

Technical Review Session for the Draft Alberta Quantification Protocol for Engine Fuel Management and Vent Gas Capture

October 8, 2008 1pm MST Meeting and Teleconference

Summary of Changes/Issues

Change 1: Definition of Engine Management System- removed second sentence on page 7

Issue 1: Flare Destruction Efficiency not defined in Flexibility Mechanism

Issue 2: Engine loads are not tracked during project condition and load changes could impact fuel use

Issue 3: Consistency of Protocol Applicability Criteria with ERCB Directive 60

Issue 4: Monitoring of engine parameters (Air Fuel Ratio and Ignition Advance)

Attendees:

Name	Organization
Jamie Callendar	Blue Source
Vince Elenko	EnCana
Omar Hurtado	EnCana
Blair Rudy	EnCana
Lee Wagner	EnCana
Matthew Bonko	EnCana
Brian Murray	REM Technology
Howard Malm	REM Technology
Gerald Palanca	PetroCanada
Milos Krnjaja	BP
Dr. Alex De Visscher	University of Calgary
Amanda Stuparyk	Climate Change Central

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Invitees:

Name	Organization
Frank Zahner*	Accurata
David Picard	Clearstone Engineering
Joe Lukacs	CETAC West
James Vaughen	Energy and Resources Conservation Board
Michael Brown**	Energy and Resources Conservation Board
Keith Madson	BP
Chad Simmonds	BP
Don Brick	Spartan Controls

*Reviewed the protocol following the Technical Review Session

**Provided background on ERCB Directive 60 following the Technical Review Session

Meeting Minutes:

1. **Introductions:** Jamie Callendar, Blue Source
2. **Why we are here, Alberta Policy Context :** Amanda Stuparyk, Climate Change Central
 - Alberta Regulatory Framework
 - Offsets – Market in AB
 - Projects start after Jan 1, 2002
 - Real (one of 21 main IPCC recognized GHGs), demonstrable, quantifiable
 - Not regulated by law
 - Clearly defined ownership (verifier will seek clear ownership)
 - Generated in Alberta - **investment** / project **undertaken** in Alberta
 - Not double counted (only serialize on one system)
 - Verified by 3rd party (chartered account/certified engineer)
 - Ex Poste Verification
 - The Protocols are based on the ISO 14064 Part 2 Standard
3. **Principles to Guide Protocol Decisions/Development** - Climate Change Central
 - A. Environmental Integrity
 - B. Usability/Practicability
 - C. Adapting Precedents
 - D. Life Cycle
4. **Introduction to Protocol-** Jamie Callendar

- Overview of the Protocol
- Generate offsets through (1) quantifying the GHG emission reductions from improving the fuel efficiency of natural gas combustion engines through the implementation of an engine management system (i.e. installing an air-fuel ratio controller) and (2) from the capture and combustion of vented gases containing methane (e.g. capturing vent gas sources common to natural gas during gas transmission).
- Approach to quantification - Projection-based using metered data
- Alberta Protocol Format; ISO 14064-2 Approach;
- Layout of protocol, process flow diagrams; SS diagrams.

5. Review of Protocol: Jamie Callendar

- review of protocol scope (no comments received)
- Applicability criteria
- Flexibility mechanisms
- Lifecycle figures (no comments received)
- Project Scenario (no comments received)
- Baseline Scenario,
- Selection of Relevant SSRs (no comments received)
- Quantification Approaches in Table 2.4
- Appendices

Main Comments/Discussion Points from Review of Protocol:

5.1. Flare Efficiency is not accounted for in the flexibility mechanism

-Howard - The flexibility mechanism does not consider the (methane) destruction efficiency of the flare and the quantification may not be technically correct as the GHG emissions from operation of a flare in the baseline may be underestimated.

-Jamie - You are correct and this was a slight oversight, however there may be a few ways to address this, including leaving the efficiency out and assuming 100% efficiency, which would be conservative in the baseline scenario.

Alternatively, if the project proponent wishes to claim the emission reductions from reduced flare operation then they could use a site specific flare efficiency from combustion testing

Otherwise default flare efficiencies could be used (e.g. for open flare, enclosed flare, incinerator, etc.) provided that they are acceptable and we may be able to refer to ERCB directive 60 for guidance on this

-Gerald- There has been some work done at the University of Alberta on flare efficiency in Alberta

-Milos - Some emission factors may take these emissions into account already

-Jamie - The Environment Canada emission factors in the protocol do not take this into account and I don't think the CAPP factors for flaring do either since flare efficiency can be quite variable.

-Jamie - *We will flag this issue to address with any other technical issues that arise today.*

5.2. Re-assessment of Baseline as per Applicability Criteria 7b

-Howard- How would the project re-assess its baseline since the physical equipment change cannot be reversed?

-Jamie- this "re-assessment" refers to the 8 year crediting period for offsets in Alberta, which is a policy decision and at the end of the 8 years Alberta Environment may examine the baseline scenario to see if this type of emission reduction project is still surplus to regulation and still not a common industry practice or not.

-Jamie- as far as projects that are already operating and did not follow the (yet to be released) protocol, the fuel savings would be assessed under the flexibility mechanism when data on fuel savings from the implementation of 5 or more installations of a particular engine management system has been completed on a given type of engine becomes available.

5.3. Definition of engine management system in the glossary

Howard Malm- The last sentence of the definition is not clear

Jamie- does the first sentence of the definition work on its own or should we add to it?

Howard- the first sentence is sufficient on its own

Jamie- The second sentence will be removed from the definition in the protocol

5.4. Engine Loading

Milos- The protocol may not properly address the impact of engine loading on the fuel consumption, such as the difference in fuel consumption for a highly loaded engine (lower savings) versus a less loaded engine (higher savings). This may occur when the engine loading changes a few years down the road due to declining reserves etc.

Milos- For example the PTAC study showed a range of 8% fuel savings at high loads to 18% fuel savings at low loads.

Howard- The PTAC study had some issues where the engines were not properly adjusted with the air-fuel ratio during testing.

Lee Wagner- This issue is mainly due to the challenge of getting a wide range of loads at many sites when you are installing the engine management system as many sites are not that flexible.

Howard- It also depends on the engine tuning at the time of installation

-Jamie- the BSFC method does take the load into account to a certain degree since BSFC is the fuel consumption per unit of load (Btu/bHP-h).

Lee- it is easier to get a lower load than a higher load

Lee- the main challenge is that there isn't a strong data set that we can rely on to determine the difference in fuel consumption with an engine management system at high or low loads, but as we gather more data we can re-assess the baseline

Jamie- The protocol approach is conservative at the moment and likely underestimates the fuel savings,

Jamie- there may be an opportunity to tie this issue into the flexibility mechanism so that if a material difference in fuel savings occurs that the current method underestimates, then the project proponent may re-evaluate the baseline provided that data is available from at least 5 different engines

Jamie- This issue will be flagged for further discussion to assess how the protocol can be modified or if the flexibility mechanism is the best way to address this issue.

5.5. Vent gas composition

Omar- Are you assuming the vent gas composition to be different from the fuel gas composition?

Jamie- In the majority of cases it will be very similar (ie venting of sales quality natural gas from instruments or compressor seals), but the protocol is intended to be flexible enough to allow for any type of vent gas

5.6. ERCB Regulations/Guidelines

Milos- ERCB Directive 60 has specific guidelines around recovery of vent gases where economic (decision tree) and possible to sustain stable combustion, are we overlooking these regulations?

Brian Murray- Many sources of vent gas (e.g. instrument vents) cannot sustain stable combustion as they are intermittent or result in back pressure

Jamie- The protocol does state that the project proponent cannot claim offsets from avoided venting when they are required to flare under the Applicability section, but we could expand the wording to be more explicit, our understanding was that Directive 60 was mainly focussed on Solution Gas rather than intermittent sources of vent gas.

-Milos to provide the specific section of Directive 60 that is relevant

Jamie- We will review the regulation and update the protocol wording as necessary and discuss this with the two members of the ERCB who were unable to make it to the review session today.

5.7. Measurement frequency

Omar- Why did you choose annual measurement of vent and fuel gas compositions?

Jamie- The majority of project scenarios would have predictable streams and this frequency of measurement was seen as practical

Lee- additionally most gas processing/transmission facilities test gas compositions once a year.

Jamie- Appendix C also has some guidance on using fuel or vent gas analyses (compositions) to determine density and heat value.

5.8. Measurement and Monitoring

Howard- The protocol does not consider changes in engine set points, such as if the ignition advance was changed after the project proponent did the pre and post audits and this would impact the fuel efficiency of the engine or if the air fuel ratio set point was changed (ie how lean or rich the engine is running).

Howard- Recommend tracking engine service records

Jamie- We could certainly add monitoring procedures for these items after the post audit, similar to the table of pre and post audit parameters in Appendix C-2 on page 62.

Jamie- We will flag this issue to include updates to the monitoring approach in protocol.

Next Steps

Howard – How long will the protocol development process take?

Amanda – Looking at a timeframe of: 2nd round technical review (December 2008), 3rd round public review (Jan-Feb), final submission of revised protocols to Alberta Environment for final approval, approval and posting of Offset System Quantification Protocol (March-May '09)

-Oct 20th deadline for written comments to be sent to Blue Source

-Blue Source will solicit written comments from invitees who couldn't attend today

-Meeting minutes and summary of issues and resolutions will be sent to the group in late October

-Stakeholder review session to be in December

-Final protocol approval spring next year hopefully