INTEGRATED POWER SOLUTIONS FOR CRITICAL INFRASTRUCTURE APPLICATIONS

Ensuring 24/7 Reliability—Around the World, Around Your Needs

NORTHERN POWER SYSTEMS
power without limits

The Strategic Choice for Delivering Essential Power Wherever and Whenever It's Needed

Industrial development in the most challenging and remote areas of the world. Questionable reliability and uncertain availability of grid-supplied power. Ever-increasing power demands and grid security concerns in major metropolitan areas. Whatever the circumstance, from Alaska to Azerbaijan, today's energy users increasingly need highly reliable, unmanned power sources for a variety of critical infrastructure applications. The solution: an Integrated Power solution from Northern Power Systems.

For more than a quarter of a century, we have delivered rock-solid systems for customers in locations where power is unavailable, unreliable or insufficient: the oil company whose multi-billion dollar pipeline stretches across thousands of miles of barren continent; the telecommunications provider that depends on up-and-running cellular base stations and repeaters; the remote government installation providing a piece of a national security system.

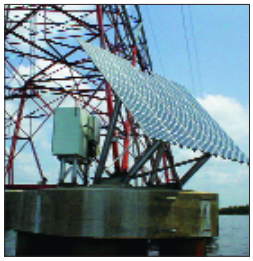
Whatever the application, Northern can develop an Integrated Power solution to address your specific field conditions and power challenges:

- Poor quality or non-existent power supply
- Limited or difficult physical access to the site
- Harsh, system-stressing environmental factors
- Inadequate or nonexistent infrastructure for power system housing and protection
- Remote monitoring and control requirements
- Energy storage requirements

Northern provides its unique power system expertise to a wide range of industries and applications, including:

Oil & Gas Infrastructure
Valve Actuation
Supervisory Control and Data Acquisition (SCADA) Telecommunications
Remote Telemetry (RTU)
Cathodic Protection
Injection Pumping
Security Lighting and Alarms
Fire Suppression

Telecommunications Infrastructure
Microwave Repeater Sites
Fiber Optic Regeneration Sites
Cellular Base Stations
Government Emergency Radio Networks
Obstruction Lighting



Electrical Transmission and Distribution
Obstruction Lighting of T&D Towers

Government/Military/Scientific
Seismic Monitoring
Data Collection and Transmission
Telecommunications

Expertise You Can Rely On

Northern Power Systems has the knowledge and expertise to develop, design, install and maintain the right solution for your business. From fossil fuel combustion turbines and reciprocating engines to the latest in fuel cells and renewable sources, Northern takes an open-technology approach to addressing your specific power needs. We combine a wide array of appropriate, proven technologies to meet your specific needs—on budget and on time.

Delivering Integrated Power Solutions for a Range of Needs

Whether your site is geographically remote or situated in an urban setting, you are faced with the challenge of addressing one or more basic, critical power-related needs. Northern Power Systems can tailor an Integrated Power solution to meet your specific objectives.

Business Objective	How to Accomplish It
Reduce Expenses	Cost-effective power that offers significant savings by managing and controlling installation costs and/or providing a lower cost, more reliable alternative to the existing power supply
Minimize Risk	Consistent, high-quality power that reduces the risk of power outages and disturbances which can disrupt service provision, production or operations, and reduce reliability and profitability
Ensure Long-Term Performance	Self-contained power that can withstand the stresses of harsh environments and extreme physical circumstances to maintain system efficiencies and minimize degradation of the overall system performance over time

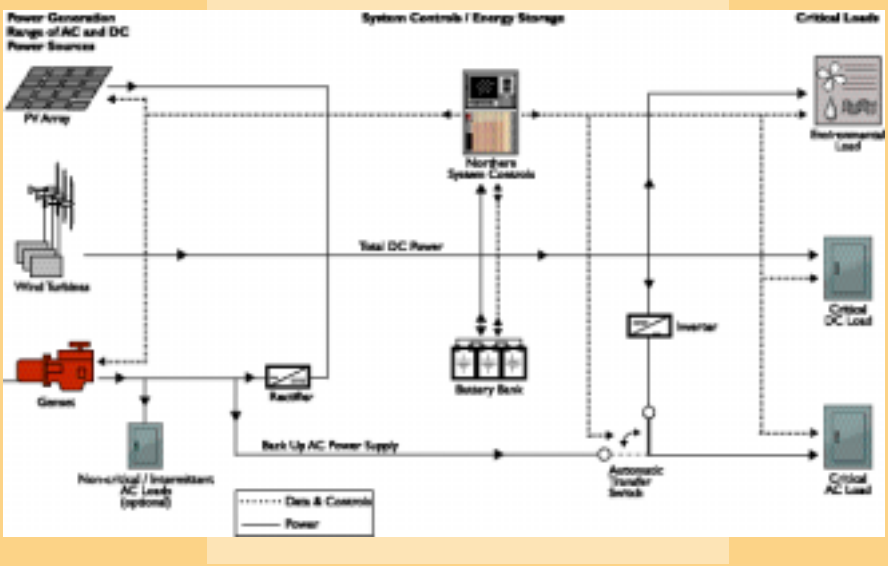
Comprehensive Family of Integrated Power Solutions

Whether you need reliable power available 24/7/365, cost-effective power, or self-contained power that addresses complex logistical and integration challenges, Northern has the solution. Our Integrated Power Systems deliver comprehensive prime or backup power to the most challenging and complex applications.

Stand-Alone Prime Power Systems

Stand- Alone Prime Power Systems generate power on site to address continuous load needs in remote locations not serviced by the utility grid. If the load consumes less energy than is being produced, the excess is stored in battery banks. When the load is consuming more energy than is being produced, the battery banks provide the additional power required. Northern's Stand-Alone Prime Power Systems offer the right combination of power generation and energy storage to cover the full range of applications and loads.

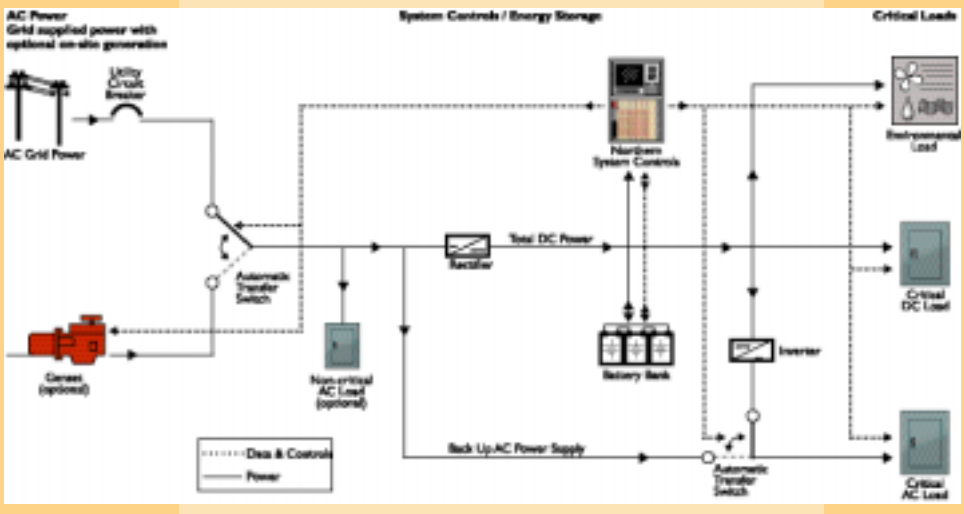
Stand-Alone Prime Power System



Grid-Connected Backup Power Systems

Grid-Connected Backup Power Systems utilize the utility grid to power the load and charge a battery bank, rectifying the incoming AC power to DC power to service DC loads and charge the batteries. In the event of grid power failure, the battery system powers the critical loads until primary power is restored. Transcending conventional Uninterrupted Power Supply (UPS) systems, Northern's GridTie™ Backup Power Systems combine battery backup with system controls and standby generators for a more complete solution.

Grid-Connected Backup Power System



Leveraging the Right Energy Sources and Power System Technologies

Northern's engineering staff has the depth and breadth of experience to take full advantage of all power technologies, enabling us to blend appropriate energy sources in combination with state-of-the-art controls and power electronics. The elements of an Integrated Power system are:

System Controls

With limited human access to the site, Northern's software and hardware control systems are designed to provide continuous monitoring, control and optimization for the life of the system. These system controllers are the smart-electronic "brains" that maximize system performance. They ensure that specific functions happen in an optimal manner based on all monitored variables and their interdependencies, adjusting the system as needed and protecting the overall system integrity.

Power Generation

Depending upon your site, application and the available energy sources, Northern can integrate a range of generating technologies into a custom hybrid system. These systems enable you to combine fossil fuel and/or renewable energy sources into a single power system, ensuring higher reliability. We work with the full range of energy generating technologies, including Reciprocating Engines, Microturbines, Renewable Energy Sources (Wind and Solar), Fuel Cells and Thermoelectric Generators.

Power Conditioning and Conversion

All power is not created equal. Depending upon the application, power often needs to be "conditioned" to meet the precise needs of its end use. No matter what the source (grid, photovoltaic panel, diesel genset, etc.), the type (AC or DC), or its initial voltage, Northern can provide a system to condition the power to meet your specific voltage and current needs. Whether your system requires rectifiers (AC to DC), inverters (DC to AC), transformers, or conditioning systems (to ensure power quality), Northern has the expertise to design and integrate all of the right elements.

Energy Storage

Battery power storage enables the system to run autonomously in case of primary power failure by collecting and storing excess energy that can then be used to supply power when demand arises or increases. Batteries are the heart of the system and the key to optimal performance; too little battery storage and your system may go down, too large and you are paying a premium for little added performance. Northern determines the size of the storage system based on your specific application: by the size of the load, the length of time the system may require autonomous battery power, and the battery charging source.

Environmental Systems and Housing

Given the extremely harsh conditions in many power infrastructure applications, the environmental systems and housing are critical. Since a battery bank is only as good as its environmental protection, we design the best physical shelter—considering such factors as weight, security and size—for the application. And we work to address key environmental requirements—such as temperature and air controls—to optimize conditions and maximize battery life. The result is an environmental system and housing design that addresses logistical challenges, provides the necessary protection, and handles all site factors to ensure efficient and reliable operation.

The Northern Approach: Addressing Your Unique Needs

Northern Power Systems works collaboratively with you from thought to finish. Rather than supply off-the-shelf packages that may only address some of your needs, we apply a rigorous methodology and supply a turnkey Integrated Power System that meets your unique objectives. The steps include:

- Site analysis
- Project and financial assessment
- Engineering studies
- Metering and data collection
- System engineering and design
- Equipment procurement
- System construction and site preparation
- Installation, commissioning, and staff training
- Monitoring and control
- Maintenance

NORTHERN
POWER SYSTEMS
power without limits

Contact Us to Find Out More

To find out how Northern Power Systems can help you design and commission an ultra-reliable Integrated Power System for your specific application, call us at **1-877-496-2955**. Or visit our website at **www.northernpower.com** and complete a brief on-line assessment of your own power needs.

Headquarters:
Northern Power Systems
182 Mad River Park
Waitsfield, VT 05673 USA
Phone: **1-877-496-2955**
Fax: **1-802-496-2953**

www.northernpower.com

Printed on paper made with 50% recycled fiber and 50% totally chlorine free (TCF) paper using timber from managed forests.