Brazil in the Third Millennium
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On our trip to Brazil we visited the Angra Dos Reis nuclear power complex. This is the only source of nuclear power in the entire country. This plant is providing about four percent of the country's power. The plant is located between Rio de Janeiro and Sao Paulo.

The history of nuclear power in Brazil follows a very rocky road. Brazil has one nuclear power complex named Angra. "It is located at the Central Nuclear Almirante Álvaro Alberto (CNAAA) on the Praia de Itaorna in Angra dos Reis, Rio de Janeiro, Brazil. It consists of two Pressurized water reactors, Angra I, with a net output of 626 MWe, first Angra I was purchased from Westinghouse Corporation, and the purchase did not include the transfer of sensitive reactor technology. As a result, Angra II was built with German technology, as part of a comprehensive nuclear agreement between Brazil and West Germany signed by President Ernesto Geisel in 1975. The complex was designed to have three PWR units with a total output of circa 3000MWe, and was to be the first of 4 nuclear plants that would be built up to 1990. connected to the power grid in 1982 and Angra II, with a net output of 1275 MWe, connected in 2000"(Wikipedia). Angra I and Angra II are built with different technology which is part of the reason that Angra II is so much more powerful. "Angra I was purchased from Westinghouse Corporation, and the purchase did not include the transfer of sensitive reactor technology. As a result, Angra II was built with German technology, as part of a comprehensive nuclear agreement between Brazil and West Germany signed by President Ernesto Geisel in 1975. The complex was designed to have three PWR units with a total outpout of circa 3000MWe, and was to be the first of 4 nuclear plants that would be built up to 1990"(Wikipedia).

Throughout its existence Angra has been plagued by setbacks. From it very beginning there was a strong opposition to its creation. "Serious problems relating to the inefficiency of the German technology, corruption and administrative incompetence, and widespread public opposition to the construction of a nuclear plant in a mangrove national park between the two largest populational centers in Brazil stifled the project and

turned it into one of Brazil's biggest white elephants, consuming over 12 billion dollars in 30+ years of construction. The complex has also been routinely plagued by malfunctions, shutdowns and spillages, the last of which occured in 2001, when 150 liters of radioactive water spilled into the ocean after a rupture in one of the containment tanks. The equipment for Angra III, the last phase of the complex, was purchased in 1995 but has been in storage ever since, consuming 50 million dollars a year in maintenance costs"(Wikipedia). Even with all the negative aspects of the plants, they do provide 3000 jobs at the plants and indirectly help to create another 10000 jobs in the area. Without these plants thousands of people would be without jobs.During our time at the plant we learned about the operation of the plant and the some of the safety measures that are in place incase of a problem at the plant. One of the measures they use is a tiered evacuation system in the event of a radiation leak. The area around the plant is evacuated in sets of 15 mile circles. They are evacuated based on the severity of the leak. No such problem has ever occurred at the plant to this day. The picture below is an example of some of the devices used to monitor emissions at the plant.

The plant is currently providing 40% of the power for Rio De Janeiro. If the third plant is added to the complex it could help the current energy problem that is facing Brazil. While it has been a struggle to get the funding needed to complete the project it is looking like the appropriate funds will be available in the next few years. The plant should be able to be finished by around 2008.

References

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