U.S. Coast Guard Base Kodiak
Repair Electrical Equipment at
N11 POL Facility
Kodiak, Alaska
Project No.: 8405333

Final Construction Documents

For:
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Seattle, WA 98174

September 27, 2021

Design Alaska

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U.S. COAST GUARD BASE KODIAK
REPAIR ELECTRICAL EQUIPMENT AT N11 POL FACILITY
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FINAL CONSTRUCTION DOCUMENTS
DESIGN NARRATIVE

EXECUTIVE SUMMARY

Site visits were performed at Building N11 over a period of two days in October of 2018 and two days in May of 2021. The installations of the existing oil water separator, control panels, power panel, generator connection, alarm panel, and leak detector panels were evaluated during a walkthrough of the site where the May 2021 visit took a closer look inside of all the panels at the site. Onsite personnel indicated they would like to have the replacement controls duplicate the functions of the existing controls and keep them very simple.

The existing panels' plans and information regarding the installed equipment and control sequences for N11 were reviewed. The USCG needs for the facility were also discussed. A fueling facility operation manual was provided, (2005 version) which has specific operational information about the fueling operations and these documents were also reviewed as part of the design process. All of this information was compiled and worked into the design documents.

The existing control panels as currently installed for tank level control, control valves, pumps, lighting, immersion heaters and heat trace, OWS monitoring, fire alarm panel connections, liquid/hydrocarbon sensor panels, and generator connection are not conformed in any single plan or manual. The current installation and functional understanding of the system is described within the schematic documents. Operational requirements and functionality of existing controls and alarms are provided in the Alarm and Control matrixes.

Summary of Scope Items

1. Provide fiberglass enclosure for new/relocated control, electrical, alarm, and leak detection equipment.
2. Relocate necessary control and other related equipment to new fiberglass enclosure in accessible area adjacent to Building N11.
3. Provide heat detection in existing Building N11 and new control enclosure with alarm signal transmission to central receiving stations.
4. Provide a standalone electrical panel for control panel power, Building N11 and site lighting, fuel separator immersion heaters, fuel separator heat trace, and fiberglass enclosure heating.
5. Existing equipment at current outdoor location will be modified as necessary to accommodate the relocation of these systems to the new equipment enclosure. Some of these enclosures will remain as termination points for new power/control cables.
6. Mount a manual alarm pull station at the exterior of the new enclosure.
7. Relocate generator power inlet to location more accessible by roll up generator and install new power inlet to replace existing. Existing electrical meter and manual transfer switch to remain as is otherwise.

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Functionality of the fueling operations will be maintained as much as practical during construction and carefully staged and phased to allow for an orderly transition from existing systems to new. The 6-foot by 5-foot control enclosure will be sited and secured on a gravel pad on the back side of building N11. Controls that are required for fueling operations will be left in place as much as possible during construction. This includes primarily the level sensor controllers (six total), tank control valve (receive/issue), and pump G-5 on/off control.

Table of Fueling Operation Control Functionality at N11 POL During Construction

Control	Online	Offline	Notes
Level Sensor – N10	✓		
Level Sensor – N12	✓		
Tank Selection – Receive	✓		Control Valve – Manual override capable
Tank Selection – Issue	✓		Control Valve – Manual override capable
G-5 Transfer Pump	✓		
High-High Level Alarm – Audible	✓		
Site Lighting		✓	Summer Construction – Limited darkness
N11 Lighting		✓	Summer Construction – Limited darkness
Fuel Separator Immersion HTR		✓	Summer Construction – Heating not required
Fuel Separator Heat Trace		✓	Summer Construction – Heating not required
Manual Pull Station Alarm		✓	Limit off-line period
Leak Detection Sensors (x2)		✓	Manual observation during construction
Tank High-High Alarm		✓	Currently transmitted to central monitor?
Generator Disconnect		✓	

It is assumed construction will take place in summer months when site/building lighting and fuel heating is not required. Immersion heaters and heat trace will also be off-line during construction.

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Work Plan

Enclosure Power and Existing Panel Relocation

With the new enclosure located behind the N11 building, the existing service meter/disconnect and manual transfer switch will be utilized. Three phase 208Y/120 volt utility power will be connected to new equipment enclosure Panelboard A. The existing transfer switch will remain, but the generator inlet will be moved to the new location where a roll up generator will have better access to it. With the new enclosure containing new systems and components which are similar to the existing systems, these can be installed and pre-commissioned prior to a cut-over of specific circuits during this transition. This method of phasing will provide the capability from both existing and new equipment and related systems to maintain availability for transition of circuits/systems with shorter scheduled outages for these control or power systems.

The existing Panel 5 (Leak Detection) will be relocated to the controls enclosure and powered from Panelboard A. The existing King-Fisher Alarm Panel 4 (alarming) will remain in place throughout much of the transition period so there will always be an active alarm panel in place for the connected systems. A new similar King Fisher alarm panel and antenna system will be provided within the new equipment enclosure ready for connection and/or re-connection of alarmed circuits as they are installed at the site. This will allow each of these systems' alarm functions to be transitioned off the existing alarm panel one by one until all circuits are connected to the new alarm panel. Once this transition occurs, the old equipment may be salvaged by the owner for use as spares or at other locations at the base.

Enclosure will include switched LED lighting within the interior of the enclosure and an electric unit heater to be provided for the enclosure to reduce the effects of humidity for equipment in the enclosure.

Control and power will be re-configured from the new control enclosure to a point at Building N11 or other termination points as indicated in the drawings. The conduit will be installed exposed on Building N11 to Panel 2 and other liquid tight junction boxes near the exiting panel locations. Control and power wires/conductors will be pulled through conduit and/or wireway as appropriate termination locations.

Transfer of Control – CP-1 Installation

The new control panel, CP-1, will be provided with new level controllers (Scully Signal Co.), pilot lights, switches, and push buttons to accomplish the existing fuel operation control functions as indicated in the control matrix, see drawings. The control panel wiring will be complete and to a terminating point near Panel 2 where level sensor and control valve wiring enters control Panel 2 from conduit leading through the containment berm. Other functions listed in the table above should already be connected, tested and reestablished.

As Panel 2 will remain as a terminal enclosure, this enclosure which still require power will remain in place.

At a convenient point during construction, possibly after a fueling receipt (allowing a period of time to complete the work), the level sensors and control valve selector controls will be terminated within Panel 2, and transfer pump G-5 power can be switched to the new power feed from the control enclosure. Unused level sensors, wiring, conduit, and panels may now be removed from the area.

EXISTING PANELS

Building N11 houses water separators, piping, valves, and a fuel transfer pump for receiving and issuing fuel between fuel storage tanks on base. The control for many of these features, including tank valves and level sensors, are from a set of outdoor power and control panels that serve the facilities operations. There are five panels plus a manual transfer switch with a generator inlet connection. A panel depiction is provided for description purposes, some of the panels or enclosures do not have a current designation or tag but are identified as they appear within the construction drawings.

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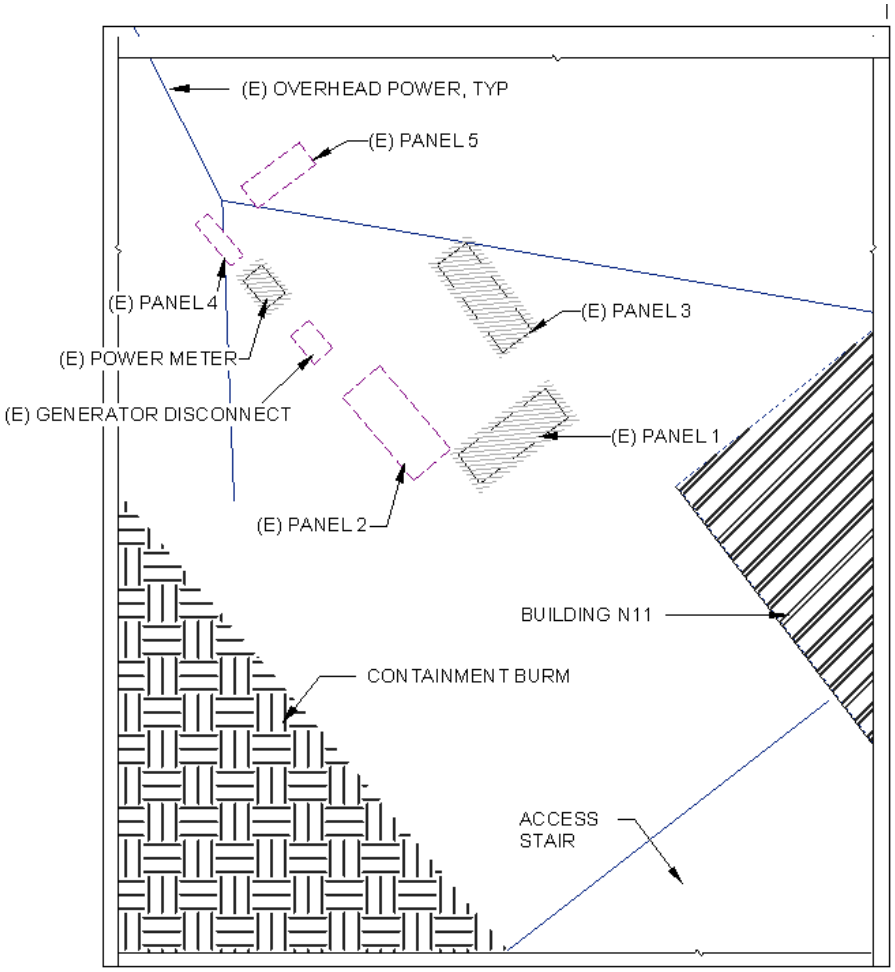
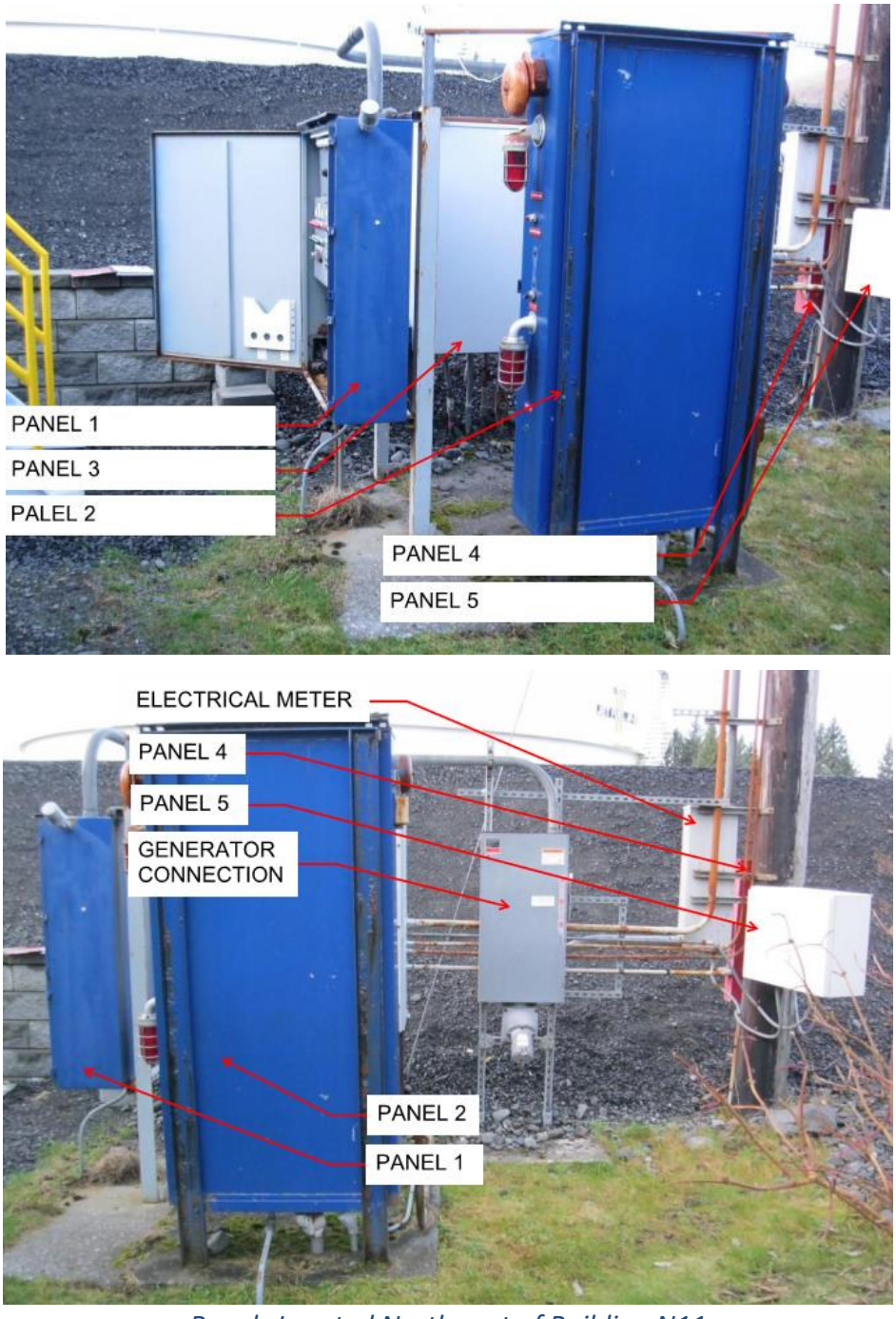


1. Panel 1 - Tank Level Alarms, tank control valve selectors, Pump G-5 On/Off Control, N11 Lighting Control Electrical Power Panel, Pump Contactor.
2. Panel 2 - Electrical Power Panel, immersion heater and heat trace, Turbidity Meter, Oil Water Separator Level Alarm.
3. Panel 3 – Tank Level control and alarms (Scully Controllers), power junctions, terminal strips.
4. Panel 4 – Alarm Panel (King-Fisher) with manual alarm pull station.
5. Panel 5 – Hydrocarbon Liquid Alarms (Veeder Root).
6. Manual Transfer Switch with Generator Connection.
7. Electrical Meter (with Main Disconnect).

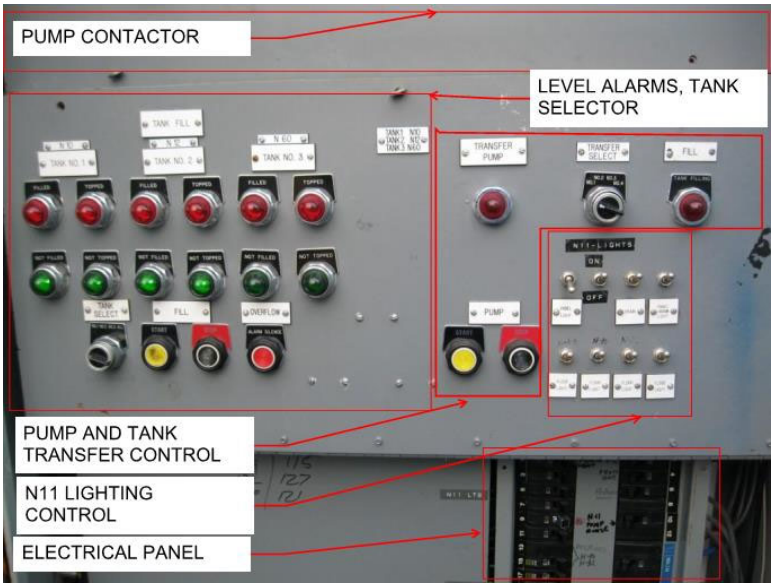
The following pages include descriptions of these systems along with photos (some annotated) of the existing systems and equipment.



Panels Located Northwest of Building N11

PANEL 1

The 'master' control panel has tank level alarm lights, a 'topped' condition audible alarm, fuel receive control valve selectors, fuel issue control valve selectors, and fuel issue pump G-5 on/off. There is also an electrical power panel and a contactor (pump G-5) within the panel. Lighting controls for Building N11 are also located within the panel along with others.



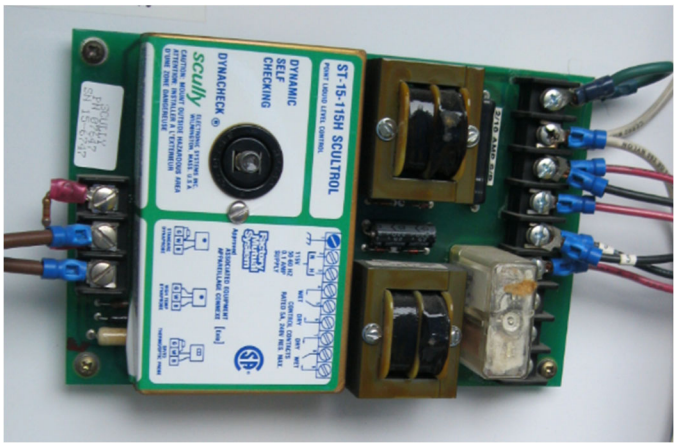
Panel 1: Interior View

Panel 1: Electrical Panel

PANEL 2

This panel houses the tank level controllers and connections for fuel tank N10 and N12 for level sensing. Level signals are sent to Panel 1 indictor lights. This panel also has electrical power terminal blocks and a 'strip' heater for panel heating. Panel 3 is sub-fed from Panel 1 where Panel 2 acts as a junction box. Pump G-5 (fuel transfer) is fed from Panel 1 and Panel 2 again acts as a junction box.

Panel 2: Interior View

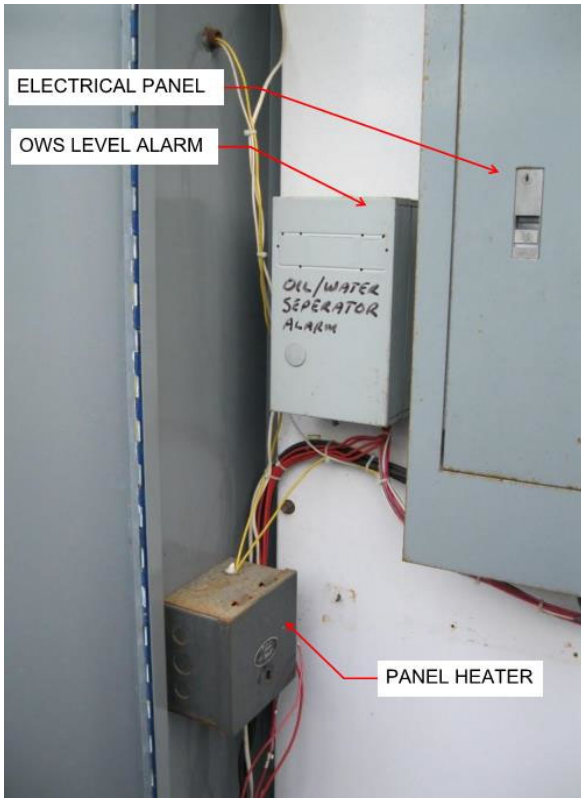


Panel 2: Level Sensors

PANEL 3

The panel housed an oil water separator liquid alarm and an electrical panel along with disconnected wires. The oil water separator alarm is connected to the fire alarm panel. It has been determined the oil water separator collection tank has been decommissioned and this alarm point is no longer active.

An electrical panel with breakers serves immersion heaters in the fuel separator and heat trace on the fuel lines serving fuel separators within Building N11. There was a disabled "turbidity" system with alarm light/horn housed in the panel at one point, however, it appears to have been removed. Operators indicated the turbidity system is no longer in use and will not be transferred to the new controls enclosure.



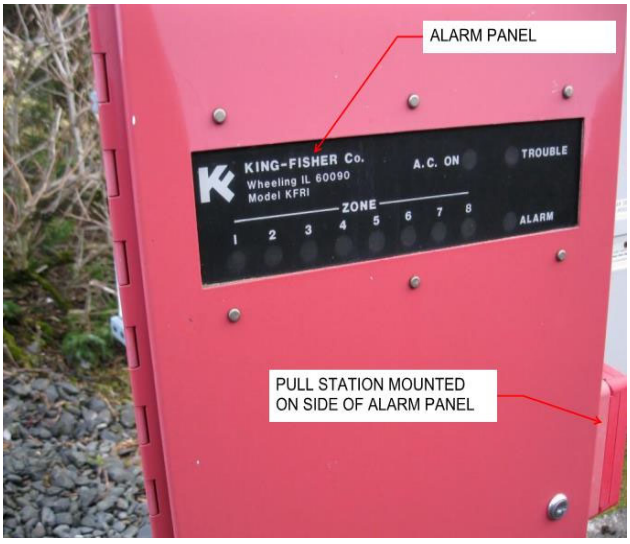
Panel 2: Interior View

Panel 2: Electrical Panel

PANEL 4

An alarm panel (King-Fisher) is located on a power pole adjacent to the electrical meter/main disconnect. It acts as a fire alarm control panel that handles local sensor inputs. It also passes alarms through radio communications to the central receiving stations (four of them). A pull station is connected to the side of the panel allowing operators to notify the central monitoring station with a single device. The alarm panel also receives alarm signals from the leak detection system (Panel 5) and oil water separator (Panel 3).

Panel 4: Fire Alarm with Pull Station



Panel 4

PANEL 5

The panel is located on the east side of the power pole near the fire alarm panel. It receives inputs from liquid sensors within the tank diking that detect water and hydrocarbons. There is a connection to the alarm panel and liquid alarms are passed to the monitoring stations.

Panel 5: Liquid Sensor Panel

Panel 5: Interior View

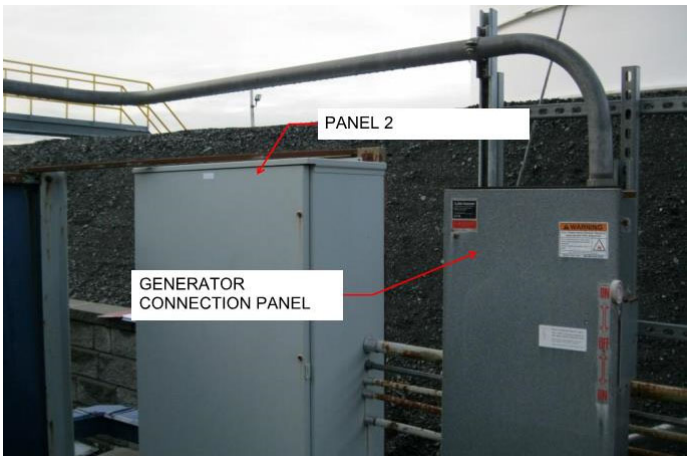
EXISTING METER DISCONNECT

In the previous design, the equipment enclosure was to be relocated to the opposite side of N11, however this was changed to place the new equipment enclosure closer to the existing equipment. As such the existing meter/disconnect and service to remain as is for feeding the new equipment at the site, including the new equipment enclosure.

Existing 100A 208Y/120V Meter/Disconnect and Overhead Service Feeder

GENERATOR CONNECTION

There is a generator connection point with a disconnect located adjacent to Panel 2. This allows temporary power to be connected, if necessary, for fueling operations at the facility if/when normal power is lost. Power is routed to an electrical meter/main disconnect. This transfer switch will stay as is to power the new equipment enclosure. The generator connection will be relocated to a position on the other side of the stairway to the tank dike area to allow easier connections to a roll-up generator when needed.



Generator Connection Panel

Generator Connection – (To Be Relocated and New Inlet Connection)