Finnish Recovery Boiler Committee

SKYREC STEERING COMMITTEE MEETING IX

TIME 29.1 – 2.2.2010

PLACE E-mail meeting

PARTICIPANTS

Matti Tikka	UPM-Kymmene Oyj, Kymi, chairman
Lasse Koivisto	Andritz Oy, Varkaus
Timo Peltola	Sandvik, Helsinki
Keijo Salmenoja	Chairman of Finnish Recovery Boiler Association
Kalle Salmi	Metso Power Oy, Tampere
Timo-Pekka Veijonen	Stora Enso Oyj, Imatra

Group members without a right to vote:

Olli Talaslahti	Oy Metsä-Botnia Ab, Rauma
Markus Nieminen	Finnish Recovery Boiler Association, secretary

APPENDIXES

I Offer: Nikolai DeMartini, Åbo Akademi: Co-combustion of mixed fuels, phase 2 – wood and lean BL

II Offer: Nikolai DeMartini, Åbo Akademi: Co-combustion of mxed fuels, phase 2 – biosludge addition

DISTRIBUTION

Steering committee and their substitutes
Durability Sub Committee, Black Liquor Sub Committee
Board of the FRBC
MNN, OMP, EPT/Files

1 CALLING MEETING TO ORDER

1.1 Abcences

Hiroshi Matsuo	Sumitomometal Industries,Ltd.
Mika Paju	Oy Metsä-Botnia Ab, Joutseno
Martti Korkiakoski	Tekes, Helsinki
Reijo Hukkanen	Stora Enso Oyj, Oulu
Esa Vakkilainen	LUT, project coordinator

2 PROPOSALS

2.1 Åbo Akademi, Co-combustion of mixed fuels, phase 2 (WP1, S1)

Two separate offers have been received from ÅA:

- One consists droplet combustion tests with wood and lean BL, price 16 500 €, Appendix I
- Second will focus on better understanding the behaviour of nitrogen in biosludge, price 7100 €, Appendix II

Total cost: 23 600 euros.

Decision:
It was decided to order the both works. Work will be done in English and supervised by black liquor sub-committee.

3 NEXT MEETINGS (MEETING CALENDAR FOR 2010)

The next meeting will be held as agreed before at Pöyry Finland Oy, Vantaa, on March 17th at 10.00 a.m.

APPENDIX I
Åbo Akademi,
Co-combustion of mixed fuels, phase 2 – wood and lean BL
OFFER

SKY-REC Co-combustion of mixed fuels –Phase 2

29 December 2009

Objective. The proposed work for phase 2 will build on the promising results of the first study of the combustion of mixtures of black liquor with bark, wood, peat or biosludge. This phase 2 work will focus on wood and lignin lean BL and will provided data to help answer the following questions:

1. At what addition level does the mixture burn more like wood than black liquor?
2. What is the fate of nitrogen in BL+wood mixture - does the char have more cyanate?
3. What are the burning characteristics of reduced lignin black liquor?
4. What is the fate of nitrogen in lignin lean black liquor?
5. What is the impact of wood on the combustion properties of lignin lean BL?

Proposed Work. The following pieces are proposed based on the above four questions:

1. At what addition level does the mixture burn more like wood than black liquor?
   Droplet combustion tests (1100 °C, 3% O2) with 100% wood; mixtures: 50/50 BL/wood on a dry solids basis and then one other ratio either higher or lower than 50/50 depending on those results. These tests would use the same "dry" wood we have used thus far.
2. What is the fate of nitrogen in BL+wood mixture - does the char have more cyanate?
   Pyrolysis (100% N2) + char gasification experiments (13% CO2/87% N2) with BL and one BL + wood mixture.
3. What are the burning characteristics of reduced lignin black liquor?
   a. Droplet combustion tests (1100 °C, 3% O2) with BL with 100% lignin and BL+ 75% lignin and BL+ 50% lignin.
   b. Droplet combustion tests (900 °C, 3% O2) with BL with 100% lignin and BL+ 75% lignin and BL+ 50% lignin.
   c. This work includes analysis of total Kjehldahl nitrogen in the reduced lignin black liquors and the lignin.
4. What is the fate of nitrogen in lignin lean black liquor?
   Pyrolysis (100% N2) + char gasification experiments (13% CO2/87% N2) with BL +75% lignin
5. What is the impact of wood on the combustion properties of lignin lean black liquor?
   Droplet combustion tests at 1100 °C, 3 % O2 with lignin reduced black liquor (BL + 75% lignin and BL + 50% lignin) with wood added to replace the energy loss of the lignin.

Cost. The total cost of this project will be **16.500 €** not including VAT.

APPENDIX II
Åbo Akademi,
Co-combustion of mixed fuels, phase 2 – biosludge addition
OFFER

SKY-REC Co-combustion of mixed fuels –Phase 2 Biosludge Addition

21 January 2010

Objective. This is the description and price for including biosludge into the Phase 2 mixed fuels work. This phase 2 work with biosludge will focus on better understanding the behavior of nitrogen in biosludge with a focus on the following questions:

1. How much of the nitrogen in biosludge nitrogen is lost for biosludge; biosludge + black liquor after 30 minutes of heat treatment at an agreed upon high solids concentrator temperature followed by concentration of the liquor?
2. How does a 5 wt% d.s. biosludge addition affect black liquor combustion?
3. Does biosludge addition change the cyanate concentration in smelt?

Proposed Work. The following pieces are proposed based on the above three questions:

1. A fresh biosludge sample will be analyzed for total nitrogen and ammonia as will the heat treated biosludge and black liquor/biosludge mixture (the concentrated black liquor will be analyzed already in the main part of the project for total nitrogen – any ammonia will have already be released).
2. Single droplet combustion tests will be carried out at 1100 °C, 3% O_2 and swelling, CO + CO2 and NO will be measured as in phase one, but using a much higher level of biosludge addition.
3. Single droplets of the 5 wt % d.s. biomass/95 wt % d.s. BL will be pyrolyzed (800 °C in N_2) and interrupted gasification tests will be made to determine if more cyanate is formed during the char conversion of black liquor – biosludge mixtures.

Cost. The total cost of this portion of the project will be **7 100 €** not including VAT.

Prepared by:
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