UNDERGROUND COAL MINING TRAINING
IN PT. GERBANG DAYA MANDIRI

BY:
WIRA KISMANTORO
JAKARTA, JANUARY 23rd, 2020
## COMPANY PROFILE

<table>
<thead>
<tr>
<th>No.</th>
<th>DETAIL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>** Company Name **</td>
<td>PT. GERBANG DAYA MANDIRI</td>
</tr>
<tr>
<td>2</td>
<td>** Number of SK IUP OP PMA **</td>
<td>3216 K / 30 / MEM / 2015</td>
</tr>
<tr>
<td>3</td>
<td>** WIUP / WIUPK Code **</td>
<td>KTN20102794 OP</td>
</tr>
<tr>
<td>4</td>
<td>** Commodity **</td>
<td>Coal</td>
</tr>
<tr>
<td>5</td>
<td>** Period of WIUP/WIUPK **</td>
<td>September 13, 2006 to September 13, 2026</td>
</tr>
<tr>
<td>6</td>
<td>** 2020 Production Plan **</td>
<td>456,500 MT</td>
</tr>
<tr>
<td>7</td>
<td>a. ** Coal **</td>
<td>OP: 400,000 MT, UG: 56,500 MT</td>
</tr>
<tr>
<td>8</td>
<td>b. ** Processing **</td>
<td>456,500 MT</td>
</tr>
<tr>
<td>9</td>
<td>** Area of Production Operation Permit**</td>
<td>Forest Area</td>
</tr>
<tr>
<td></td>
<td>HK</td>
<td>HL</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>** Project Area (Active) **</td>
<td>In the WIUP: 708.41 Ha, outside WIUP: 30.42 Ha. Total: 738.83 Ha.</td>
</tr>
</tbody>
</table>
WORK LOCATION

- Administratively, PT. Gerbang Daya Mandiri (GDM) is located in Bangun Rejo Village, Manunggal Jaya Village and Karang Tunggal Village, Tenggarong Seberang District, Kutai Kartanegara Regency, Kalimantan Province.
- Jakarta - Samarinda - Tenggarong Seberang
- The travel time is ± 2 hours
UNDERGROUND COAL MINING TRAINING

PURPOSE
To implement an Advanced Training Program for Underground Coal Mining Employees to Support the Mechanized Mining Plan for Underground Coal in PT. Gerbang Daya Mandiri

OBJECTIVE
To improve the Knowledge and Capability of Employees of PT. Gerbang Daya Mandiri in Underground Coal Mining, and its Production Operations can be Safe, Effective, Efficient and Environmentally Friendly.

REALIZATION
The implementation of Underground Coal Mining Technology Training at PT. Gerbang Daya Mandiri and the Kushiro Coal Mine, is a collaboration program between the Indonesian government and the Japanese government through a coal mining technology training program (The Training Project of Coal Mining Technology).
PROGRESS OF THE UNDERGROUND MINE IN PT GDM

PROGRESS (M) vs TAHUN
PROGRESS MAP OF UNDERGROUND MINE
PT. GERBANG DAYA MANDIRI
Area: 1,758 Ha

Village: Manunggal Jaya
District: Tenggarong Seberang
Regency: Kutai Kartanegara
Province: Kalimantan Timur

LEGEND:
- Progress of UG Production Year 2014 (124.04 meter)
- Progress of UG Production Year 2015 (327.88 meter)
- Progress of UG Production Year 2016 (563.31 meter)
- Progress of UG Production Year 2017 (759.45 meter)
- Progress of UG Production Year 2018 (461.19 meter)
- Progress of UG Production Jan-Mar 2019 (228.403 meter)
- Progress of UG Production Apr-Jun 2019 (147.38 meter)
- Progress of UG Production Jul-Sept 2019 (326.77 meter)
- Progress of UG Production Oct-Dec 2019 (265.02 meter)

RESUME TOTAL DISTANCE OF PRODUCTION PROGRESS

Total UG production Progress until Dec 2019 – Longwall 1

<table>
<thead>
<tr>
<th>Month</th>
<th>Alley Progress Distance</th>
<th>(meter)</th>
<th>Quarter Total (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>2.70</td>
<td>97.15</td>
<td>122.85</td>
</tr>
<tr>
<td>Feb</td>
<td>0.47</td>
<td>168.20</td>
<td>178.67</td>
</tr>
<tr>
<td>Maret</td>
<td>20.72</td>
<td>5.60</td>
<td>26.32</td>
</tr>
<tr>
<td>April</td>
<td>45.63</td>
<td>0.00</td>
<td>45.63</td>
</tr>
<tr>
<td>Mei</td>
<td>17.30</td>
<td>0.00</td>
<td>17.30</td>
</tr>
<tr>
<td>Juni</td>
<td>44.28</td>
<td>0.00</td>
<td>44.28</td>
</tr>
<tr>
<td>Juli</td>
<td>105.91</td>
<td>38.10</td>
<td>144.01</td>
</tr>
<tr>
<td>Agustus</td>
<td>60.50</td>
<td>0.00</td>
<td>60.50</td>
</tr>
<tr>
<td>September</td>
<td>0.00</td>
<td>16.38</td>
<td>16.38</td>
</tr>
<tr>
<td>Oktober</td>
<td>0.00</td>
<td>64.05</td>
<td>64.05</td>
</tr>
<tr>
<td>November</td>
<td>0.00</td>
<td>5.10</td>
<td>5.10</td>
</tr>
<tr>
<td>Desember</td>
<td>0.00</td>
<td>0.93</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Total Progress January – March (1st Quarter) 228.403 meter

Total Progress April – June (2nd Quarter) 147.38 meter

Total Progress July – September (3rd Quarter) 326.77 meter

Total Progress October – Dec (4th Quarter) 265.02 meter

Total Progress 2019 967.57 meter
TRAINING MATERIALS BY MMR

1. Mining Technology
   - Mining Progress and Alley Maintenance Technology
   - Survey and Measurement Technology
   - Underground Mining Design Technology

2. Transportation Technology
   - Transportation and Hoist Engine Control Technology

3. Machinery Technology
   - Technology of Drainage Control, Care and Maintenance of Each Type of Machine

4. Electricity Technology
   • Technology for Controlling and Maintenance of Every Electrical Equipment in the Mine Surface and Alley

5. Ventilation Technology

6. Safety
   - Emergency response, first aid and rescue
TRAINING MATERIALS BY KCM

Mining & Safety Management

1. Mine planning
2. Ventilation Technology
3. Drilling Technology
4. Safety Oversight
5. Hazard Prevention
6. Mining Technology (roadway & longwall)
7. Machinery Technology
8. Electricity Technology
9. Gas Release Technology
10. Preparation Technology
IMPLEMENTATION OF TRAINING

Project Implementation Time
1. Training by MMR for fiscal year 2018 = 1,196 Employees
2. Training by KCM:
   • November 21 to December 29, 2017 = 1 employee (312 hours)
   • November 20 to December 28, 2018 = 1 employee (312 hours)
   • November 19 to December 27, 2019 = 1 employee (312 hours)

Location of Training
1. Underground Mining Location of PT. Gerbang Daya Mandiri in Tenggarong Seberang District, Kutai Kartanegara Regency
2. Location of the Kushiro Coal Mine Underground Mine in Kushiro, Hokaido, Japan
APPLICATION OF MINING SAFETY

1. Prevention of coal gas and dust explosion
a) Methane Gas
   - Checking the volume of air and methane gas by the safety team every shift
   - Installation of CH4 gas detector at a specific location that is connected to the monitor panel system
   - Interlock system (setting 1.0% CH4), if CH4 is detected more than 1.0%, the electricity will go out automatically
b) Coal dust
   - Spraying water during progress
   - Spraying water on material transportation equipment such as conveyor belts and chain conveyors
   - Cleansing accumulated coal dust
   - Limestone sowing on the in-seam roadway
c) Restrictions on welding / using fire in underground mines. If it is really urgent, Hot Permit is required.
2. Prevention of Spontaneous Combustion
   a) Monitoring
      • Installation of CO gas detectors at specific locations connected to the monitor panel system
      • Checking during every shift by the Safety team with a multigas detector
   b) The Safety Team checks for signs of spontaneous combustion such as coal / rock sweating, rising temperatures, smoke, odors in several locations and paying special attention to in-seam areas
   c) Perform injection, blockage and / or grouting

3. Mine Fire Prevention
   a) Restrictions on welding / using fire in underground mines. If it is really urgent, Hot Permit is required.
   b) Installation of Safety devices
      • Main Hoist Room: Over Current Relay Installation, APAR
      • Electric Room: Installation of Over Current Relay, Ground Relay, APAR
      • Belt Conveyor: Installation of Slip relay, Shute relay, Snaking detector, smoke detector, Emergency stop, Over load relay and Automatic APAR
   c) Methane Gas Checking
4. Prevention of flooding in underground mines
   • Installation of an automatic main pump with a pipeline connected from the pump tub in the alley to a pool on the surface by considering the volume of water and anticipating if there is a rapid increase in the volume of water
   • Installation of a backup pump, if the main pump is damaged to ensure the pumping system continues to run smoothly
   • Water level monitoring and control in the pump body on the monitor panel system

5. Monitoring displacement
   • Installation of rock deformation monitoring tools, namely tell tale and extensometer in a predetermined area. Measurements are carried out every day by the Engineering division
THE FACILITIES

South Slope

North Slope

Hoist 50 Hp

Main Fan 60 Hp (30 Hp)
Mining and Ventilation Technology

Mining & Ventilation Theory

Survey & Alley Design Theory

Polygon Measurement

Heading

MMR
Transportation, Electrical and Machinery Technology
First Aid and Safety in Mining

MMR
Mining & Safety Management
Explosion & Fire Prevention

Water Sprayer during Progress

Limestone Sowing

Gas Checking

Grouting & Injection

Temperature Checking
Safety Device

Interlock System (CH4)  Belt Snaking  Slip Detector

Smoke Sensor  Emergency stop  Automatic Fire Extinguisher

PT. GDM
Monitoring Displacement

Tell Tale

Extensometer

ETM02 Extometer

PT. GDM
Conclusion

• The Underground Coal Mining Technology Training conducted by MMR in PT. Gerbang Daya Mandiri and KCM in Kushiro Hokkaido, Japan has been well implemented.

• PT Gerbang Daya Mandiri's Underground Mining employees have gained experience and knowledge from Trainers of MMR and KCM which will be applied in PT. GDM.

• PT. Gerbang Daya Mandiri has finished building the 1st panel roadway tail gate and the 1st main gate, in preparation for coal production in the first longwall panel and is working to prevent danger in the underground mine.

• The Progress of Advanced Excavation Work at PT. Gerbang Daya Mandiri is due to the increased ability of employees in excavation operations, the ability to maintain and repair work equipment and increased understanding of underground coal mining safety.

• Coal mining with the Longwall system at PT. Gerbang Daya Mandiri, requires an improvement of the ability of employees in the fields of mining engineering, machinery, electricity, safety and further planning, especially as coal production will begin in the longwall panel.
Thank you

For the implementation of Technology and Safety training in the Underground Mine, PT. Gerbang Daya Mandiri would like to thank profusely:

• The Government of the Republic of Indonesia
• The Japanese government
• The Ministry of Energy and Mineral Resources
• The Center for Development of Geological, Mineral and Coal Human Resources
• Japan Oil, Gas and Metal National Corporation (JOGMEC)
• Mitsui Matsushima Resources Co., Ltd. (MMR)
• Kushiro Coal Mine (KCM)
• MMR & KCM Training Team
• Translators/Interpreters.
• Along with ladies and gentlemen and other parties which cannot be mentioned individually.
THANK YOU