



# HIGH VOLTAGE TESTING SOLUTIONS

*FROM MULTI-DISCIPLINARY TEAM OF ENGINEERS, ARCHITECTS, AND PROJECT MANAGERS*

ACS offers a full suite of services dedicated to high voltage testing. We provide comprehensive solutions for test facility design, construction, process equipment and instrumentation, as well as testing and data analysis services. Our experience encompasses every facet of designing and implementing systems for the delivery, handling, and dissipation of high voltage energy. We're dedicated to tailoring solutions that precisely match the diverse and exacting testing requirements of our clients. Our team of experienced professionals specializes in seamlessly integrating utilities, facilities, and equipment for projects of any size or complexity.



## WHAT IS “MEDIUM VOLTAGE VS HIGH VOLTAGE”

Many groups, such as utilities, consider medium voltage up to 62-72.5Kv and anything above that to be high voltage. Facility groups for most large facilities consider medium voltage 1,000V up to 35Kv and anything above that to be high voltage. ACS typically uses the 35Kv cut off to align with the common facility terminology and the definitions from IEC 60038.

The voltage that qualifies as “medium” or “high” differs based on the company’s experience with electrification.

Region	Standard	Voltage Class
Europe	IEC60038	Low Voltage Class (<1000 V) • 220, 400, 690 V
		Medium Voltage Class (1-35 kV) • 3.3, 6.6, 11, 22, 33 kV
North America	ANSI C84.1	Low Voltage Class (<600 V) • 208, 120/240, 480, 575 V
		Medium Voltage Class (600 V - 35 kV) • 2.4, 4.16, 6.9, 12.47, 13.81, 21, 34.5 kV

At ACS, we’ve learned from our extensive work with electrification projects that 1000v is the threshold that typically surpasses a client’s past experience and often exceed the capabilities of their local power company’s standard utility service. Thus, we approach any project requiring at least 1000v as a “high voltage” project.

We specialize in designing and constructing high voltage power distribution and test equipment, located on your campus, and tailored to meet your voltage, current, and power demands.



## POWER IN...

Your high voltage applications need dependable and safe power delivery. ACS experts identify the cost-effective and efficient strategies that ensure a consistent power supply and design the infrastructure to deliver it. We collaborate closely with local utility providers to meet your power needs. In cases where utility power falls short, our planning and design integrates utility power with independent electric sources, ensuring a resilient and uninterrupted energy supply.

## POWER OUT...

In high voltage projects, excess energy is a common outcome. Our facility and test system designs always incorporate a strategy for effectively managing this surplus power. With a diverse set of tools in our "Power Out" toolkit, we can tailor solutions to suit the specific conditions of each project, ensuring optimal efficiency.

- Load banks
- Return to utility
- Heat dissipation
- Power conversion

## Selling Power Back to the Grid

We assisted a client in sending the excess power generated from their high voltage testing back to their local grid. The rebate they earn on their utility bill covers the test program's fuel costs.

## DESTRUCTIVE TESTING

During abuse tests, nonstandard voltage and current levels are often needed to push components past endurance. With one client, we designed a controlled environment for testing transfer switches used in hospital installations. The local utility couldn't provide the power the testing required, so we installed a short circuit generator to supply power to the test space, which had to be isolated from the grid entirely.



## ACS HIGH VOLTAGE CAPABILITIES AND SERVICES INCLUDE:

- Systems and equipment design and build for
  - redundant loop feed distribution
  - high voltage facility distribution
  - process system power absorption
  - safety disconnect systems
  - protective relaying
  - integrated network metering.
  - integrated co-gen systems for
    - peak shaving opportunities
    - cost-effective endurance testing
- Test solutions for
  - AC and DC short circuit current testing
  - grid simulation
  - battery system charging and discharging
  - genset production validation
  - ultra high current DC battery simulation

## SAFETY IN A HIGH VOLTAGE ENVIRONMENT

High voltage testing poses significant safety hazards, primarily due to the potential for electrical shock and arc flash incidents. Existing safety equipment and protocols are insufficient for safe high voltage testing. Various safety measures and interlocks, such as remote initiation mechanisms, specialized PPE, vibration control, and physical barriers, are needed to protect people and facilities.



### OUR EXPERIENCE RUNS THE GAMUT OF PROJECT TYPES:

- Cell Renovations
- Controls
- Custom Software and Data Acquisition
- Equipment
- Facility Infrastructure
- Greenfield Design and Build
- Process Automation
- Scanning & 3D Modeling
- Studies
- Turnkey Projects

### MANAGING SUPPLY CHAIN FOR HIGH VOLTAGE COMPONENTS

As voltage levels and power capacity continue to rise, finding equipment and component vendors capable of meeting these demands can be challenging. Part of our expertise lies in identifying manufacturers at the cutting edge of technology. We work closely with these forward-thinking suppliers to address the challenges of pushing the boundaries of voltage and current, all while ensuring safety and compliance in our test environments.

### FULLY INTEGRATED SOLUTIONS

Designing and constructing a high voltage testing facility that prioritizes safety while also aligning with business objectives, requires deep understanding of the intricate challenges of integrating infrastructure, test cell, and equipment.

Our knowledge enables us to coordinate and integrate the facets of facility design, test cell engineering, and equipment selection, resulting in optimal performance, enhanced safety protocols, and cost-efficient high voltage testing.

### FUTURE PROOFING AS VOLTAGE AND CAPACITY GETS HIGHER

As new technologies develop, with growing power needs that are unclear, future-proofing a high voltage test environment requires flexible infrastructure and adaptable equipment. We help clients determine the right balance between adaptability and specificity in light of their goals and budget.

### WE PROVIDE TURNKEY AND INDIVIDUAL DELIVERABLES ENCOMPASSING:

- Front End Planning [FEP]
- Design and Engineering
- Facility and Equipment Integration
- Systems Integration/3rd Party Equipment Integration
- Pre-construction and Construction Management
- Program Management/Project Management
- Acceptance Criteria
- Commissioning and turnover

#### INFRASTRUCTURE AND UTILITIES

Ensuring the infrastructure can meet the rigorous demands of high voltage systems, encompassing electrical safety measures and environmental controls.

#### FULLY INTEGRATED SOLUTIONS

#### TEST CELLS AND STANDS

Engineering, constructing, and connecting a high voltage test cell demands precision in designing electrical systems while seamlessly integrating with control systems.

#### HIGH VOLTAGE DISTRIBUTION

Selecting specially rated equipment that's compatible with utilities and require skilled personnel for proper installation and integration.