

## TECHNICAL BRIEF



INCUBATENERGY  
LABS

### Substation Security, Safety, and Condition Monitoring

**Start Up:** Buzz Solutions    **Utility:** New York Power Authority

#### TECHNOLOGY SOLUTION

PowerGUARD allows for remote monitoring of substations for safety, security, and equipment condition. The solution uses artificial intelligence to detect events and deliver alerts to the appropriate personnel in near real-time.

For safety the solution monitors for injuries such as person down and alerts emergency personnel.

The security package provides insight into unauthorized intrusion events such as unauthorized vehicles, people, and animals.

Asset health and equipment condition is monitored through detection of smoke and fire, defects on porcelain and polymer insulators as well as thermal temperature monitoring of equipment.

Alerts can be sent via email, text, or viewed on a dashboard. These notifications can be customized to be sent to the relevant person or groups.

#### PROJECT OVERVIEW

Buzz Solutions provides its PowerGUARD solution which is an AI-based platform for visually monitor substation security, safety and condition monitoring using camera systems. PowerGUARD system aims to integrate with existing cameras installed by New York Power Authority (NYPA) at their substation facilities. After integration with these cameras, PowerGUARD's AI system will be recalibrated/retrained for NYPA's substation facilities. Once the algorithms are calibrated, the system will send out alerts for safety, security, and equipment condition.

#### RESULTS AND LEARNINGS

Buzz Solutions was able to successfully take camera footage from a NYPA substation and produce alerts onto the alerts dashboard. The AI models were calibrated to NYPA video data and successfully produced seven alert types to the dashboard. Through this process we learned that NYPA does not have an established protocol to connect to live camera footage. Another key learning was getting approval from NYPA security and substation teams took longer than expected as this is an entirely new request for footage for technological purposes and not investigatory. The AI models deployed for NYPA substation as part of the project included:

- Unauthorized vehicle intrusion detection
- Unauthorized person intrusion detection
- Animal intrusion detection (Trained from Gen AI)
- Personnel injury and person down detection
- Smoke and fire detection (Trained from Gen AI and synthetic data models)
- Insulator and insulator defect detections
- Thermal video feed ingestion
- Implications and Next Steps

NYPA is excited to receive this new data as they look to continue to improve their physical security, safety, and asset health at their substations. The next steps include expansion to other NYPA substations, refinement of models based on new data, and enhancement to the alert dashboard.



**Figure 1.** Person down detection by AI model. Source: Buzz Solutions



**Figure 2.** Alerts for synthetically generated smoke and fire at the substation. Source: Buzz Solutions

**ALERT ID SELECTED:** 0ee9e55b-5785-4dc6-8aa1-7c99ce5a2abc

Site ID	Camera ID	Alert ID	Alert Created (EST)	Alert Reported (EST)	Alert Type	Detection Type	View Alert	Actions
Clark Energy Center	CEC_Camera_11	0ee9e55b-5785-4dc6-8aa1-7c99ce5a2abc	12/16/2024 11:34 AM	12/16/2024 11:34 AM	Equipment Alert	Animal		

**Figure 3.** Alert dashboard displaying detected alerts for review by appropriate personnel including feedback. Source: Buzz Solutions

## TESTIMONIALS

*“An AI-based remote substation monitoring solution helps utilities to better secure and maintain their facilities and also helps in digital transformation. Buzz Solutions team was excited to work with NYPA and EPRI in demonstrating our PowerGUARD technology as an efficient solution for substation monitoring.”*

~ **Vikhyat Chaudhry**, Buzz Solutions

*“As a part of our integrated approach to security, safety and asset health of our critical infrastructure and over expanding asset base we partnered with Buzz Solutions and EPRI to pilot the AI based video analytics using Buzz PowerGuard solution. The pilot yielded excellent results, enabling us to explore additional use cases, particularly for our remote sites, and to build capabilities using our existing camera feeds. The layered approach of using video analytics along with manual surveillance, sensors and security intrusion detection systems provides greater insights and allow focusing on relevant events. NYPA is committed to leveraging these advanced technologies to boost efficiency while ensuring the protection of our infrastructure.”*

~ **Parikshit Daware**, New York Power Authority

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THE FOLLOWING ORGANIZATION, UNDER CONTRACT TO EPRI, PREPARED THIS REPORT:

### Buzz Solutions

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May 2025

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