Complying with New Florida Backup Power Rules
John Sharpe
Power Solutions Manager
Generac Power Systems
Darrell Sanford
Account Manager – North
Genset Services, Inc.
Jason Carpentier
Associate
JLRD Consulting Engineers
Mike Linden
Vice President
JLRD Consulting Engineers
Genset Services

Founded in 2003, located in Pompano Beach, FL.

Authorized Generac sales and service distributor for Southern Florida

Sole focus in power generation sales and service

Major emphasis of company is servicing and maintaining power systems for hospitals throughout south Florida
JLRD Consulting Engineers

Founded in 1991, based in West Palm Beach, FL

Our goal is to provide safe, cost effective engineering solutions utilizing state-of-the-art technology, innovation, and partnership, maximizing value for our clients

LISTEN – EVALUATE – COLABORATE – SOLVE
Lourdes McKeen Residence

Located in West Palm Beach, FL

132 Beds Skilled Nursing and short term rehab

69 Independent Living Apartments

34 Assisted Living apartments
Florida Cooling Rule
Hurricane Irma

Strongest Atlantic storm in over a decade

Made landfall in Florida on September 10, 2017

Port of Miami closed for three days
Hurricane Irma, By the Numbers

7.7M customers lost electricity (73%) with a peak of 6.7M
4.4M without power 48 hours after landfall
6.5 Million Floridians under direction to evacuate
Estimated $53B of damage across the state of Florida
84 fatalities, state-wide

Healthcare
350 NH lost power. 88 had to evacuate (700 facilities)
1677 ALF lost power. 635 had to evacuate (3100 facilities)
50% did not recover power within 2 days
Tragedy in Hollywood Hills, FL

The Rehabilitation Center at Hollywood Hills

152 Bed Privately-Owned Nursing Home

Power outage for more than 3 days

Facility air conditioning was not connected to emergency generator

12 heat related deaths attributed to the hurricane
Florida Emergency Power Rule

September 16, 2017 Governor Scott issued an emergency order for generators. This applies to every nursing home and ALF in the state. This was ratified by the state legislature in March of 2018. It calls for:

- File an Emergency Power Plan (EPP) with local EM authorities and AHCA
- Identify a cooling space for all patients/residences (20 ft² for ALF, 30 for SNF)
- Maintain 81°F for 96 hours in the event of a loss of normal power
- Target enforcement date of June 1, 2018
- Installed and operational by January 1, 2019
States that have rules or are considering rules in their legislature
JLRD – Jason Carpentier
General Design Considerations

• Owner/Code Requirements
• Begin Creative Evaluation Process of Options
• Existing Essential Electrical System Config.
• Existing Fuel Supply Runtime vs. New Fuel Storage
• Existing HVAC Load Config. (CHW/CT/SWUDs/DX/VRF/HP).
• HVAC Control Appurtenances (BMS/EMS).
General Design Considerations

- Number of Services and Voltage/Phase Config.
- Grounding Config. of Services and Systems
- Demand Load History (Utility &/or Panels)
- Automatic Vs. Manual Transfer
- Location of Interfaces
- Paralleling vs. Single Gensets
- Equip. Space/Real Estate Allocation Required.
General Design Considerations (Cont.)

- Fault Current and Selective Coord. Study
- Surge Protection (Power and Controls)
- Impact Protection & Sound Mitigation
- Lightning Protection
- Phasing
- Budget vs. Cost
- Owner/Code Requirements
Existing McKeen Towers System

- Two incoming utility services from serving utility pad mounted transformers.
  - One @ 2000A; 277/480V; 3-phase; 4-wire; Wye
  - One @ 3000A; 277/480V; 3-phase; 4-wire; Wye

- 600kW diesel currently on site for essential electrical systems and life safety.

- 4000gal underground diesel fuel storage tank.
Existing McKeen Towers System
Load/Sizing Considerations

Options:

- Lifeboat – minimum load, powering AC for code-required space (20 ft\(^2\) per resident for ALF, 30 ft\(^2\) for SNF)
- Building cooling load only
- Whole House gen including essential systems

After review and discussion with the owner, the life boat and cooling-only solutions were not desirable to the facility management. A whole-house solution was the design directive
Challenges - Technical

- Space (underground garage, future construction)
- Existing underground utilities
- Interface to existing electrical systems
- Fuel storage on site vs. natural gas availability for bi-fuel option.
- Proximity of the generator to the property line.
Challenges – Facility Operations

• Excavation and site prep

• Parking and loading dock access

• Scheduling outages and power transition vs. 24/7 operation

• Inspections: Local AHJ and AHCA

• Testing/Startup/Commissioning
Generator Sizing and Solutions

Utility data shows an annual maximum peak of 1124kWD. Solution determined to be 1500kW with 200mph wind-rated enclosures

- Single 1500kW generator
  520” in length across five parking spaces
  52,000 lbs., no fuel. 73,000 lbs. with fuel

- 3x500kW generator solution
  408” in length across 3 parking spaces
  45,000 lbs., no fuel. 66,000 lbs. with fuel
Generator Sizing and Solutions
On Site Fuel – Bifuel Generators

Solution: 1500kW - 3x500kW bifuel generators. Simultaneous burn of diesel and NG
Based on historical loading, system designed for maximum of 72% loading
Generator rule calls for 96 hours of cooling support based on demand loading

Diesel only mode – 23.7 gph per gen @75%
Bifuel mode – 14.5 gph per gen @75%

3-1000 gallons day tanks tied to 4000 gallon UST
In bifuel mode this provides 161 hours of run time
On Site Fuel – Bifuel Generators
Existing McKeen Towers System
New Generator System
• 3x500kW Generac Bifuel Generators
• 3000A Gen Board
• 3x1000 Gal Tanks

ILF
• 3000A ATS
• Emergency ATS

SNF
• 1000A ATS
• Essential Systems ATSs
New Site Layout
Delicate Work – Utility Super Highway
Lourdes Noreen McKeen – Darrell Sanford
Located on Site of the Historic Pennsylvania Hotel
Mystery Steps to Nowhere
Questions for Lourdes Noreen McKeen

• What were the previous efforts to look at standby generation?
• How did Irma effect your facility and the residents? Any significant damage?
• How much of an impact did the Governor’s rule have on you versus acting on your own? Would you have done this anyway?
• What made you choose a turnkey solution as opposed to design-bid-build?
• What about the bifuel system made you go in that direction?
• As the project moves forward, how well has it been received?
What were the previous efforts to look at standby generation?

• An existing generator on property for 20 years.
• This is a standard diesel generator that powers up only key emergency systems
• This generator would only run limited key systems in throughout all three entities at our community (IL, ALF, SNF).
• It would power up key strategic red plugs, elevators, dining, limited lighting, and life safety systems
• It would not run AC systems or other systems
• There were limited red plugs in our ALF and very limited red plugs in IL
How did Irma effect your facility and the residents? Any significant damage?
Our community is a hurricane resistant structure. Post tension structure (Cat 5 Hurricane)
Post Hurricane Andrew building code improvements
Dedicated plant operations department
No evacuations of residences in 20 years
No significant structural damage during Irma
Utility was delayed in returning all three legs of power
This meant that post Irma we had only a 1/3 of our power restored and our existing generator attempted to compensate
The delay in returning full power was one of many factors in how we viewed complying with the governor’s mandate
Lourdes Noreen McKeen

How much of an impact did the Governor’s rule have on you versus acting on your own? Would you have done this anyway?

Prior to the storm, investigated improving aged generator plant
In process of multiyear renovation plan - reevaluating many existing systems
Pre-Irma new emergency generator plant system was budgeted
Consistent with drive to offer a superior level of care to our residents & guests
Governor’s rule moved the upgrade from “wish list” to mandated
  Accelerated the internal approval and the sense of urgency
  Timeline forced a review of plans to find a unique, collaborative solution
What made you choose a turnkey solution as opposed to design-bid-build?
Many factors that pushed us to pursue a turnkey solution
  Not waiting out the debate of the mandate
  Drive to be first to comply the governors order
  Desire to be THE safest place an elderly person could be during a hurricane
  Collaborative effort met the needs of short, intermediate, and long term plans
  Design and bid firms were interested only selling us their solutions.

“We want to turn the generator system into not just a part of the plant operation makeup of the facility but a marketable piece of the community. As these power regulations develop people want to know that communities will not just keep the air on or meet the bare minimum standard required by the state but, will go above and beyond for the care of their loved ones.”
Lourdes Noreen McKeen

What about the bifuel system made you go in that direction?
Pre-Irma goal was a new generator plant for the entire building
To meet that need we would have to have substantial fuel storage
The governor’s order guidelines made it difficult for us to meet our goal
The bifuel system helps not only meets but exceeds the governor’s mandate
Future needs would be restricted if we went with straight diesel generator
Hardened natural gas line made an ideal candidate for the bifuel system
Additional protection through fuel redundancy
It helps us meet our building plans for the future at our property
This system enables us to better serve, market, and operate our facility
External Factors – Project Delay

From mid-March until mid-May West Palm will see hundreds of thousands of visitors for these events.
As the project moves forward, how well has it been received?
The project has been received overwhelmingly positive by our residents, guests, prospective residents, and the state of Florida’s regulatory bodies involved in this process.
It helps to differentiate ourselves from other providers who have just met the bare minimum of power requirements.
Going forward there will be greater focus from the public on these systems and will see the need to provide a marketable approach to encourage corporate leadership to buy into investments beyond the standard.
Facilities must look at these systems not as a merely regulatory headache but as a chance to prevent future issues during an emergency situation.
Communities will be held to a higher standard and when there is another Hollywood-like incident that will push forward additional regulatory requirements.
Evaluation

Your feedback is important to us when planning future conferences. Let us know what you think!

How-to submit a session evaluation:

• Open the PDC Summit mobile app.
• Fill out and submit the evaluation form.