



Sertec S.R.L.
Soluciones inteligentes pensando en usted



Successful Case

AES-COLON

CMCE SERTEC

The most effective **lightning**
protection system



www.sertec.com.py

Information about AES

AES - COLÓN is the Natural Gas Power Plant that uses combined cycle technology for its efficiency and contribution to the environment. It reuses the heat from gas turbine exhaust gases to obtain steam, to be later used by steam turbines and saves on fuel consumption in the production of electricity.

It is the first Liquefied Natural Gas plant in Panama and the Central American region, it also has a 180,000 m³ LNG storage tank.



Fuente: <https://elcapitalfinanciero.com/wp-content/uploads/2018/02/AES.jpg>

The Problem

The plant was in a process of innovation and they made the decision to update the existing technology (FRANKLIN Rods) with the CMCE-SERTEC Electro-atmospheric Protectors in view of the good results obtained.

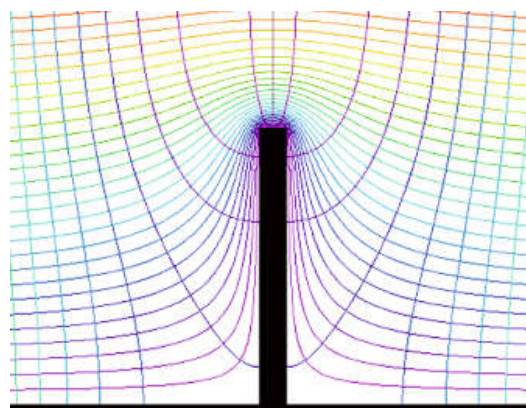
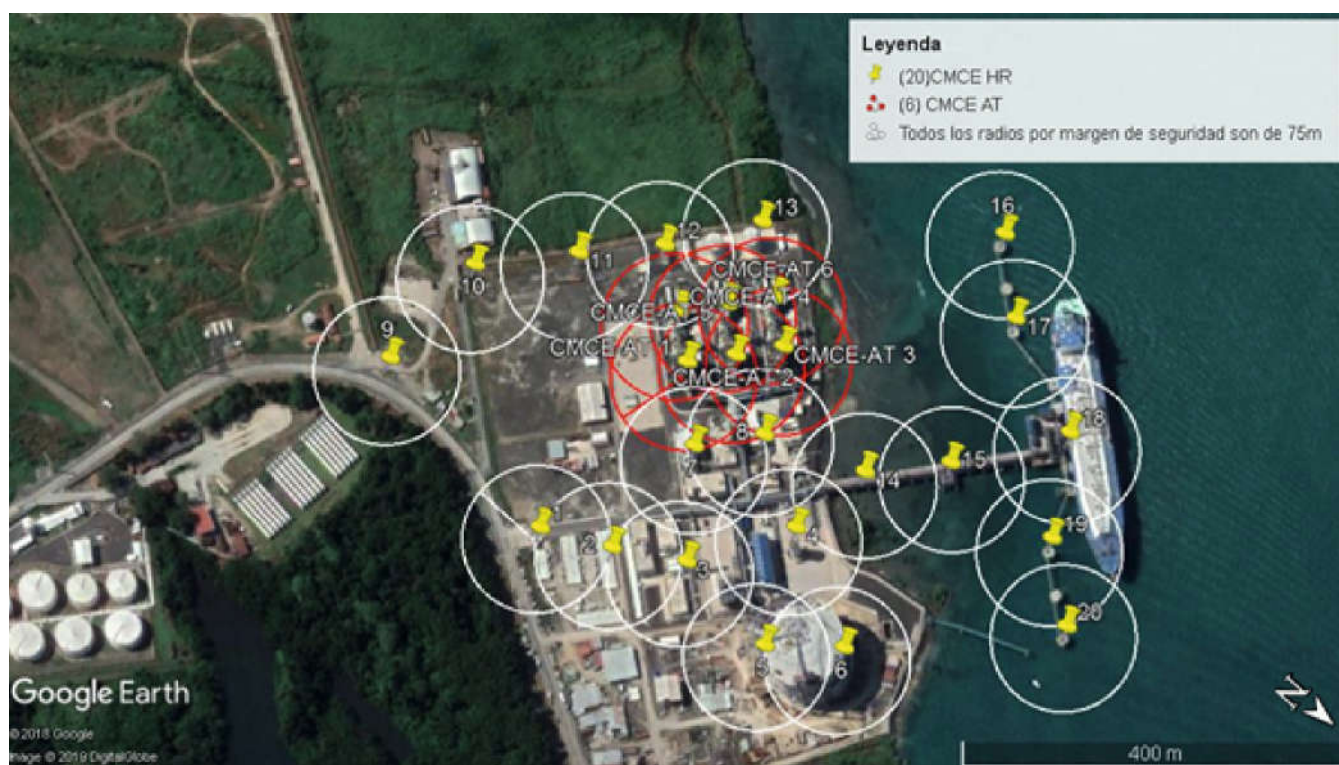


Imagen: Campo Eléctrico - Pararrayos Franklin
Fuente: <http://laplace.us.es>

Solution

Protection radius and strategic location

By opting for the technology manufactured by SERTEC S.R.L.; AES seeks to solve the problem by avoiding the formation of atmospheric discharges. Previously, they had conventional technologies that discharged the lightning to the ground and in the way affected the most sensitive electronic components, such as PLC, CCTV, ETC



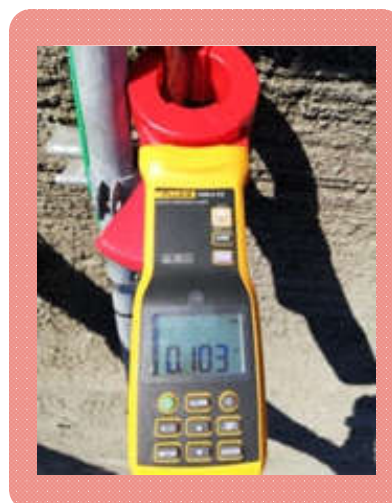
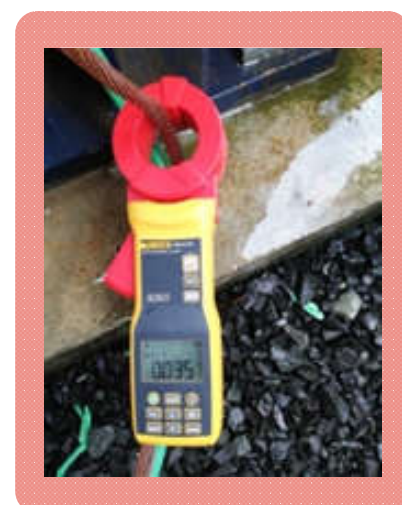
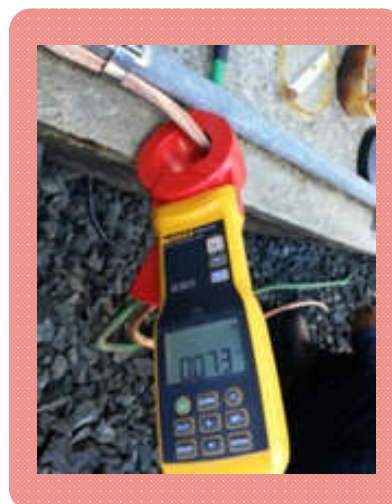
How the protection area was defined

The project covers the total protection of the productive part of the plant. For which 26 CMCE SERTEC were used to replace the 120 Franklin rods.

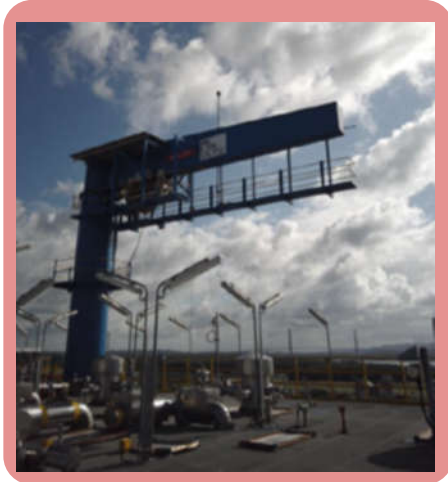
Measurement of the existing ground system

The plant had a grounding system, it was measured and the following data were obtained;

- Chimney 01 A - 0.283 Ω.
- Chimney 02 A - 0.050 Ω.
- Chimney 03 A - 0.044 Ω.
- Chimney 01 B - 0.032 Ω.
- Chimney 02 B - 0.047 Ω.
- Chimney 03 B - 0.035 Ω.
- High Voltage Tower 001 - 0.218 Ω.
- High Voltage Tower 002 - 0.036 Ω.
- High Voltage Pole 003 - 0.059 Ω.
- Electrical Substation Gantry - 0.033 Ω.
- Left end LNG tank - 0.038 Ω.
- Center LNG tank - 0.244 Ω.
- Right end LNG tank - 0.277 Ω.
- Diesel tank - 0.162 Ω.
- Water Tank - 0.073 Ω.
- Dock 1 - 0.103 Ω. Dock
- 3 - 0.095 Ω. Dock
- 4 - 0.114 Ω. Dock
- 6 - 0.160 Ω.
- Crane on Dock - 0.082 Ω.
- Bridge 1 - 0.049 Ω.
- Bridge 3 - 0.055 Ω.
- Administrative Building - 0.028 Ω.
- Powerplant building - 0.221 Ω.
- Entrance Light Post - 0.033 Ω.
- Workshop Light Post - 0.028 Ω.



Mounting the Device



Left end of LNG tank

Installation in Natural Gas tank

In it, 3 CMCE SERTEC devices were mounted, at both ends and in the center. This is due to the dimensions of the tank and to take advantage of the height and cover the bordering areas.



Right end of LNG tank



Center of LNG tank

Mounting the Device



Chimneys

The plant has 6 chimneys which emit steam at 450 ° C. Each of them is protected with a HIGH TEMPERATURE CMCE prepared to work in extreme heat conditions of up to 900 ° C.



Drain Measurement

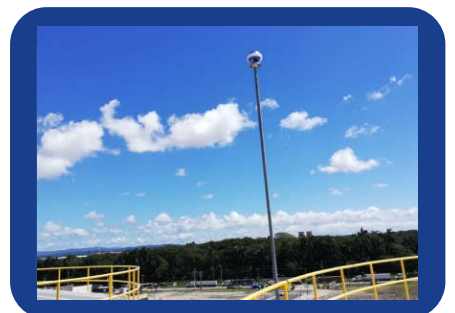
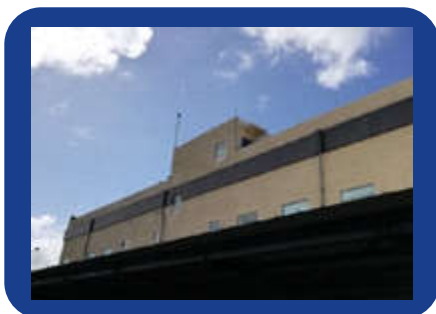


Low-range current clamps are used for load drain measurements. The measurement fluctuated between 1,737 mA and 0.569 A.

This solution was extended to several substations and transmission towers:

Conclusion: The AES-COLON Generating Plant was protected against lightning discharge with 99% effectiveness, no lightning to date.

- Chimney 01 A (9 ° 20'16.4 "N 79 ° 54'34.0" W)
- Chimney 02 A (9 ° 20'15.4 "N 79 ° 54'32.7" W)
- Chimney 03 A (9 ° 20'14.3 "N 79 ° 54'31.5" W)
- Chimney 01 B (9 ° 20'15.1 "N 79 ° 54'35.1" W)
- Chimney 02 B (9 ° 20'14.1 "N 79 ° 54'33.9" W)
- Chimney 03 B (9 ° 20'13.1 "N 79 ° 54'32.6" W)
- High Voltage Tower 001 (9 ° 20'08.7 "N 79 ° 54'32.2" W)
- High Voltage Tower 002 (9 ° 20'06.3 "N 79 ° 54'29.5" W)
- High Voltage Post 003 (9 ° 20'06.2 "N 79 ° 54'25.3" W)
- Electrical Substation Gantry (9 ° 20'11.0 "N 79 ° 54'34.2" W)
- Left end LNG tank (9 ° 20'22.0 "N 79 ° 54'28.7" W)
- Center LNG tank (9 ° 20'23.3 "N 79 ° 54'27.7" W)
- Right end LNG tank (9 ° 20'24.7 "N 79 ° 54'26.9" W)
- Diesel tank (9 ° 20'12.9 "N 79 ° 54'36.6" W)
- Water Tank (9 ° 20'16.1 "N 79 ° 54'30.0" W)
- Dock 1 (9 ° 20'29.6 "N 79 ° 54'33.4" W)
- Dock 3 (9 ° 20'27.4 "N 79 ° 54'35.4" W)
- Dock 4 (9 ° 20'21.6 "N 79 ° 54'40.2" W)
- Dock 6 (9 ° 20'19.3 "N 79 ° 54'42.1" W)
- Crane on Dock (9 ° 20'24.4 "N 79 ° 54'39.3" W)
- Bridge 1 (9 ° 20'20.5 "N 79 ° 54'32.4" W)
- Bridge 3 (9 ° 20'23.7 "N 79 ° 54'36.2" W)
- Administrative Building (9 ° 20'16.6 "N 79 ° 54'26.5" W)
- Powerplant Building (9 ° 20'16.6 "N 79 ° 54'31.6" W)



References of the work carried out



Corporate building



Crane on Dock



Crane in LNG tank



Dock



Light Post



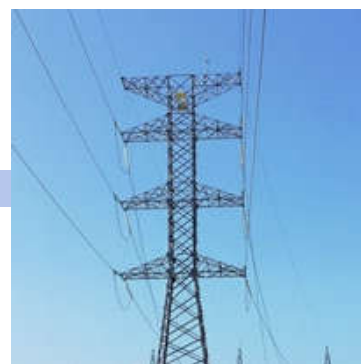
Bridge



Diesel Tank



Substation Portico



High Voltage Tower

The Final Client AES

Below are the contact details for reference purposes:

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Other references of similar application

CAL Y CEMENTO SUR S.A. - PERÚ

- Installation date: September 23, 2019
- Type of structure protected: 22.9 KV transmission line
- Location of installed CMCE: Caracoto, San Román, Puno



GERSA INTERCONEXIÓN ENEE - HONDURAS

- Installation date: April 8, 2016
- Type of structure protected: Interconnection towers
- Location of the installed CMCE: Chiquila, Santa Bárbara



GERSA INTERCONEXIÓN ENEE - HONDURAS

- Installation date: April 8, 2016
- Type of structure protected: Interconnection posts
- Location of the installed CMCE: Chiquila, Santa Bárbara



More References

CEPM - Dominican Republic

- Installation date: January - 2014
- Type of structure protected: private company in the electricity sector of the Dominican Republic
- CMCE installed: 24



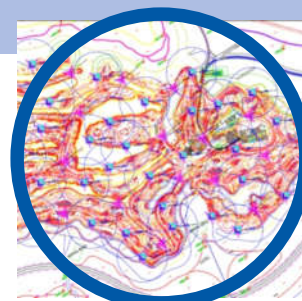
PARESA S.A. - Paraguay

- Installation date: February - 2014
- Type of structure protected: Company dedicated to the manufacture and sale of carbonated beverages from the Coca-Cola line.
- CMCE installed: 14



LPS PACIFICA - VIETNAM

- Installation date: In progress at this time
- Type of structure protected: GOLF COURSE
- CMCE installed: 50



Evidence of Success

Sertec S.R.L. issues a warranty certificate for each installation when it meets the requirements and protocols, as a document of conformity and certainty of operation, providing an insurance policy in cases of direct impact. The different warranties issued over the years, where the same policy has not been used for asset replacement costs due to damage caused by discharges, demonstrating that all projects have been optimally protected without lightning until date.

