Generator Docking Stations

Covering throughout this presentation

- What is a Docking Station
- Where are they most commonly found
- What are the correct Listings for docking stations
- Where do they fall under in the NEC
What is a Docking Station

- Enables the ability to quick connect to a building or facility
- Ensures additional back up options beyond UPS systems
- Provides redundancy to permanent generators
- Opens up options for non-critical load services to be powered up
- Quick and easy access for load banking
- Supply’s an option for portable power to be quickly disconnected once utility power is restored.
Generator Docking Stations

Transfer-switch-No permanent
- GDS
- Contractor Grade
- GRUB Box

Existing Permanent Gen. on site
- Breakered Docking Stations
- Dual Purpose Docking Stations

No method of Transfer
- Trystar Access Panel
- Rotary Docking Station
- Retail Docking Station
Various Switching Methods

- **Automatic** – Docking Station is wired to ATS and setup with 2 wire auto start, 120V outlet for battery charger and block heater. If intercepting utility feed, the switch must be Service Entrance Rated with a Main Breaker. No amperage restriction.

- **Manual** - Docking Station and manual transfer-switch are in one common enclosure. If intercepting utility feed, the switch must be Service Entrance Rated with a Main Breaker.
Generator Categories

- Permanent: On-site all of the time
- Portable: Stored off site
Portable Generators

Generator – Where are you going to get the generator

1. Rent it – Need a contract to guarantee it’s there when needed
2. Own it – Need a place to store and maintain in
3. Hook up – Pre-plan on how you are going to connect it
Safe and code compliant connection/disconnection

- Plan on how to hook it up and unhook it
Generator Docking Stations, applications that have a transfer-switch, permanent generator or both

- GDS- Used to safely integrate a portable generator or load bank into and existing electrical system that already has the necessary switching means available.
GDS One Line

For use with an ATS, the GDS is a quick connect point
Agencies, which one is correct?
LISTINGS, Which one is correct?

1008A

891

50

508A

1640

1773
This standard applies to enclosures for electrical equipment intended to be installed and used in non-hazardous locations in accordance with the Canadian Electrical Code, Part I, CSA C22.1, the provisions of the National Electrical Code, NFPA 70, and the provisions of Mexico's Electrical Installations, NOM-001-SEDE, as follows:

Enclosures for indoor locations, Types 1, 2, 5, 12, 12K, and 13; and

Enclosures for indoor or outdoor locations, Types 3, 3R, 3S, 4, 4X, 6, and 6P.
These requirements cover industrial control devices, and devices accessory thereto, for starting, stopping, regulating, controlling, or protecting electric motors. These requirements also cover industrial control devices or systems that store or process information and are provided with an output motor control function(s). This equipment is for use in ordinary locations in accordance with the National Electrical Code, NFPA 70.

These requirements cover devices rated 1500 volts or less. Industrial control equipment covered by these requirements is intended for use in an ambient temperature of 0 - 40°C (32 - 104°F) unless specifically indicated for use in other conditions.
This Standard applies to switchboards nominally rated at 600 V or less and intended for use in accordance with the Canadian Electrical Code, Part 1 (CE Code, Part 1), the National Electrical Code (NEC), ANSI/NFPA 70, and the Mexican Standard for Electrical Installations (Utility), NOM-001-SEDE.

In this standard the term switchboard is intended to refer to a dead-front switchboard. These requirements do not cover the following switchboard types: preset and dimmer control (theater), live front, railway control or electrification; or constructions intended only for receiving motor control center units.

These requirements cover switchboards for use on circuits having available rms symmetrical short-circuit currents of not more than 200 000 A.
1.1 This standard applies to:

- Automatic transfer switches;
- Manual or non-automatic transfer switches;
- Closed transition transfer switches;
- Hybrid transfer switches;
- Transfer switches for fire pumps;
- Bypass/isolating switches;
- Softload transfer switches;
- Transfer switches intended for use as service equipment; and
- In Mexico and the United States, branch circuit emergency lighting transfer switches (BCELTS). In Canada, this requirement does not apply.
- that have a maximum rating of 1000 volts for use in non-hazardous locations, in accordance with Annex a1, Item 1.
These requirements cover portable power-distribution equipment intended to distribute power in accordance with the National Electrical Code, NFPA 70 (NEC).

These requirements cover portable power-distribution equipment intended for use in the following locations:
- Carnivals, circuses, fairs, and similar locations in accordance with Article 525 of the NEC;
- Exhibition halls in accordance with Article 518 of the NEC;
- Motion picture and television studios and similar locations in accordance with Article 530 of the NEC;
- Theaters, audience areas of motion-picture and television studios, and similar locations in accordance with Article 520 of the NEC; and
- Temporary installations at construction sites in accordance with Article 590 of the NEC.

These requirements do not cover portable power-distribution equipment intended to be mounted above or adjacent to the lighting unit it supplies.

These requirements cover power-distribution equipment rated 600 volts or less and 1600 amperes maximum. They may be intended for either single- or multi-phase supply.
UL 1773 TERMINATION BOXES

These requirements cover termination boxes rated 600 V or less that consist of lengths of bus bars, terminal strips, or terminal blocks with provision for wire connectors to accommodate incoming or outgoing conductors or both and are intended to be used in accordance with the National Electrical Code, NFPA 70. Termination boxes are investigated for use on the line or load side of service equipment.
Generators fall into 2 systems

- Separately Derived System

An on-site generator having transfer equipment with a switched neutral conductor or no neutral at all is considered a “separately derived system.”
Not a Separately Derived System

The neutral conductor must be sized to carry the neutral and fault current [250.30(A)(1) and 220.61].
Rotary Docking Stations, applications that have neither a transfer-switch or permanent Generator

- Utility-Off-Generator, up to 1200A (soon 3000A)
- Option for Service Entrance Rating
- Same Cabinet as our large GDS
- Handle is inside or outside mounted
GDR One Line

A Manual transfer-switch all in 1 unit. Source A – Off – Source B
You don’t have to settle for ANSI Gray anymore
Retail Docking Stations

- Kirk Key option as transfer method
- Comes with a breaker
- Dual inputs cam lok and hard wire
Safety through Kirk Keys

- Prevent back-feeding utilities, improper hookup (wrong rotation, phase to ground, etc.)
Kirk Key Access Generator Docking Station

- Kirk ® key is on the building’s main breaker, and captive
- To release key, turn main to off. This releases the only key that will unlock the Generator Docking Station.
- The key in the Generator Docking Station remains captive until the GDS is closed, and locked, and all cable is removed.
Permanent Generator Need

- To be able to pick up the entire building load (can use means to load shed but need to be automatic)
Safety with disconnects

- Needs to disconnect the utilities to prevent back-feeding
Need to do routine checks (oil change, coolant checks, load bank, etc.)
Generator & Load Bank and GDS

- Primary use is for Load Banking
  - Eliminates long and difficult connection points
  - Reduces the total amount of time a customer is without a back up generator

- Secondary use is for bringing in a portable
  - In the event you lose the primary permanent generator
  - If you have to service a permanent during a extended utility outage
  - Backing up the permanent during a load bank test.
Breakered Dual Purpose Docking Stations

- Utilizes Kirk Keys
- Applications where there is a permanent generator
- Simultaneous load banking and standby generator
- Load bank connection point, and portable connection point
DBDS-SBDS
One Lines

TRYSSTAR
Single Breaker Docking Station with Loadbank Connection and Kirk Key Interlocked Temporary Generator Panel Mounts

TRYSSTAR
Dual Breaker Docking Station with Loadbank Connection and Kirk Key Interlocked Breakers
3 NEC Articles that cover common generation systems

- Article 700
- Article 701
- Article 702
Article 700-Emergency Systems

Hospitals, health care facilities, large assemblies, etc.

- Rules that need to be followed in these locations are:
  - Provide power in 10 seconds automatically
  - Two (2) hours of fuel supply
  - Automatic connection
  - Test periodically
Article 701-Standby systems

Sewage Plants, Water Plants, Communication facilities, etc.

- Rules that need to be followed are:
  - Provide power in 60 seconds automatically
  - Two (2) hours of fuel supply
  - Automatic connection
  - Testing periodically
Article 702-Optional Standby Systems

- Article 702 deals with optional standby systems (All other types where the power is to protect property, not life. Examples – Heating Systems, Data Centers, Farms, Gas Stations, etc)

- Rules to be followed:
  - Can be manually automatically hooked up (no time limit)
  - Can be portable or permanent
Mounting to transfer-switches
Docking Station Features to consider

- **Aluminum or Stainless Steel Construction**
- **Phase Rotation Monitor** – Indicates correct phase rotation of generator hookup for phase sensitive equipment such as ac, chillers, and pumps.
- **Power Outlets** – When required for battery chargers and block heaters.
- **2 Wire Auto Start** – Starts the back up generator in the event of utility loss.
- **SCADA** 2 or more generators synchronized/paralleled with a PCS.
- **TVSS** – Surge Suppression.
- **Utility Lights** - Shows when utility is back up and available while running on generator power.
Docking Station Features to consider