

MECHRON



ENGINEERING

COMPANY PROFILE

Mechron Engineering was formed in late 2011 by the engineering and management team from Mechron Power Systems, a Division of Toromont Industries.

Our goal is to be a leader in the design of power systems and controls for critical mobile and fixed applications in Telecom, Industrial and Military applications. Our engineering team has a combined experience of 150+ years in the design, manufacture, installation and commissioning of power systems throughout North America and the world.

Mechron Engineering is based in Ottawa, Ontario, Canada and has an office in the United Arab Emirates.

The Mechron Team has extensive experience in a wide variety of power generation systems installed in many locations. Below are sample projects demonstrating some of Mechron's capabilities, including:

- Customization of power generation systems and equipment for operation in difficult conditions, both stationary and mobile
- Management of complex technological and logistics programs at remote sites and in hostile environments and locations
- Collaborative and responsive design with prime contractors and end customers to develop solutions as needed to meet unique requirements
- Broad knowledge of electrical power generation and distribution systems, especially for military and telecommunications applications
- Extensive after sales support for consulting, installation, commissioning, maintenance, service, repair and overhaul of Mechron and other vendors' equipment

SAMPLE PROJECTS

Project: Design, Build and Installation of Electrical Power Generation and Distribution Systems for African Union Mission in Sudan (AMIS) and African Union/United Nations Hybrid operation in Darfur (UNAMID)

Customer: PAE Government Services WDC



Description:

Mechron personnel were involved in the design, supply of bulk and manufactured materials, transport and install of the electrical power systems for camps in support of the AMIS mission. The first phase consisted of 13 pattern camps, while the second phase consisted of 12 pattern camps, expansion to the existing camp at El Fasher, and the Forward Operating Base (FOB) at Nyala. The final phase involved the construction of “Supercamps” in El Fasher, Nyala, Zalingei and El Geneina. Camp sizes ranged from capacities of 200 to over 2,000 military, civilian and transient personnel, supporting a total of over 22,00 personnel in 32 locations. All phases of the project were executed under extremely short timelines. Mechron provided materials for the complete electrical systems including over 200 generator sets up to 750 kVA, over 1,000 km of cabling, power distribution panels, perimeter and area lighting, harnesses for tent and bulk electrical materials for building fit-up.

Project: Design, Build and Installation of Electrical Power Generation Systems for Canadian Department of National Defence, Camps Julien and Warehouse, Kabul, Afghanistan

Customer: SNC Lavalin-PAE, Kingston, Ontario



Description:

Mechron personnel were involved in the design-build services for the construction of electrical systems at two camps for the Canadian Military in Kabul, Afghanistan. In consultation with SNC Lavalin-PAE and the Canadian military on site, Mechron designed the camp power distribution system. These camps were named Camp Julien and Camp Warehouse and housed 1900 and 450 soldiers respectively. The camps required the installation of 50 km of power distribution cable, over 100 power distribution modules and 23 300-500kW generator sets and 7 separate fuel systems. Mechron personnel were instrumental in overcoming the inevitable layout and compatibility issues that arise in a new camp layout and installation in a hostile and changing environment.

Project: Canadian Department of National Defence North Warning System PLC Control Systems Upgrade
Customer: Nasittuq Corporation, Ottawa, Ontario



Description:

Mechron personnel have been an active participants in providing power systems for the Canadian Department of National Defence North Warning System since the original upgrade program in the 1990's. Mechron's most recent efforts in the North Warning System involve the upgrading of the power generation systems at 37 North Warning Short Range Radar sites from 1999-2001, followed by the recent program to develop upgraded PLC control systems for Long Range Radar sites. The majority of these sites are remote, unmanned and accessible only by helicopter. Due to the operational importance of these sites and the difficulty of transport in the high arctic, quality control and logistics management are important to the successful completion. An essential component of these projects was maintaining the sites operational during power systems upgrades.

Project: Parsons FAA – Juneau Wide Area Multilateration (WAM) System
Customer: Parsons FAA – Anchorage, Alaska



Description:

As part of its support contract with the FAA, Parsons-FAA is upgrading the navigation systems in the Alaska flight corridor. The Wide Area Multilateration System (WAM) is an enhanced radar system with multiple sites throughout the corridor. One of the Juneau sites for the WAM is located on a remote mountaintop south of the city, with no access to utility power. The site is subject to extreme environmental conditions, including high winds (130 mph) and heavy icing / hoarfrost conditions. As a result of a competitive tender, Mechron personnel were involved in providing the hybrid PV / propane generator power system to support the installation. Because of the requirement for helicopter lift to the site, the buildings selected were modular and capable of being assembled on site. Based on the success of the Juneau site, the remaining sites in the flight corridor system were also upgraded.

Project: 80 kW ISO Containerized Standby Power System for Algerian Air Force
Customer: Raytheon Systems Canada Ltd, Waterloo, Ontario



Description:

Mechron personnel designed and commissioned a custom self-contained 40' ISO Containerized Standby Power System for Raytheon for use by the Algerian Air Force. The power system consisted of an 80 kW Olympian standby generator set, 80 kVA uninterruptible power supply (UPS), 30 minute battery backup, self-contained fuel system and a comprehensive control system complete with extensive alarming. The extensive amount of equipment required for the system and the high ambient temperature operating requirement necessitated careful design of both the container layout and the ventilation system. Mechron conducted on-site commissioning of the system in Algeria.

Project: Auxiliary Power Units for Stryker Light Armoured Vehicle
Customer: General Dynamics Land Systems (GDLS), London, Ontario



Description:

As part of the development of the Stryker Light Armoured Vehicle for the US Army, Mechron personnel helped to develop an under-armour auxiliary power unit (APU) as part of the overall vehicle system design. The APU is an anti-idling device, powering the Stryker while the main engine is not in operation, reducing fuel consumption and maintenance requirements. The Stryker APU is a 3.8kW, 28 VDC liquid-cooled generator set designed for underhood operation in harsh environments, including temperatures from -50°C to +100°C and extreme shock and vibration. The APU is a fully integrated design, sharing its cooling system with the Stryker's main engine. This APU is equipped with an SAE J1393 CANBUS data / diagnostics interface for remote operation and diagnosis. The design was successful and 1,400 APUs were supplied to GDLS for installation on their production line.

Project: MRAP APU Prototype Developments
Customers: Joint Program Office (JPO) MRAP
US Marines Expeditionary Power
Systems
Redstone Arsenal



Description:

Mechron personnel designed a 14 kW DC APU for integration with Joint Program Office MRAP vehicles. The sample APU passed a wide range of temperature and altitude testing (MIL-STD-810F) and power quality testing (MIL-STD-705C) and was down selected for vehicle integration. Subsequent prototype APUs were supplied for the Cougar and Buffalo MRAPs, which were subject to further testing. These APUs were designed for extreme environmental conditions including operation while the vehicle is in motion, and featured hydraulic output suitable for driving a 35,000lb vehicle recovery winch. Based on the success of the MRAP APU developments, Mechron also developed 5 – 20kW APUs for testing purposes to the US Marines Expeditionary Power Systems Group and Redstone Arsenal.

Project: Hybrid CycleCharge™ Systems for
US Coast Guard
Customer: US Coast Guard, Juneau, Alaska,
USA



Description:

The United States Coast Guard (USCG) operates a series of unattended remote monitoring stations along the Alaskan Coast. The existing systems consisted of wide variety of hybrid power configurations, which had proven unreliable and costly to operate. Mechron worked with the USCG to design an upgrade to the existing system by replacing the prime power system with a hybrid system. When combined with the solar array, the hybrid system provides uninterrupted power with the minimum possible fuel consumption. When the solar array is unable to generate sufficient power to keep the station batteries charged, the auto-start generators operate when required to maintain the batteries above a predetermined level of charge. This approach maximizes battery life while minimizing generator set run time. The 17 sites were equipped with SCADA software, which provides complete remote operation, monitoring and data trending.

Project: Camp Victory, Baghdad, Iraq –
Telecom Infrastructure
Customer: Northrop Grumman Information
Systems, Manassas, Virginia, USA



Description:

Mechron personnel were involved in the design of the power system equipment and materials to support new telecommunications infrastructure at Camp Victory, Iraq. Two locations required unique solutions due to the amount of load and site conditions. The design had to meet local requirements and adhere to North American standards for safety and environmental protection.

Due to the shortage of US Army transport resources, we were also tasked with the transportation of all materials to site. This involved the coordination, export compliance and shipping of materials by air and land from Canada, The United States of America, The United Kingdom, Spain, and the United Arab Emirates to Camp Victory in Baghdad.

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