc; ATT116839.txt



34220 ATT116839.txt
7 CEMJZFLARE | (1 KB)

-----Original Message-----

From: Richard Urbanski - SENES Consultants Limited [mailto:rurbanski@senes.ca]
Sent: November 30, 2007 3:33 PM
To: Rudolf.Wan@ontario.ca; Heeringa, Michael (ENE)
Cc: Ken Campbell
Subject: 34220 30NOV07 CEMJZFLARE Memo r1.doc

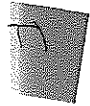
Gentlemen:

I have attached a memo that summarizes our telecon discussion yesterday relating to the final JZ Flare CofA Application items.

We appreciate your input and timely processing of this application.

Please do not hesitate to call if I can be of additional assistance.

Rich



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SENES Consultants Limited



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E-mail: senes@senes.ca

Web Site: <http://www.senes.ca>

MEMORANDUM

TO: Rudolf Wan and Mike Heeringa
FROM: Rich Urbanski
CC: Ken Campbell
SUBJ: Tele Con re final items re JZ Flare CofA
DATE: 29 November 2007

Project Number 34220

This memo confirms the discussion of 29 Nov 07 with Rudolf Wan, Mike Heeringa, and Rich Urbanski. This also confirms that PLASCO will agree with the following listed items.

PLASCO appreciates that the MOE understands the PLASCO purpose to operate a demonstration facility. The need for flare evaluation is in keeping with that purpose. The MOE wants to ensure that emissions are measured continuously while not unduly restricting PLASCO's ability to evaluate the flare nor to incur a restrictive operational delay.

1. The JZ Flare will be allowed to operate as an alternate flare to the current CEB flare in order that PLASCO can evaluate its performance. During this time PLASCO will arrive at a decision about the Bekaert (CEB) Flare.
2. PLASCO will monitor the JZ flare emissions during its operation. The CEM configuration will consist of connecting a CEM sample line from the JZ flare to the sample line at the CEB flare where a 3 - way valve will be activated to direct gas flow from either operating flare to the CEM system.
3. Only one flare can be operated at any time. The duration of usage of a specific flare is according to PLASCO process operating discretion.
4. The JZ flare, which is a rental, will remain on site until such time that a decision is in place regarding the optimum design for a new flare or optimization of the CEB Flare.
5. PLASCO expects the following schedule during the next 10 to 12 months:
 - a. 1 month: install CEMS on rental flare (new cable and sampling probe delivery date ~Dec 11th) - *purpose is 2 fold:*
 - i. 1-4 months - *prove out that emissions meet current CofA and regulation;*
 - ii. 1-4 months - *once emissions, reliability, and performance are acceptable, purchase/order new permanent flare*
 - b. 3 - 6 months: CofA Amendment application then specify and order flare -
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6. When a decision is made – to order a new flare – PLASCO will submit a CofA amendment application in consultation with the MOE.
7. The Original conditions in PLASCO's CofA Air and Noise are still applicable...

Follow-Up Issue

As a further clarification relating to the use of the Front End Seal Pot Vent PLASCO has advised that the following venting activation sequence is applied:

- a. The flow of Syngas is stopped (i.e. process air is stopped)
- b. The converter and GQCS is purged with nitrogen, while all remaining feedstock is removed from the converter (rams continue to operate)
- c. Gases, including the nitrogen purge, continue to flow through the GQCS until the back end process H₂ and CO monitors (1% accuracy) read non-detect.
- d. Upon such confirmation the seal pot vent is opened (drained).
- e. Burners are ignited. The burner ignition sequence starts with an air purge of the converter

Rich

Pascale Marceau

From: Richard Urbanski - SENES Consultants Limited [rurbanski@senes.ca]
Sent: Thursday, January 03, 2008 4:53 PM
To: Pascale Marceau
Subject: Doc Control Air CofA Flare Amendment Nov 23 email to Rudolf and Mike

Re: Nov 23, 2007 email:

Date: Fri, 23 Nov 2007 17:09:12 -0500
To: "Wan, Rudolf (ENE)" <Rudolf.Wan@ontario.ca>, "Heeringa, Michael (ENE)" <Michael.Heeringa@ontario.ca>
From: Richard Urbanski - SENES Consultants Limited <rurbanski@senes.ca>
Subject: RE: Response to Nov 16 email from Mike

Rudolf / Mike

I received the following information from PLASCO:

"TSSA guidelines require us to purge the combustion train before we light the burners

The duration of the purge depends upon the temperature of the converter at the time of ignition. In all cases we purge with air before we light the burners. The purge is intended to account for any possibility that the propane control valves to the burners may inadvertently leak uncombusted propane into the converter.

Purge duration is 16 minutes (with air) if the converter is cold and is 2 seconds if the converter is above 760C (i.e. if we light burners at the end of a run).

In other words, we exhaust up to 16 minutes of air through the front end seal pot when we restart from cool conditions."

As far as the actual down time for maintenance/inspection I suspect it is of sufficient time to allow a visual inspection. If there is a substantive maintenance effort/ requirement discovered during this inspection the converter will be allowed to cool down.

Hopefully this explanation helps!

Rich

At 03:53 PM 11/23/2007, you wrote:

Rich:

Please note that Mike has some follow-up questions to your response of November 21 as follows:

Regarding the Front End Seal Pot, Plasco should clarify what is meant by

"Emissions are strictly limited to those from the combustion of propane and those required to purge the propane combustion train, prior to igniting the burners".

- What are the anticipated emissions during the purging period if not limited to the by-products from the combustion of propane?
- Will residual, untreated Syngas be allowed to vent prior to igniting the propane burners?
- What is the anticipated duration of the purging procedure and the entire maintenance procedure?

We will get back to you regarding CEM requirement of the rental flare.

Thanks. Please contact us if you have any further questions.

Rudolf Wan, P.Eng.
Senior Air Engineer, Air & Noise Unit
Certificate of Approval Review Section
Environmental Assessment and Approvals Branch
Ontario Ministry of the Environment
Tel: (416) 314-7784; Fax: (416) 314-8452
Email: rudolf.wan@ontario.ca

-----Original Message-----

From: Richard Urbanski - SENES Consultants Limited
[mailto:rurbanski@senes.ca]
Sent: November 21, 2007 2:06 PM
To: Wan, Rudolf (ENE); Heeringa, Michael (ENE)
Subject: Response to Nov 16 email from Mike

Rudolf, Mike

I have attached a response to the questions that were presented in Mike's email of 16 November.

Rudolf I will supply you with the residence time as soon as we receive it from the supplier. As well the CEM info will be forthcoming.

Thanks for your continued efforts!
Rich

Richard Urbanski, MBA CHRP
Senior Air Quality Specialist

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121 Granton Drive, Unit 12
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Cell: (416) 893-0358

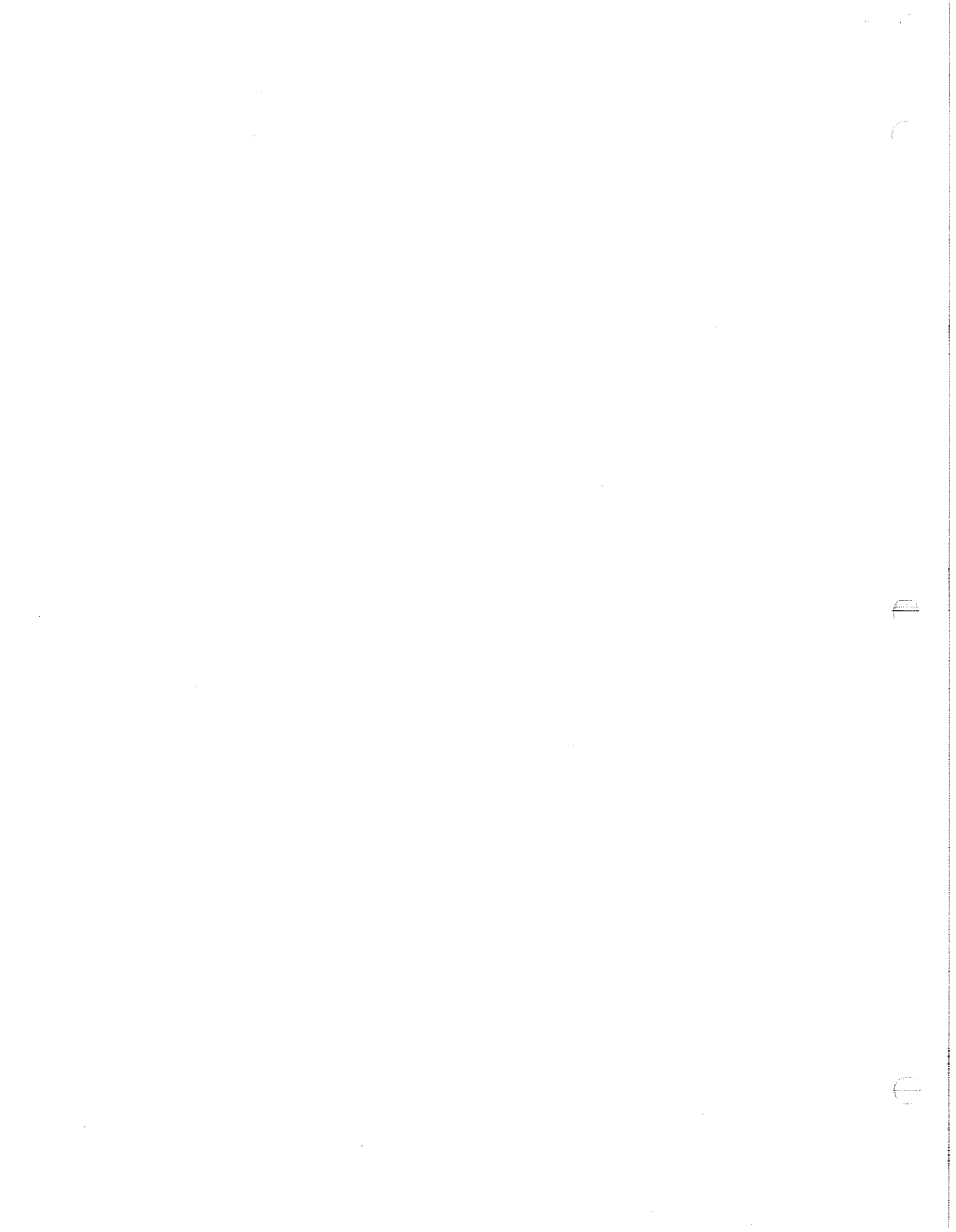
1/4/2008

Fax: (905) 764-9386

Email Address: rurbanski@senes.ca

Web Site: <http://www.senes.ca/>

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Pascale Marceau

From: Richard Urbanski - SENES Consultants Limited [rurbanski@senes.ca]
Sent: Thursday, January 03, 2008 4:57 PM
To: Pascale Marceau
Subject: Doc Control 30NOV07 CEMJZFLARE Memo r1.doc

Attachments: 34220 30NOV07 CEMJZFLARE Memo r11.doc; ATT189950.txt



34220 ATT189950.txt
7 CEMJZFLARE! (1,014 B)

Re: 30 NOV 07 email - Doc Control

>Date: Fri, 30 Nov 2007 15:33:08 -0500
>To: Rudolf.Wan@ontario.ca, "Heeringa, Michael (ENE)"
><Michael.Heeringa@ontario.ca>
>From: Richard Urbanski - SENES Consultants Limited <rurbanski@senes.ca>
>Subject: 34220 30NOV07 CEMJZFLARE Memo r1.doc
>Cc: "Ken Campbell" <kcampbell@plascoenergygroup.com>
>
>Gentlemen:
>I have attached a memo that summarizes our telecon discussion yesterday
>relating to the final JZ Flare CofA Application items.
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>Please do not hesitate to call if I can be of additional assistance.
>Rich

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MEMORANDUM

TO: Rudolf Wan and Mike Heeringa
FROM: Rich Urbanski
CC: Ken Campbell
SUBJ: Tele Con re final items re JZ Flare CofA
DATE: 29 November 2007

Project Number 34220

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Rich

Pascale Marceau

From: Richard Urbanski - SENES Consultants Limited [rurbanski@senes.ca]
Sent: Thursday, January 03, 2008 4:59 PM
To: Pascale Marceau
Subject: Fwd: Doc Control email Dec 4, 2007 plasco flare ppm
Attachments: Rental Flare Emmissions2.xls; ATT189964.txt

Re: Doc Control email Dec 4, 2007

Date: Tue, 04 Dec 2007 11:49:36 -0500
To: Rudolf.Wan@ontario.ca
From: Richard Urbanski - SENES Consultants Limited <rurbanski@senes.ca>
Subject: Fwd: plasco flare ppm

Rudolf

These are the calculations (attached) used to derive the PPM NOX. Hope this is sufficient - call if I can help further..

Rich


X-Spam-Flag: NO
X-Authenticated-User: bmcewen.senes.ca
X-Envelope-From: bmcewen@senes.ca
X-Mailer: QUALCOMM Windows Eudora Version 6.2.5.6
Date: Tue, 04 Dec 2007 08:41:06 -0800
To: richard urbanski - SENES Consultants Limited <rurbanski@senes.ca>
From: Bryan McEwen - SENES Consultants Limited <bmcewen@senes.ca>
Subject: plasco flare ppm
X-Antivirus: Scanned by F-Prot Antivirus (<http://www.f-prot.com>)

Rich, see bottom of page for ppm calculations - 81 ppm for NOx for the worst case condition. This is actual NOx and not NOx as NO2 - so it should be exactly what you need.

Bryan McEwen, M.Sc.
Air Quality Meteorologist

SENES Consultants Limited
1338 West Broadway, Suite 303
Vancouver, British Columbia
CANADA V6H 1H2
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Web Site: <http://www.senes.ca/>

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liability for any errors, omissions, corruption or virus in contents or attachments. Information is provided for use "as is" by the addressee. Revised documents must not be represented as SENES work product, without express, written permission of a SENES Director.
Thank you.

Inputs

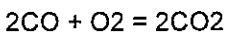
0.08 lb NOX/MMBTU fired
0.2 lb CO/MMBTU fired

Worst case 40 MMBTU/hr @ 9500Nm3/hr 10 % excess O2 syngas
 15 MMBTU/hr @ 9500Nm3/hr 2 % excess O2 propane

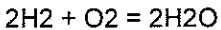
Composition of Syngas

20 CO
20 H2
12 CO2
48 N2

431.8 kmol/hr total gas

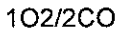


86.4 kmole CO in syngas feed
86.4 kmole CO2 produced in combustion

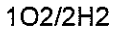


86.4 kmole H2 in syngas feed
86.4 kmole H2O produced in combustion

Excess Oxygen



43.2 kmol O2 required for CO combustion



43.2 kmol O2 required for H2 combustion

86.4 kmol O2 required to combust CO + H2

Excess Oxygen Cases

95 kmol O2 fed into combustion
8.6 kmol O2 excess unburned O2
452.4 kmol air inputted
357.4 kmol N2 inputted with combustion air

Total Gas Out of Flare		%	
357.4 kmol	N2	45	N2 inputted with combustion air
8.6 kmol	O2	1	Excess O2 unburned in combustion
86.4 kmol	CO2	11	combustion gases
86.4 kmol	H2O	11	combustion gases
51.8 kmol	CO2	6	from syngas
207.3 kmol	N2	26	from syngas
<hr/>			
797.8 kmol			

100

Nox & CO Concentrations

17552.4 Nm3/hr gases exiting the flare

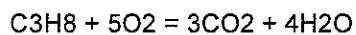
1.5 kg NOX/hr	3.6 kg CO/hr
83 mg/Nm3	207 mg/Nm3
81 ppm NOX @ 11% O2	330 ppm CO @11%O2

Summary of Results

Gas	syngas	syngas	propane	propane	propane	propane
MMBTU/hr fired	40	40	15	15	20	20
Excess O2	10	12	2	5	2	5
ppm NOX	81	79	40	39	48	47
ppm CO	330	323	163	160	196	192

Propane Information

46.4 MJ/kg Propane heating value
948 BTU/MJ conversion
341 kg/hr propane fed to flare
44 kg/kmol MW of propane
7.75 kmol/hr Propane fed to flare



23.3 kmole CO₂ produced
31.0 kmole H₂O produced

Excess Oxygen

5O₂/C₃H₈

38.8 kmol O₂ required for CO combustion

Excess Oxygen Cases

39.5 kmole O₂ consumed in combustion including excess O₂
0.8 kmole excess O₂
188.2 kmol air required for combustion plus excess O₂
148.7 kmol N₂ inputted with combustion air

Total Gas Out of Flare		%		
148.7 kmol	N ₂	23		N ₂ inputted with combustion air
0.8 kmol	O ₂	0		Excess O ₂ unburned in combustion
23.3 kmol	CO ₂	4		combustion gases
31.0 kmol	H ₂ O	5		combustion gases
		0		
431.8 kmol	N ₂	68		from syngas
<hr/> 635.5 kmol				

Nox & CO Concentrations

13981.8 Nm³/hr gases exiting the flare

0.5 kg NO_x/hr
39 mg/Nm³

40 ppm NO_x @ 11% O₂

1.4 kg CO/hr
98 mg/Nm³

163 ppm CO @ 11% O₂

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