

Achieving HV Operational Excellence: Continuous Monitoring at G20 Summit

A real-life business case which took place at the G20 Leader's Summit in Bali, Indonesia. Outlining a start-to-end journey, from finding partial discharge to mitigating strategies and a successful resolution.



EA Technology's Astute High Voltage (HV) Monitoring system allows 24/7, continuous monitoring over HV assets and networks to prevent failures.



Figure 1: EA Technology engineers and onsite operators from PLN UPT Bali.

Continuous Monitoring at the G20 Summit

The Group of 20 (G20) Summit brings together the European Union and ministers from the world's largest economies including UK, US, Saudi Arabia and China to discuss pressing global issues. With a theme of "Recover Together, Recover Stronger", the 17th G20 Summit was hosted by Indonesia in Nusa Dua, Bali.

In collaboration with PLN UTP Bali – ULTG Bali Selatan, EA Technology is honoured to have our Astute continuous monitoring installed at a 22kV substation near the event to manage the electrical network and infrastructure at the G20 summit.

Partial Discharge Identified

After installation, data insights from Astute displayed signs of surface partial discharge (PD) coming from one of the panels - Panel 1.



Figure 2: Onsite operators opening up the identified area.

A shutdown was later conducted to investigate the root cause of high ultrasonic signals emitted by panel 1.

Locating the Source

The team was able to locate where ultrasonic signals were the strongest, indicating the source and location of PD. All data points to the anti-tracking sheds on the cable termination. See Figure 3 below.



Figure 3: Location where PD was detected.

Upon further detective work, PD can be seen developing along the sides of the anti-tracking sheds. See Figure 4.



Figure 4: Physical signs of PD on the anti-tracking sheds.

As these surfaces were pressing against each other, stress caused by prolonged contact could have led to the development of PD.

Removing the Source

Remedial action was taken by directly removing the anti-tracking sheds off the cable asset. This eliminated all identified areas of PD and as the surfaces are no longer in close contact, it prevents PD from reoccurring in the future.



Figure 5: BEFORE remedial action.



Figure 6: AFTER remedial action - anti-tracking sheds were removed.

Data Analysis - Successful Removal of PD

When the switchgear was re-energised, we can see that ultrasonic signals in Panel 1 dropped significantly; evidence that PD had been successfully removed. This drop can be seen in our graphical data in Figure 7.

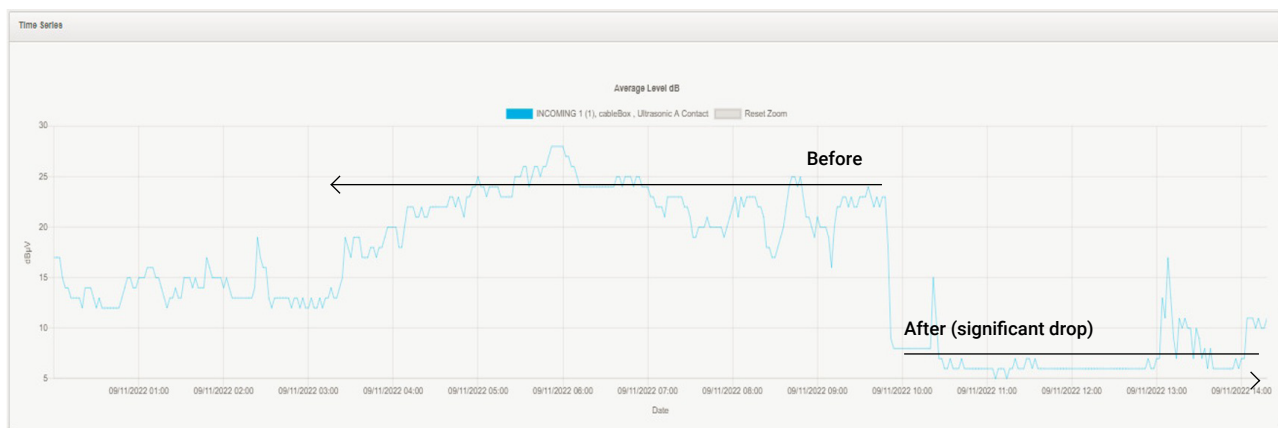


Figure 7: Graphical data report provided by Astute HV Monitoring.

The presence of PD can also be distinguished through sound, click on each icon to hear the sounds emitted by the affected asset before and after remedial action.



Before



After

There is a clear difference between the two recordings. A more distinct crackling sound can be heard before remedial action which indicates higher levels of PD.

Astute was able to detect signs of PD quickly and efficiently, averting chances of critical failures and costly damages. As this substation was in close proximity to the G20 Summit, any faults or downtime would have not only been damaging to the infrastructure but also, to the reputation of Indonesia as a host country for a large scale, global event.

By having technologies in place to pick up on the warning signs of failure, asset operators had sufficient time to plan and were able to carry out maintenance action. Furthermore, Astute was able to accurately identify the fault location, enabling efficient maintenance work.

Find additional information on Astute HV Monitor on our website. Demos are now available!



Letter of appreciation from the client



UIT JBM

Nomor : 4797/TRS.00.01/F36000000/2023
 Lampiran : 1 Set
 Sifat : Segera
 Hal : Surat Keterangan Sukses Operasi Uji Coba
 Alat Monitoring Partial Discharge (PD)
 Online Merk EA Technology UIT JBM

7 November 2023

Kepada

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Up. Yth : Direktur,
 Menindaklanjuti:

1. Surat PT MULTI INOVASI TEKNOLOGI nomor : L/002/III/23/OQ tanggal 13 Maret 2023 perihal Permohonan Surat Sukses Operasi.
2. Surat UPT BALI nomor: 0370/TRS.01.05/F36010000/2023 tanggal 05 Mei 2023 perihal Laporan Implementasi Astute HV Monitoring PD Online pada GI Nusadua & GIS Pecatu.

Bersama ini kami sampaikan bahwa implementasi uji coba produk Astute HV *Monitoring Partial Discharge* (PD) Online Merk EA Technology pada GI 150kV Nusa Dua dan GIS 150kV Pecatu wilayah PT PLN (Persero) Unit Induk Transmisi Jawa Bagian Timur dan Bali telah dilaksanakan dengan durasi monitoring 24 jam selama 44 hari (25 Oktober s/d 7 Desember 2022). Dari hasil rekaman pengambilan data PD *Monitoring* tersebut didapatkan data kenaikan *trending* indikasi *partial discharge* di kubikel *incoming* 20 kV Trafo 1 GIS 150kV Pecatu, selanjutnya ditemukan adanya anomali pada sirip kabel power 20 kV berupa *Flashover/ Burn Mark* dan telah dilakukan perbaikan. Dapat disimpulkan alat beroperasi/ berfungsi dengan baik.

Demikian kami sampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.



Tembusan:

1. SM HAR TRANS UIT JBM PLN
2. SM PENK UIT JBM PLN



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Global Footprint

At EA Technology we specialise in asset management solutions for owners and operators of power network assets.



Founded in 1966 we have over 50 years' experience in the industry and 6 regional offices around the world to support our global customer base.

We help clients to safeguard their networks. Advising them on strategy and implementation of a range of technology solutions to manage power assets, delivering maximum life and minimising cost.



Safer, Stronger, Smarter Networks

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