Seminar on the Joint Crediting Mechanism (JCM) Project Implementation in Indonesia

Utility Facility Operation Optimization Technology
“RENKEI” Control

12th July, 2017
Azbil Corporation
Agenda

1. Project Overview
2. Project Implementation
3. GHG emission reductions and MRV
Project Overview

Target Facility

Project Location

Condensate

Power Demand

Area50
51
G1,G2,G3

MP
S
19.5
k
34
0
℃

Area500
510G301

Parax
51G201

×3
×1
×3
×1

MPS
Demand

WHB
A-10

Area5
510G101,G102,G103

Area50
510G301

Area500
510G301

Visbreaker WHB
WHB-019
130t/h

Visbreaker WHB
WHB-019

Platformer WHB
WHB-014
20t/h

Power
Demand

WHB
A-KPC

Area5
510G101,2101,2102,2103

FO
FG

Area5
510G101

Area5
510G101

HPS 52k
460℃

Area50
51

PT Pertamina
1) JCM (MRV) Execution
2) PJ Management
3) Reporting to NEDO
4) Design/Manufacturing/
Procurement/Test
Site Installation/Commissioning
Maintenance

DGMIGAS

Azbil Corp. (Japan)
1) JCM (MRV) Execution
2) PJ Management
3) Reporting to NEDO
4) Design/Manufacturing/
Procurement/Test
Site Installation/Commissioning
Maintenance

PT Azbil Berca Indonesia
1) Support for Site Activity
2) Data Gathering
3) Site Installation Support
4) Maintenance

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Project Overview

Optimization Strategy ("RENKEI" Control)

- CO2 Emission Reduction by Optimization Control
  - Optimal Number of Boilers
  - Optimal PC Master Boiler Selection
  - Optimal Boiler Load Allocation
  - Optimal O2 Excess Control

"RENKEI" Control (Please refer IEC TR 62837)

The Japanese word "RENKEI" literally translated as "cooperation or coordination" which suggests that "RENKEI control" is to pursue energy efficiency optimisation with two or more elements interacting within one another to provide the most efficient and effective result from the control.

Target CO2 Reduction
2% Fuel Reduction
(From 10 Boiler’s Fuel Consumption)
Around 20,000t-CO2/Year reduction

Total System Efficiency
Project Overview

**Optimization Flow**

- **Energy Management System**
  - Boiler Efficiency Update

**Off Line Optimization**

- Every one minute

**On Line Optimization**

- Optimal Load Allocation

**Guidance for DCS Manual Operation**

- Event Basis
- Optimal Number of Boiler
- Optimal Boiler Selection
- Optimal Master Boiler Selection

**Existing DCS Control**

- PID Tuning
- Loop Modification

**CO2 Emission Reduction Calculation**
Project Overview

System Configuration

Control Room UTL-1
- On line control display
- Client

Control Room UTL-2
- On line control display

Staff Office
- Client

Server
- <EMS Server>
  - OPC IF
  - Real Time DB
  - Baseline calculation
  - Efficiency calculation
- Energy Management Server
- APC server

Offline Optimization
- <APC Server>
  - Data Access
  - Online Control

Supplied Equipment

DCS UTL-1
- OPC GW
- LCN

DCS UTL-2
- OPC GW
- LCN
# Project Implementation

## Project Schedule

<table>
<thead>
<tr>
<th>Items</th>
<th>2017</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>1 Basic plan</td>
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<td></td>
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<tr>
<td>2 Design</td>
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<td></td>
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<tr>
<td>3-1 Procurement</td>
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<tr>
<td>3-2 Manufacturing</td>
<td></td>
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<tr>
<td>4-1 Transportation I (Japan-Border of Indonesia)</td>
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<tr>
<td>4-2 Transportation II (Border to the Project Site)</td>
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<tr>
<td>5-1 Instructions and drawing up procedures of Installation</td>
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<tr>
<td>5-2 Installation</td>
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<tr>
<td>6-1 Instructions and drawing up procedures of operation</td>
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<td>6-2 Commissioning</td>
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<tr>
<td>6-3 Operation</td>
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**Implementation**

**Monitoring Period**

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Project Implementation

Technology Replication Opportunities

“RENKEI” Control maximize Total System Efficiency.
- Project Duration => Short
- Investment => Much Smaller than H/W investment

Many Opportunity in Indonesia.
- (Not only for Refinery and also for P&P, Textile, Fertilizer and Petrochemical etc.
  - Multiple Boilers under same header, Multiple Steam Turbine system)

**Target Saving** from **2% to 5%** reduction by “RENKEI” Control

Example: Target Facility
GHG Emission Reduction and MRV

JCM Schedule

<table>
<thead>
<tr>
<th>Items</th>
<th>2017</th>
<th>2018</th>
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<tr>
<td>7 Submission of PDD</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
<td></td>
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<tr>
<td>8 Validation</td>
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<td></td>
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<tr>
<td>9 Application/JCM Project</td>
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<td>10 Monitoring Report</td>
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<td>11 Verification</td>
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<tr>
<td>12 Dissemination Activities</td>
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</tr>
</tbody>
</table>

KOM 3/M
Complete Install 9/F
Complete Commission 10/E
First Verification 2/E
Final Verification 11/F

<JCM Activity>
Dissemination Activity

<Selected Approved Methodology>
ID_A M007
GHG emission reductions through optimization of boiler operation in Indonesia