

## BAB 7

### KESIMPULAN DAN SARAN

Bab ini menyajikan kesimpulan dan saran yang diperoleh dari hasil penerapan filter pada pintu inspeksi generator. Pembahasan dalam bab ini merangkum capaian utama dari perancangan dan implementasi yang telah dilakukan, sekaligus memberikan rekomendasi perbaikan berkelanjutan yang dapat menjadi acuan bagi unit terkait dalam meningkatkan kinerja sistem secara keseluruhan

#### 7.1. Kesimpulan

- a. PLTA LGS#3 memiliki sistem carbon dust, tetapi masih banyak masalah pada area *slip ring* generator yang kotor sehingga salah satu masalah utama pada generator LGS#3 adalah generator tersebut cepat kotor dan menyebabkan penurunan resistansi isolasi rotor/stator secara signifikan.
- b. Penerapan *kaizen* setelah di implementasikan dan terpasang viledon filter mampu meningkatkan kinerja generator dari parameter physical availability 92.0% menjadi 96.30% yang naik menjadi 4% dan mengurangi *opportunity loss production* sistem 4,346,072 USD

#### 7.2. Saran

- a. Penerapan *kaizen* dapat dilakukan di segala aktivitas dan dimulai dari hal-hal kecil, tanpa menunggu munculnya masalah yang besar yang terpenting adalah perbaikan yang dilakukan mampu menyentuh akar permasalahan sehingga solusi yang dihasilkan benar-benar efektif dan berkelanjutan
- b. Penerapan viledon filter ini dijadikan standar modifikasi untuk pintu inspeksi generator pada unit lainnya apabila memiliki karakteristik paparan debu karbon yang sama
- c. Melakukan pemantauan berkala terhadap kondisi filter, termasuk frekuensi penggantian dan pembersihan, guna memastikan performa penangkapan tetap optimal

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## LAMPIRAN

### Lampiran 1 Surat Balasan Perusahaan



Sorowako, 18 November 2025

No. : 176/LC/PTVIXI/2025  
Lamp : "  
Hal : Surat Balasan Kerja Praktik

Kepada Yth.  
**Dr. Ir. Parama Kartika Dewa SP., S.T., M.T**  
**Dekan Fakultas Teknologi Industri**  
**Universitas Atma Jaya Yogyakarta**

Dengan hormat,  
Surat permohonan Izin Kerja Praktik No. 138/I.A2/ITV2025 telah kami terima, bersama ini disampaikan bahwa mahasiswa yang namanya disebutkan di bawah ini sedang melakukan penelitian tugas akhir di PT Vale Indonesia Tbk. dengan jadwal sebagai berikut:

| Nama                          | NIM       | Periode                                 |
|-------------------------------|-----------|-----------------------------------------|
| Gladys Julica Gifiony Mangnga | 210811207 | 25 September 2025 s.d. 30 November 2025 |

Mahasiswa yang bersangkutan telah datang melapor di kantor Learning Center Sorowako pada tanggal 25 September 2025.

Perusahaan menyiapkan fasilitas:

- Makan setiap hari kerja di kantin perusahaan.
- Transportasi kendaraan dari tempat belajar selama masa kerja praktik.

Demikian kami sampaikan dan terima kasih atas perhatian serta kerja sama yang diberikan.

Hormat kami,

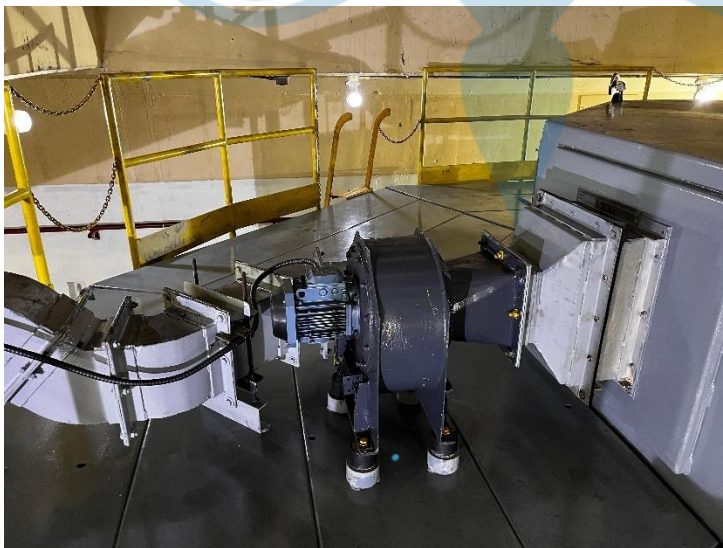


**Lavinia Budiyanto**  
Senior Manager Human Capital Governance & System

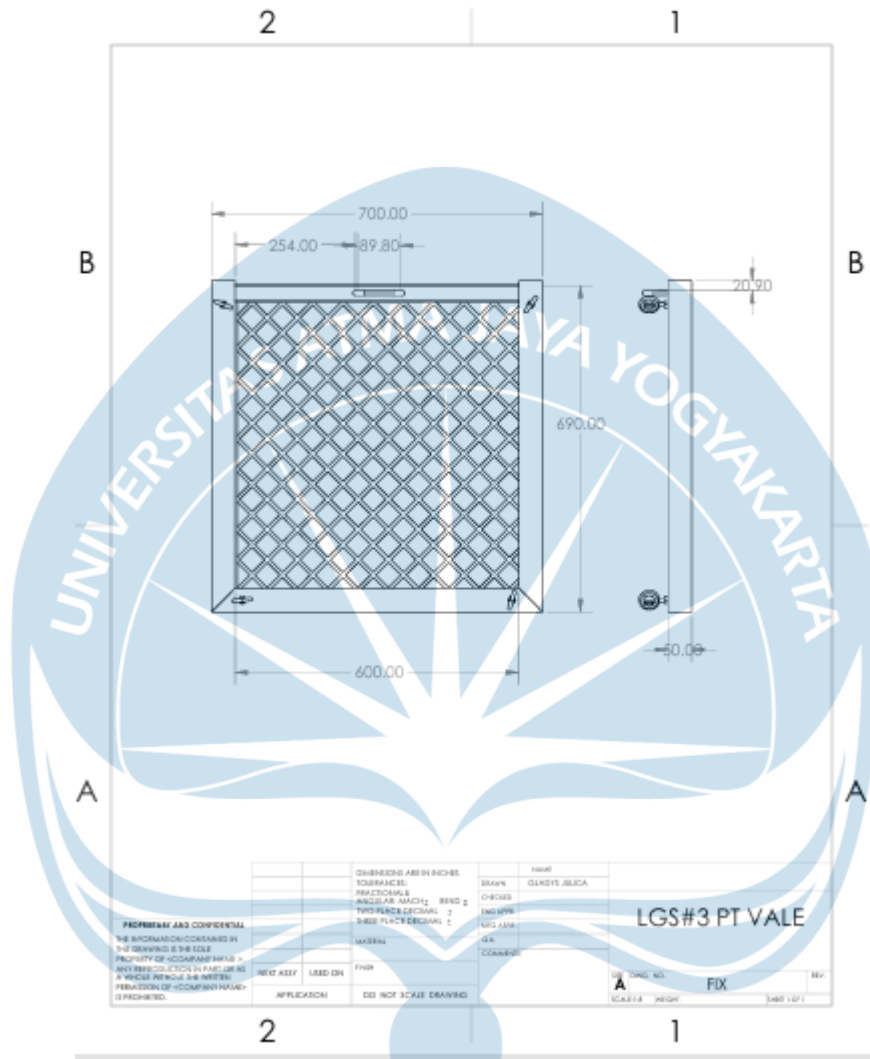
### Lampiran 2 Turbin LGS#3



### Lampiran 3 Sistem Penghisap Debu ( Carbon dust system )



# Lampiran 4 Gambar Teknik Modifikasi Pintu



#### Lampiran 4 Stakeholder Tim engineer



#### Lampiran 5 Stakeholder Tim Reliability



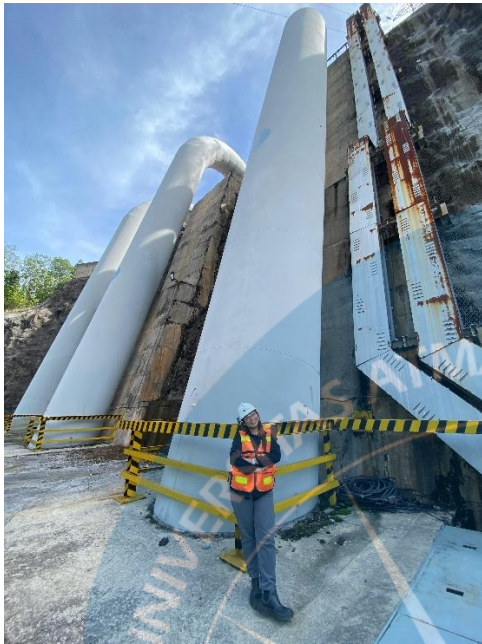
#### Lampiran 6 Stakeholder Tim Maintenance



#### Lampiran 7 Stakeholder Tim Operation



## Lampiran 8 Pipa Pentstock PLTA LARONA



## Lampiran 9 Sertifikat Implementasi (1)



## Lampiran 10 Sertifikat Implementasi (2)



### List of Completed Project

Name : Gladys Julica Girliony Mangnga  
 Institution : Universitas Atma Jaya Yogyakarta  
 Place of Job Training : Utilities Engineering, Reliability & Maintenance System

| No. | Final Project                                                                                            | Area              | Dicipline   | Engineer / Sponsor |
|-----|----------------------------------------------------------------------------------------------------------|-------------------|-------------|--------------------|
| 1   | Penerapan KAIZEN Dalam Modifikasi Pintu Inspeksi Generator Unit LGS#3 Larona Di PT. Vale Indonesia, Tbk. | Energy & Logistic | Reliability | M. Rais Bandaso    |
| 2   |                                                                                                          |                   |             |                    |
| 3   |                                                                                                          |                   |             |                    |
| 4   |                                                                                                          |                   |             |                    |

Sorowako, November 28<sup>th</sup>, 2025

  
**Ir. M. Rais Bandaso, S.T.**  
 Manager Asset Management & Reliability



## Lampiran 11 Turnitin

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## Lampiran 12 Hasil Bimbingan

| Search ... |                            | 2025/2026 - Ganjil | Pembimbing 1 TA: Anugrah Kusumo Pamosodji, S.T., M.T |                  | Tambah Bimbingan |
|------------|----------------------------|--------------------|------------------------------------------------------|------------------|------------------|
| No         | Tanggal Bimbingan          | Status Pesan       | Tipe Bimbingan                                       | Status Bimbingan | Action           |
| 1          | Senin, 22 Des 2025   13:15 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 2          | Senin, 22 Des 2025   13:14 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 3          | Jumat, 12 Des 2025   15:13 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 4          | Jumat, 12 Des 2025   15:11 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 5          | Jumat, 12 Des 2025   15:10 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 6          | Jumat, 12 Des 2025   15:09 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 7          | Jumat, 12 Des 2025   15:08 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 8          | Jumat, 12 Des 2025   15:07 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |
| 9          | Senin, 10 Nov 2025   09:25 | Bimbingan Selesai  | Online                                               | Dikonfirmasi     | ...              |

## Lampiran 13 Data Available Utilities 2020 Ketika Unit Generator Tidak Terjadi Pembersihan

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## Lampiran 14 Data Summary Ketika Unit Generator Tidak Terjadi Pembersihan Area Slip Ring Serta Viledon Filter Terpasang PA Menjadi Naik

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|----|-----------------------|--------|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| 2  | Physical Availability |        |         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 3  | Power Unit            |        | YTD avg | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 4  |                       |        |         | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 9  | LGS#3                 | Plan   | 93%     | 7  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 10 |                       | Actual | 94%     | 8  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 11 | BGS#1                 | Plan   | 98%     | 9  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 12 |                       | Actual | 98%     | 10 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 13 | BGS#2                 | Plan   | 98%     | 11 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 14 |                       | Actual | 98%     | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 15 | KGS#1                 | Plan   | 95%     | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 16 |                       | Actual | 94%     | 14 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 17 | KGS#2                 | Plan   | 96%     | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 18 |                       | Actual | 96%     | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 19 | MBDG#1                | Plan   | 100%    | 17 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 20 |                       | Actual | 99%     | 18 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 21 | MBDG#2                | Plan   | 84%     | 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 22 |                       | Actual | 81%     | 20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 23 | MBDG#3                | Plan   | 100%    | 21 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 24 |                       | Actual | 98%     | 22 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |

PA\_PowerSummaryWeeklyResultMonthlySheet1Power Record Failure

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## Lampiran 15 Data Available Utilities 2020 Ketika Unit Generator Outage atau Mati Selama 24 jam

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|    | A | B                               | LW         | LX         | LY         | LZ         | MA         | MB         | MC         | MD         | ME        | MF        | MG        | MH        | MI        |
|----|---|---------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|
|    |   |                                 | Week #48   |            |            |            | Week #49   |            |            |            |           |           |           |           |           |
|    |   |                                 | 11/23/2020 | 11/24/2020 | 11/25/2020 | 11/26/2020 | 11/27/2020 | 11/28/2020 | 11/29/2020 | 11/30/2020 | 12/1/2020 | 12/2/2020 | 12/3/2020 | 12/4/2020 | 12/5/2020 |
| 36 |   | Forecast Down Time              | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00     | 24.00     | 24.00     | 0.00      | 0.00      |
| 37 |   | Total Operating                 | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00     | 24.00     | 24.00     | 24.00     | 24.00     |
| 38 |   | Actual Plan Outage Hrs          | 0.00       | 24.00      | 24.00      | 24.00      | 0.00       | 0.00       | 0.00       | 0.00       | 0.00      | 0.00      | 0.00      | 16.66     | 24.00     |
| 39 |   | Standby Hrs                     | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |
| 40 |   | Force outage by Maintenance     | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |
| 41 |   | Force outage by Operation       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |
| 42 |   | Total Down Time Hours           | 0.00       | 24.00      | 24.00      | 24.00      | 0.00       | 0.00       | 0.00       | 0.00       | 0.00      | 0.00      | 0.00      | 16.66     | 24.00     |
| 43 |   | Operating Hours                 | 24.00      | 0.00       | 0.00       | 0.00       | 24.00      | 24.00      | 24.00      | 24.00      | 24.00     | 24.00     | 24.00     | 7.34      | 0.00      |
| 44 |   | Physical Availability           | 100%       | 0%         | 0%         | 0%         | 100%       | 100%       | 100%       | 100%       | 100%      | 100%      | 100%      | 31%       | 0%        |
| 45 |   | Utilization of Availability     | 100.00%    | 0.00%      | 0.00%      | 0.00%      | 100.00%    | 100.00%    | 100.00%    | 100.00%    | 100.00%   | 100.00%   | 100.00%   | 100.00%   | 0.00%     |
| 46 |   | Number of external trip failure | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0         | 0         | 0         | 0         | 0         |
| 47 |   | Number of internal trip failure | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0         | 0         | 0         | 0         | 0         |
| 48 |   | Number of Down by Maintenance   | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0         | 0         | 0         | 0         | 0         |
| 49 |   | MTBF                            | 1071       | 1071       | 1071       | 1071       | 1075       | 1078       | 1082       | 1085       | 1089      | 1092      | 1095      | 1097      | 1097      |
| 50 |   | MTTR                            | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0          | 0         | 0         | 0         | 0         | 0         |
| 51 |   |                                 |            |            |            |            |            |            |            |            |           |           |           |           |           |
| 52 |   | Forecast Down Time              | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00      | 24.00     | 24.00     | 24.00     | 24.00     | 24.00     |

PA Power

Summary

Weekly

Result

Monthly

Sheet1

Power Record Failure

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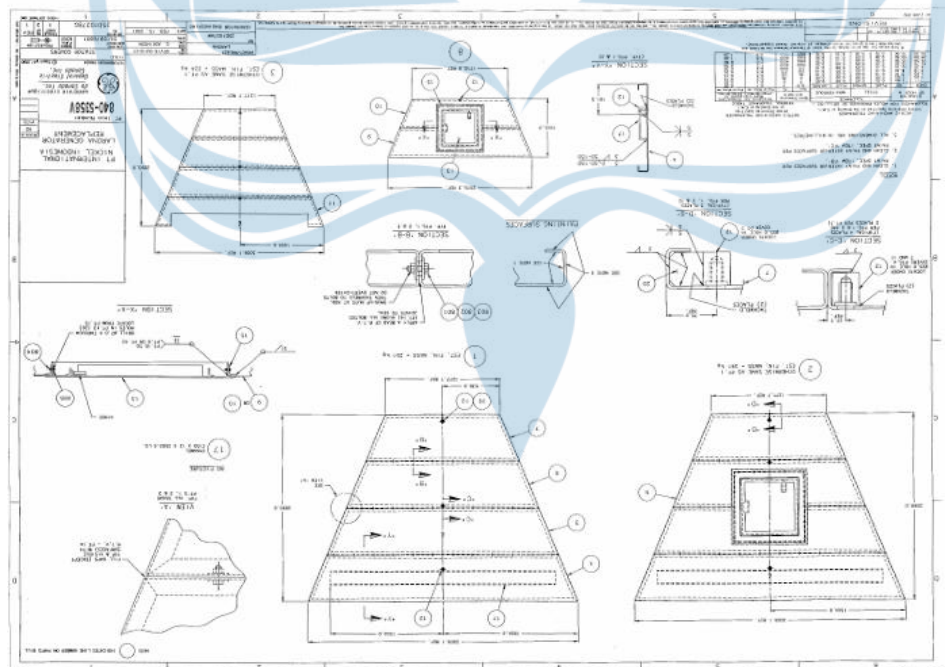
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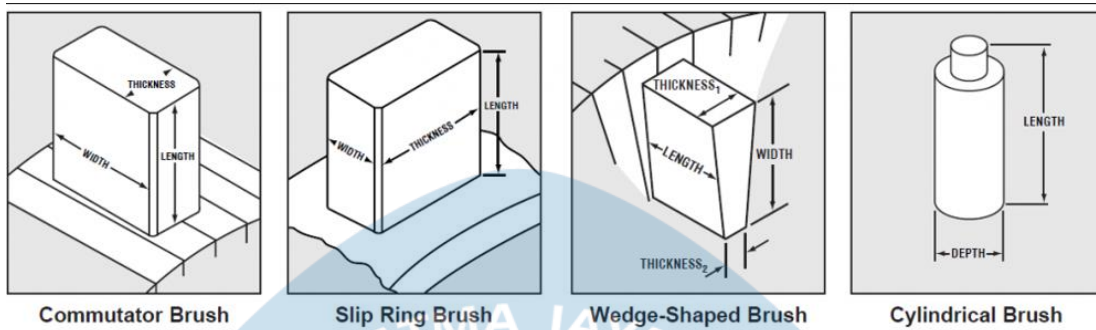
## Lampiran 16 Data Summary Ketika Unit Generator Mati 24 Jam Total Actual Tetap Dan PA Tidak Naik

|    |                       | NL      | NM   | NN | NO | NP | NQ | NR | NS | NT | NU | NV | NW | NX | NY | NZ | OA | OB |
|----|-----------------------|---------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 2  | Physical Availability |         |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3  | Power Unit            | YTD avg | 1    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9  | LGS#1                 | Plan    | 93%  | 7  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10 |                       | Actual  | 93%  | 8  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 11 | BGS#1                 | Plan    | 98%  | 9  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12 |                       | Actual  | 98%  | 10 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 13 | BGS#2                 | Plan    | 98%  | 11 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 14 |                       | Actual  | 98%  | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 15 | KGS#1                 | Plan    | 95%  | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 16 |                       | Actual  | 94%  | 14 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 17 | KGS#2                 | Plan    | 96%  | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 18 |                       | Actual  | 96%  | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 19 | MBDG#1                | Plan    | 100% | 17 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 20 |                       | Actual  | 99%  | 18 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 21 | MBDG#2                | Plan    | 84%  | 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 22 |                       | Actual  | 81%  | 20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 23 | MBDG#3                | Plan    | 100% | 21 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 24 |                       | Actual  | 98%  | 22 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

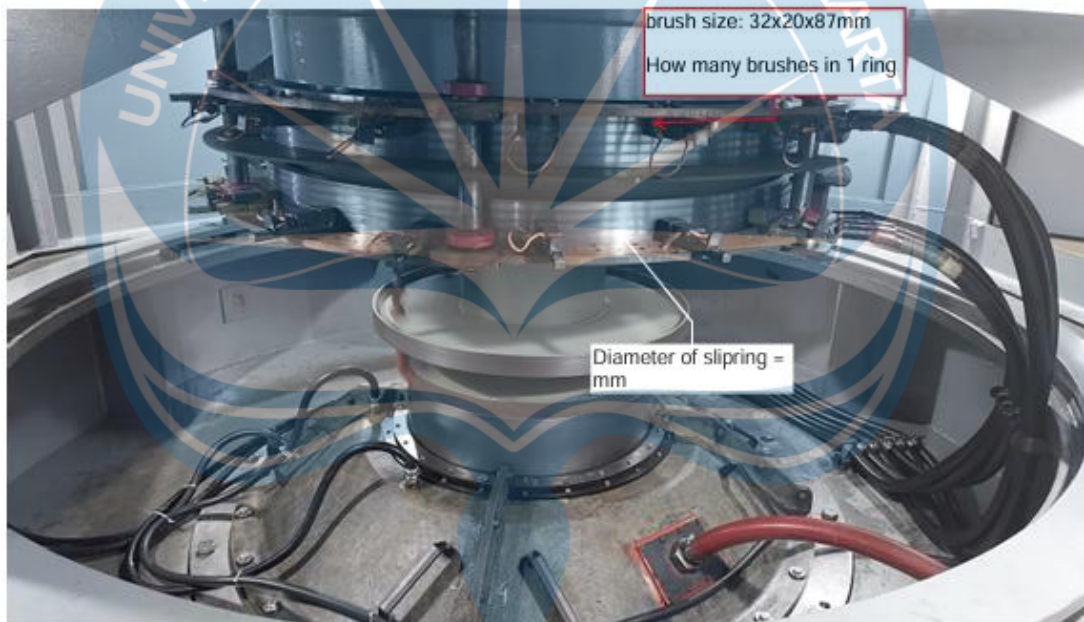
The image is a technical architectural drawing, likely a set of plans for a building. It features a large, detailed elevation of a building facade on the right side, showing a central entrance with a pediment and two side wings. The drawing is labeled with 'UNIVERSITAS ATMA JAYA YOGYAKARTA' in a large, stylized font across the center. Below the main elevation, there is a floor plan showing the layout of the building, including rooms and corridors. The drawing is titled 'KONSTRUKSI BANGUNAN' (Building Construction) and includes a title block with the text 'KONSTRUKSI BANGUNAN' and 'KONSTRUKSI BANGUNAN'.



## Lampiran 18 Brush Dimension



## Lampiran 19 Dimensi Slip Ring



## Lampiran 20 Link Video Cara Kerja Viledon Filter

<https://youtube.com/shorts/xbfTJaX52uw?si=SUMztjE5-hH7IN9y>