

Forum Report – Janet Spriggs

On **Thursday, May 12** around the noon hour, Robin and I met in our hotel parking lot so we could carpool to where the tour would begin for the Hanford's historic B Reactor. I can honestly take the blame for us almost missing the tour bus as my Google Map app on my phone sent us pretty much the longest route to the site – they were almost fully loaded on the bus when we finally got parked! The bus ride probably took about an hour, with all of us ladies from various chapters, probably 30 in total, all talked up a storm with each other. We had a tour guide, a man whom I don't remember his name, but he was incredibly friendly and helpful in answering questions. They also played a few information videos on overhead t.v. screens (similar to what you see on airlines). With all the gabbing going on, it was hard to hear all of what was being said on the videos, but what I did catch was informative and interesting.

We reached the site and were informed that a second group would also be attending a special tour of the facility at the same time – I found out later from my cousin who works on the Hanford site, that these tours are few and far between, so we were pretty blessed to have been given the opportunity to visit the site. We all walked in and were seated in a big room, which essentially was the location of the “Front Face” of the B reactor! It was impressive to see and I wish I had taken my camera, but I assumed we wouldn't be allowed to actually take pictures! While seated in this room, we learned of the history of the site and the physical generation of plutonium by using Uranium and the necessary chemical reactions. In summary, the B reactor development broke ground in October of 1943. By September of 1944, the B reactor was operating, with B reactor plutonium delivered for the first time to Los Alamos, New Mexico 5 months later, followed by the infamous Fat Man Bomb being dropped on Nagasaki, Japan in August of the same year. In essence, Uranium was mined and used as the fuel source for the nuclear reaction taking place within the process tubes, which were loaded into the Front Face of the Reactor. The fuel remained within the reactor block while it was “irradiated” by nuclear reaction. Water, pumped directly from the Columbia River, was supplied to the process tubes at a rate of initially 35,000 gallons per minute, and later raised to 70,000 gallons per minute, in order to cool the tubes. Irradiated fuel was discharged from the rear face of the reactor and stored in a water-filled basin. Fuel, which ultimately amounted to a total mass of 64 metric tons, was transported in shielded casks to chemical processing plants where the plutonium was separated.

The B Reactor was ultimately shutdown in February of 1968, with a declaration of the site being considered a National Historic Landmark by the US Dept. of the Interior in August, 2008. The residual effects of the nuclear fuel generation process, which included 53 million gallons of radioactive and chemical wastes now stored in 177 underground tanks on the site, has ultimately led to a massive environmental assessment and clean-up operation of the Hanford site. This operation, deemed the “Waste Treatment and Immobilization Plant” (or Vitrification – VIT plant), was begun in September, 2001, with a budget of \$12.2 million. The total plant development will encompass an area of 65 acres with four new nuclear facilities (Pre-Treatment, Low-Activity Waste Vitrification, High-Level Waste Vitrification, and an Analytical Laboratory), as well as operations and maintenance buildings, utility infrastructure and office space. The VIT plant is essentially being designed and constructed simultaneously, which is

due to the fact that this type of development has never been done before. Design is set to be complete in 2013 with construction complete in 2016, followed 3 years later by the actual operation of the facility. In essence, the waste stored underground will be pumped to the Pre-Treatment plant where Low-activity (liquid portion of the waste in the tanks) and high-level radioactive waste (primarily the solid waste in the tank) will be separated out. The low-activity waste is essentially “cooked” with a silica and other glass-forming material, with the molten mixture poured into large stainless steel containers, which will be stored at the Hanford site in permitted trenches covered with soil. The high-level waste are also mixed with glass-forming materials and “vitrified”, where it too is poured into stainless steel canisters. The difference here is that these canisters will temporarily be stored at Hanford, but eventually will be shipped to a federal geological repository deep underground for permanent disposal. Both process essentially take the waste from a solid to a “glass-like” form, which is considered to be “stable” and “impervious” to the environment, with its radioactivity dissipating over hundreds of thousands of years.

On **Friday, May 13**, our group was given the opportunity to travel to the Nine Canyon Wind Farm, operated by Energy Northwest. We traveled in a multi-car caravan to the site, which was probably 40 minutes from our hotel. The Energy Northwest folks essentially did a presentation to our group right there within their operations building and we then were able to walk as a group to one of the mammoth wind towers. These massive assemblies, which typically consist of a 12-foot diameter base structure and 210-260 foot tall structure, are amazingly quiet! I don't have all the “data” they shared, as they didn't pass out much material, but I do remember that the parts and pieces require up to 6 different semi trucks for delivery to the site. The parts are currently being manufactured overseas and reach the Nine Canyon site via barge up the Columbia River. It was mentioned that the motors for the turbines are being manufactured in the United States.

I hope this is informative!

Janet L. Spriggs, P.E., LEED® AP

Associate Principal/Civil Department Manager

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100 West 13th Avenue, Eugene, Oregon 97401 (541) 686-8478 fax (541) 345-5303