

Application/Problem:

An open pit phosphate mining operation purchased a portable 72" wide, 5500 feet long conveyor to expand their bucket-wheel operation. The mine was in need of someone to provide the electrics, both power and control, to operate this conveyor while also having the ability to communicate with the other conveyors in the system extending from the bucket-wheel to the spreader. The equipment needed to be portable, heavy mine-duty construction, and able to withstand hurricane-force winds and an acidic atmosphere.

Project Solution/Customer Benefit:

Flanders Electric worked in partnership with the mine electrical personnel to develop a list of auxiliary equipment that needed to be included in the project along with a communication system compatible to their existing system.

Flanders Electric fabricated an insulated, portable skid-mounted E-House made with 3/16" V-crimp type painted steel external walls. This house was the central control for operation of the conveyor and contained 4,160 volt power components, 480 volt auxiliary items, internal and external lighting, a HVAC system, an industrial computer, and a GE 90-30 PLC system. The new conveyor required (4) 500 hp, 4,160 volt wound rotor motors for operation. Medium voltage vacuum contactors and load break switches along with a Multilin 269+ motor protection circuit were provided for the primary of the motors. Identical sets of secondary resistors for the (4) motors were installed on both the top of the E-house and on the conveyor. Shorting vacuum contactors were mounted inside the E-house for each of the 6 required starting steps per motor. A step-down 4,160 VAC to 480 VAC transformer was installed within the house along with a (5) vertical section MCC to operate various auxiliary equipment.

All of the electrics were controlled by the 90-30 PLC in combination with the on-board computer. A touch screen provided manual operation and monitoring of the various systems. GE Genius blocks were installed in stainless steel enclosures and mounted at various locations along the conveyor for operation of devices located external to the E-House.



All drawings, mechanical and electrical, were provided as part of this project.