

**FAQs - Tour Team
SRJ – March 22, 2012**

1. Is SRJ a “microgrid” or a “smart grid”? How do you define the difference between these two things? (or is there a difference)

There is no one agreed-upon definition for either term. The term “microgrid” usually refers to an electrical system that is smaller and can operate independently from the much larger utility grid. For example, PG&E microgrids must have their own source of generation that is independent from the utility grid. Historically that generation source has been diesel generators.

Military bases, hospitals and business campuses often have microgrids in place. Santa Rita Jail is a microgrid as it operates independently from the utility and manages its own electrical generation and demands. It applies the CERTS approach for the control and operation of the generation sources; thus it is a CERTS microgrid electrical system.

“Smart grid” describes a more flexible system that can better respond to changes in electrical demand and allow energy and information to flow from and to end users. This is done by inserting information technology and computing elements at different levels of the system such as smart meters, advanced controls, smart transformers, load forecasting, diagnostics, etc. The Santa Rita Jail microgrid has attributes of a smart grid including the distributed energy resources management system (DERMS), metering and the ability to respond to loads at the jail.

SRJ can be defined as both a microgrid and a smart grid, or a smart microgrid.

2. Is SRJ the largest microgrid in the country? Or just the largest CERT-certified microgrid in the country?

The SRJ is the largest CERTS based microgrid, not the largest microgrid. In fact, it's the only CERTS microgrid implemented on a commercial facility. Other CERTS microgrids have been implemented in lab environments.

3. Are there other microgrid jail projects? Is this the only one in California? The country? The world?

Yes. There are other microgrid jail projects in California, but the SRJ project is the only one that has large scale battery storage, and the only one that has this level of renewable generation, making the project unique.

4. What is CERTS? Why is it important?

CERTS is the Consortium for Electric Reliability Technology Solutions. The CERTS vision is to transform the electricity grid into an intelligent network that can:

- Sense and respond automatically to changing flows of power and emerging problems
- Enhance reliability
- Empower customers to manage energy use in real-time
- Seamlessly integrate distributed technologies to support the needs of both the grid and individual customers

This is the country's largest CERTS-based (consortium for electric reliability technology solutions) microgrid with renewable and large-scale energy.

Why is it important?

- A key feature of a microgrid, is its ability, during a utility grid disturbance, to separate and isolate itself from the utility seamlessly with little or no disruption to the loads within the microgrid. Then, when the utility grid returns to normal, the microgrid automatically resynchronizes and reconnects itself to the grid, in an equally seamless fashion.
- A critical feature of the CERTS Microgrid is its presentation to the surrounding distribution grid as a single self-controlled entity. A CERTS Microgrid appears to the grid as indistinguishable from other customer sites that do not include distributed energy resources. The microgrid avoids many of the current concerns associated with integrating distributed energy resources, such as how many distributed energy resources the system can tolerate before their collective electrical impact begins to create problems like excessive current flows into faults and voltage fluctuations.
- The CERTS Microgrid concept seeks to provide this technically challenging functionality without extensive custom engineering. In addition, the design of the CERTS Microgrid also provides high system reliability and great flexibility in the placement of distributed generation within the microgrid.

- It is designed to continue operating with loss of an individual component or generator. It can insure even higher levels of reliability.
 - The plug-and-play concept means that a distributed energy resources unit can be placed at any point within the microgrid without re-engineering its controls. The plug-and-play functionality is similar to the flexibility one has with home appliances. That is, just as an appliance can be plugged in wherever there is an outlet, one can similarly locate distributed energy resources units at any location within a facility or building where they might be most needed. This is in sharp contrast to the traditional model, which clusters distributed generation at a single point in order to make the electrical integration tasks simpler.
5. **Is Santa Rita Jail a zero-net-energy site?**
No, but the microgrid is allowing the jail to purchase power at off-peak times. The communications technology with the Advance Energy Storage unit allows excess power to be stored.
6. **What were the technological challenges to making this project work?**
We learned that:
- the CERTS Protocol is a powerful tool for integrating distributed generation resources
 - Utilities are more comfortable with static disconnect switches if used with conventional equipment
 - Capable power quality and energy monitoring system is essential
 - Battery-PCS integration should be carefully managed
7. **Will this technology help lower greenhouse gas emissions? Are there immediate environmental benefits? Are there environmental benefits to a smarter grid?**
Yes. Part of the jail's power is being produced by wind, solar and a fuel cell. The battery allows the jail to store excess energy from these renewable components.
8. **There are several renewable projects on this site. Is there a model relationship between renewable energy and smart grid projects? Is this how project like this will function in the future?**
Yes, the renewable energy—wind, solar are key elements of this microgrid. A unique element of the system is its ability for plug and play. The jail can add clean renewable power to the Smart Grid. If the county chooses to add more solar or wind to power the facility, the system will integrate that new power supply without any impact on the state's power grid. They have the infrastructure to add more batteries, add more solar. It is scalable.
9. **Will this project save California from some of the energy and “blackout” issues the state faced in 2001?**
This project will save the jail from the issues California faced in 2001. It's a model for other facilities in California who have faced similar challenges.
10. **How do we define the size? Is it the amount of generation? The amount of storage? The amount of customer load? Etc.?**
We define the system size by voltage class (12 KV), customer demand (2.0-2.5 MW), available on-site resources such the PV, Fuel Cell and the Storage and maybe the annual electrical consumption at the jail.
11. **What are the key technological features of the microgrid? What allows it to work?**
Some of the key elements include:
- The static disconnect switch technology – where utility power enters the facility at the point of common coupling
 - The Distributed Energy Resources Management System (DERMS) – this is what makes the Smart Grid smart --integrating the distributed technologies, including generation, storage, controls and communications
 - The Advanced Energy Storage Unit, the battery
12. **Are there any technological elements – perhaps the battery or IT system – that stand out that make this project possible?**
Yes. The Distributed Energy Resources Management System (DERMS) – this is what makes the Smart Grid smart --integrating the distributed technologies, including generation, storage, controls and communications. The Advanced Energy Storage Unit allows excess power to be stored.