

Update on the Nuclear Power Plant for Green River



Drill rig operators collect soil samples.



The Green River plant will be similar to this one being constructed in China.



Water was monitored at the Green River site which is part of the requirements for licensure.

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Editor

Where in the process is the Blue Castle Project? This project is for a two unit nuclear power generating unit near Green River. The company, Blue Castle Holdings recently held a webinar to give an update on the project.

Those participating included utilities, media, financial institutions as well as power buyers. Aaron Tilton is the CEO; Tom Retson, chief operating officer and Nils Diaz-chief strategic officer all participated in the meeting.

Tilton said Westinghouse has been involved, but he wasn't authorized to speak of their involvement.

"In power generation the mix is changing over time due to demand and the environment. How utilities acquire new resources is changing. How does nuclear power fit in?"

Tilton said nuclear power is super dependable. Blue Castle will reduce time and risk for the utilities in acquiring new resources.

On Aug. 20, 2014, Blue Castle signed a Memorandum of Understanding with Westinghouse for a two unit AP1000 nuclear power plant.

Utah established state tax incentives for new nuclear plants which will save an estimated 1.3 billion. The construction material will be tax exempt which is a significant tax incentive for new nuclear. The water was approved by the Utah Division of Water Rights and Emery County and Utah government have been very supportive of the project. SITLA has also been a development partner. The Utah State Legislature passed a resolution supporting investment in new nuclear power. At the commencement of operation of the new nuclear plants there will be a 75 percent tax credit of all new taxes paid to the state of Utah for 20 years.

In the western United States there are only three nuclear power plants.

Tilton said another base load is required as the west is a fast growing region and several coal fired plants have closed. With the EPA and regional haze requirements, that rule could cause the closure of 50 percent of the coal fired plants, between 2015 and 2040.

Several coal fired plants are reaching the end of their design life. All coal fired retiring capacity cannot be prudently replaced with natural gas units and/or intermittent renewables alone. There is too much concentrated risk into too few resource types with significant price and production volatility drives up electric prices.

Replacement generation for closures must be a balanced mix to reduce risks to utilities. It's a risk to replace all coal fired plants with natural gas. Natural gas prices are low at this time, but natural gas has a history of volatility which continues today and into the future.

Pricing for nuclear power include lower costs and stable prices.

Tilton said a resource mix adds stability to a region. In 2015, the resource mix was 19 percent nuclear; 40 percent coal and 35 percent natural gas; by 2021, the mix will be 55 percent non-emitting resources; 20 percent coal and 18.6 percent natural gas.

Georgia is adding a two unit nuclear power plant. These units are 60 percent complete at this time.

Nuclear power is the largest source of clean power. Nuclear isn't the total answer, but part of the mix. Blue Castle in one square mile can generate more power than 140 square miles of solar or 1,000 square miles of wind. The nuclear footprint is small compared to these other sources of power.

California wants to use only renewables by the year 2020. Tilton emphasized that renewables are intermittent, you still need a base load generator. Renewables are hard to use and integrate into the system.

"Baseload nuclear always fits in the resource mix. It doesn't have the complications of renewables," said Tilton.

Tom Retson has been working on the Green River site preparation. He has been involved in the data collection at the site. He believes the Green River site is very favorable to nuclear power. The water has been secured. The town of Green River is nearby only four miles to the west. There is rail access, and interstate running east/west and there are existing utility lines as well as transmission corridors running both east/west and north/south.

The data collection and the meteorology study were needed for the nuclear permitting with the nuclear regulatory commission. Retson said the borings went down 600 feet on the geology study and 10 bore holes were drilled. Borehole optical and acoustic televiewer surveys were completed. Two years of meteorology data were collected on wind speed, wind direction, temperature, relative humidity and precipitation.

The results were a consistent subsurface for the plant. The seismology tests modeled how the site would do with an earthquake occurrence anywhere within 500 miles. The Nuclear Regulatory Commission has visited the site. They sent a letter to Blue Castle where they evaluated the pre-application subsurface investigative activities. In the letter they stated the geotechnical activities were adequately controlled with an appropriate level of quality assurance and no issues were identified.

The hydrology data came from test wells on the plant site as well as analysis of the Green River. Socio-economic data is also needed for the application. The socio/economic data included: a demographic study within a 50 mile region of the site of the plants. Information gathered included; available labor supply, transportation facilities, taxes and political structure, schools, hospitals and doctors, police resources, fire fighting resources, potable water and waste water, historical and actual characteristics; population data from a six county area.

In the hydrology study 18 wells were installed in depths from 30-150 feet. Surface water and ground water was tested. All data is being evaluated.

The site has been visited by NRC officials and they expressed their solid support of the project.

Retson referred to the used fuel and after 60 years of nuclear power producing the spent rods will fit on a 1.5 acre site on the nuclear power plant property. On site storage will help keep costs down.

Nils Diaz has been actively involved in the technology, licensing and construction side of the venture. The decision was made to go with tried and true technology to speed up the construction process. Eight reactors of this type are being constructed in China and in the United States; this is the AP1000 model. It is a new generation of reactors without the demands of the old reactors. The new reactors offer minimum licensing risk. The license is approved for construction to begin anytime within 40 years. Sixty-five new nuclear plants are under construction worldwide.

Once the license is obtained the project is bankable. If all the right things are done the NRC is legally bound to grant the license. The application period will take three years. The AP1000 is an established design. The safety of the design has been established.

Diaz said they didn't choose the small module reactor, it looks good, but it has no basis and there aren't any of those currently licensed or under construction.

Dr. Diaz spent 10 years working for the NRC on licensing and regulatory on anything nuclear, he traveled all over the United States in this capacity.

Dr. Diaz is currently working on the licensing for the Green River site and believes the AP1000 represents the largest amount of risk reduction in a reactor. The Green River project is large. It will take five-seven years to build. Tilton described the typical cycle they are currently involved in: first they secured the land which takes three-five years; two years for utility construction; two-three years to secure technical vendors and contractor selection; two to three years for licensing and five-seven years for the construction.

To reduce risks and to hopefully speed the process along, Blue Castle has visited several projects under construction currently. They have monitor reports from other projects. Extensive review of other projects showed where adjustments could be made to reduce the years the Blue Castle Project will take have been scrutinized. Some of the projects are on time and on budget and others are not. Blue Castle intends to review the good and the bad and see what Blue Castle can do to change outcomes.

One item they have picked up is utilities tend to give notice to proceed on construction before the project has been adequately engineered. Blue Castle has changed its model and will take the experiences of those who have come before and learn from it.

Some of the companies others chose were not ready for regulatory compliance. Blue Castle hopes to avoid this. Blue Castle realized early in the process that selecting a contractor first will be beneficial. Then the construction company can become involved early in the process so they can be aware early of what is required of them.

Blue Castle has invested the first \$20 million of the project into the feasibility studies and to align with contractors. They will interview construction contractors and will remove risks. Partnering with construction partners first will help reduce risks. They are also working with Westinghouse.

Blue Castle hopes to phase down the typical process with their expedited time line: currently they have nine years into the land and water procurement; next phase is three-five years in licensing and then five-seven years construction phase.

Using proven technology will also help move the process along. Another aspect of the project is financing; There are institutions out there who buy bonds for these types of projects and will supply capital for long term investment and returns. Tilton mentioned Bank of America and Merrill Lynch who have helped with projects in Georgia and South Carolina. These 60 year asset life bonds are very stable investments.

Tilton said, "There's a robust market for investment in nuclear." Investors in this project could recover their capital in the first 20 years of the plant's operation. Some utilities may purchase more power than they themselves can use and will sell the excess power to others." Tilton said they are getting a base figure for capital costs from the units being built in Georgia. Estimates for the cost of the project is 13.4 billion. Projections are the plant will be inservice in 2028 with the first unit and 2030 with the second unit. Limited new nuclear capacity in the western United States creates long term low cost power.

Utilities were instructed how they could get involved with Blue Castle on the project. Blue Castle has assumed the first 15 years of risk in the project. Utilities are encouraged to look at investment, although no financial commitment will be required over the next three years. Tilton said he believes some utilities will want to secure their positions with a financial commitment now. There are three-four times more demand for the power the plants will produce than the capacity of the plants.

Blue Castle Holdings is moving forward with licensing, and developing a building consortium. The licensing process will last from 2017-2020. Construction phase will begin 2023-2030. In the fourth year the financial commitments begin.

Tilton answered a few question which were submitted online. The transmission lines in the vicinity of the nuclear power plant are owned by PacifiCorp. Is Pres. elect Trump in favor of nuclear? Tilton said nuclear power enjoys a unique spot because it has political support from both sides of the aisle. All but three nuclear plants in the United States are on the east coast.

What will the economic impact be with the addition of nuclear power in Utah? The plants will bring in .5 billion annually in revenue and taxes paid both to the state and locally.

During the construction phase which will last seven years, up to 4,000 people could be employed. These employees are expected to come from throughout the United States. After construction phase the operation phase could employ from 800-1,000 people in long term good jobs.

Tilton said Utah's workforce is very prepared for a project of this magnitude. Utah has produced electricity for a long time and employees are qualified. Coal fired generation and nuclear generation have a lot in common. Electricians and engineers are needed for 75 percent of the operation and those specifically trained for nuclear would make up the other 25 percent of the workforce.

Tilton was asked if the Green River site would be able to hold another power plant. Tilton said yes the site is large enough for a third unit, but economically two units are good.

The question was asked if the nuclear power plant will export power.

Tilton said they anticipate most of the power produced will stay in the state of Utah.