

2009 Skagit County Data Centers Facility Action Plan

- 6-18-09 Resource Conservation Audit of Skagit County's Two Data Centers
Audit led by Chao Chen of PSE, accompanied by Mike Almvig, Skagit County IS Director and Ric Boge, SCOG RCM.
- 8-18-09 Final audit summary and 2009 Facility Action Plan for Skagit County Data Centers as described below.

1. Skagit County Data Center at 2911 'B' East College Way

This high-security, state-of-the-art data center was opened mid-2008. Funding was available at the time to construct the Center with extra capacity to accommodate future growth. Currently it houses 8 servers occupying about ½ of a server bank row. It has capacity for three rows of server banks. The server room has three rows of floor tiles, about 8 tiles in length and 2 tiles in width, with several holes in the tiles directly in front of the server bank rows to supply cooled air from below. Warm air is vented out through three ceiling locations on the backside of the server banks. No 2008 EUI has been established for 2008 due to this facility opening mid-year.

This facility's electricity account # is 427004579 and meter # is Z007673014. The meter is sending data to the Energy Interval Service website. (See attached Utility Manager and EIS reports.)

Basic description:

- A. Comprised of an estimated:
- 80 sq ft reception room
 - 120 sq ft utility/fire suppression system room
 - 1200 sq ft server room, and
 - 200 sq ft electrical room.
- B. HVAC system consists of:
- One small electrical heater in the utility closet (to keep pipes from freezing in the winter)
 - One 40 ton electric AC unit servicing the server room
 - One 10 ton electric AC unit servicing the electrical room
 - Set points: 68-70 degrees F.
- C. Electrical room consists of:
- Electrical panels
 - Four Uninterrupted Power Supply Units (2-pairs for redundancy), each 'trickle' charging a set of batteries for emergency power, if needed.
 - Two generators, one for each pair of UPS units
 - Computer with building control system software installed.

Conservation and Energy Saving Recommendations:

- 1) Only one of the two UPS units is needed to provide emergency power to the limited number of servers currently housed at this facility. More power is currently being used to charge the backup batteries for both units than needed to power the limited numbers of servers. The County could save approximately 87,000 kWh/year (\$5500) by shutting down one of the redundant UPS pairs on the A and B sides for extended periods of time until additional servers require the additional emergency power backup. Consult with equipment manufacturer and/or installer to implement this measure and consider cycling the UPS systems if shut down is not an option.
- 2) Move the temperature control for the Data Center AC to just above of the front of the Server Rack. Set Air Conditioning to turn on at 75-77 degrees to maximize use of outside air for cooling with economizers much of the year.

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- 3) Replace air-passing floor tiles in areas of the Data Center that are currently unused with non-air passing tiles. This will provide more pressure and cooling at the servers that are in service.
- 4) Check to see if there are variable fans in AC units and exhaust vents. Make use of the variable speed feature, if available.
- 5) Look at procuring the ACR Smart Reader power monitor to closely monitor various power usages at the facility to better understand the power consumption-breakdown at the facility.
- 6) Continue to occupy the facility as little as possible with all lights turned off when leaving.
- 7) Consider opening the door to the electrical room during colder months for the conditioned air from that room to help heat the server room.

2. Skagit County Data Center in Downtown Mount Vernon

This data center was not originally designed for data center operations. The space evolved over time, beginning in the 1990s, as needed to best accommodate subsequent growth in Skagit County IS services. Consequently, cooling sources are limited and buildup of heat in the room is of much concern. (Server batteries are prone to early failure in this room.)

As servers at this facility are due for replacement, new ones are purchased and installed at the College Way Data Center and the old ones here are de-commissioned. However, this facility will continue to provide redundancy to the College Way Data Center until another, better location for redundancy is located. Also, this facility will continue to act as an 'internet node' and pass through for associated fiber optic cables.

This facility is served by, but not specifically metered for, PSE electricity and CNG natural gas. It is a component of the metering of the County Courthouse and Administration building complex in downtown Mount Vernon so a specific 2008 EUI just for the downtown data center is not possible.

Basic description:

- A. Comprised of an estimated:
 - 800 sq ft of space
 - Two rows of server banks about 12 feet long
 - Two 'stand-alone' server banks
 - Miscellaneous computer equipment and supplies.
- B. HVAC service consists of:
 - Two small AC units mounted in the room
 - Outside air vented directly into the room
 - Fan mounted in front of one of the outside air vents to increase velocity of outside air coming into the room

Conservation and Energy Saving Recommendations:

Given this facility was not designed for operation as a data center it will largely remain inefficient from a power use view point. Best plan is to reduce its operation to as low as possible and:

- 1) Transfer servers from this facility to the newer one as soon as possible.
- 2) Bring in more outside air to economize once servers are out of the room.
- 3) Look into putting redundant Virtual server needs in another data center facility.
- 4) Continue to occupy the facility as little as possible and be sure lights are turned off when leaving.