EXELON’S CLINTON POWER STATION EXPANSION – DEWITT COUNTY, IL

ENVIRONMENTAL IMPACT STATEMENT CASE STUDY

Lead Agency: Nuclear Regulatory Commission (NRC)

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CRP- 5540
Environmental Impact Statement Case Study
Tuesday, November 9th, 2010
Environmental Impact Statement for an Early Site Permit (ESP) at Exelon’s Clinton Nuclear Power Station

Summary & Timeline

In September, 2003, the Exelon Generation Company, LLC submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for an early site permit (ESP) for a site titled “Exelon ESP.” This site is adjacent to the already existing Clinton Nuclear Power Station (CSP). The ESP is simply an approval of a location for siting of one or more nuclear power facilities, and is separate from a construction permit and operating license. Exelon was not seeking approval for construction or operation or a new reactor but simply beginning the process. Once issued, an ESP is “banked” for twenty years, meaning at any point during that time period Exelon could pick up the permitting process where they left off.

In its ESP application Exelon also requested approval to perform preparation activities to ready the site for construction. They were not required however, to assess the need for power in that application. In the fall of 2003, while the application for the ESP was being processed, NRC began to prepare an Environmental Impact Statement (EIS). In that report they were required by law to address site safety, environmental impacts and emergency planning. They held a public scoping meeting in December and did a site visit in March, 2004.

To conduct the EIS, NRC utilized internal staff researchers, Exelon’s Environmental Report that had been submitted in accordance with the ESP application, met with government agencies, followed review standards set forth by NEPA and consulted public comments received at the scoping hearing.

The draft EIS was released for public comments in February 2005. During the comment period a public hearing was held near CSP on April 19, 2005, where over 300 people were in attendance.

The NRC staff, with release of the final EIS in July of 2006, recommended to the Commission that the ESP be permitted and in their final evaluation of site safety they concluded there are no superior sites and the preparation construction should be allowed.

In a signing ceremony held in the NRC offices in Maryland, Exelon officially received its ESP on March 16, 2007. However, since gaining the ESP, Exelon has not moved forward with further permitting or construction and CSP still operates today with only one reactor.

Impacts & Mitigation

Within the EIS, the issues of environmental impacts and mitigation strategies for such impacts were broken down into two categories: those unavoidable during the construction process and those unavoidable during operation of the proposed reactor. A list of impacts and mitigation actions, separated by medium and the two aforementioned categories, can be found in Tables 1 and 2. (Not mentioned in the tables: CSP sits on a 14,300 acre existing site and the new reactor would have a footprint of 461 acres within it.)
## Table 1: Construction Impacts and Mitigation Strategies

<table>
<thead>
<tr>
<th>DURING SITE CONSTRUCTION</th>
<th>Impact</th>
<th>Mitigation</th>
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</table>
| **Land Use**             | • Removal of 3.5 acres of forested habitat: no endangered species, no old-growth trees.  
• Construction of new transmission lines: (as much as 25 acres cleared) short-term impacts to agricultural land. | • Impacts found to be “SMALL” no mitigation required.  
• Comply with local, state and federal permit requirements if necessary. |
| **Water**                | • Dewatering systems depress water table.  
• Loss of macroinvertebrates and shoreline habitat. | • Obtain Clean Water Act (CWA) Permits 401, 402 and 404 permits prior to site-preparation activities. |
| **Atmospheric and Meteorological** | • Air pollution: construction equipment emissions, fugitive dust, concrete production, vehicles used to transport workers and materials (300 additional truck trips on local State Routes). | • Comply with air quality regulations.  
• Implement a plan to reduce fugitive dust to the extent possible: wetting during dry periods, or paving construction roads. |
| **Radiological Exposure** | • Exposure of construction workers, from being in close proximity to the adjacent reactor would be well below the regulatory limits. | • Use of as low as reasonably achievable (ALARA) principles. |
| **Socioeconomic**        | • Increased use of services.  
• Traffic congestion (additional 1,650 cars and trucks added to each highway). | • Increased tax revenue would counter any negative effects. |
| **Environmental Justice** | • There are no “unusual resource dependencies by minority or low-income populations.” | • Off-site impacts to minority and low-income communities would be “SMALL” and warrant no mitigation. |

### Alternatives

**No Action Alternatives:** If the NRC denied the request for the ESP none of the environmental effects caused by the site-preparation construction or the assumed, eventual construction of the new reactor would be incurred. This would also result in none of the supposed benefits of the ESP (early resolutions of siting, financing and human resources issues).

**Energy Alternatives:** The first category under this section included those alternatives not requiring new generating capacity. Energy conservation, or demand-side management programs were deemed non-reasonable alternatives to nuclear power by the NRC in 2005. Purchased power, feasibly bought from Canada, Mexico or somewhere else in the U.S. would be generated from coal, natural gas or other nuclear. In this case, negative environmental impacts would be identical to those at the ESP site were it converted to natural gas or coal, and since the NRC cannot monitor additional sites or plants the precise impacts would be unknown. Lastly in this category is the option of extending the life of existing plants. Here, even though the environmental impacts of continuing operation of a plant are less than those of building a new one, it does not create more generating capacity. The second category of Energy Alternatives includes...
## Table 2: Operation Impact and Mitigation Strategies

<table>
<thead>
<tr>
<th>DURING SITE OPERATION</th>
<th>Impact</th>
<th>Mitigation</th>
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<tbody>
<tr>
<td>Land Use</td>
<td>• Potential increase in local housing construction</td>
<td>• Unable to predict future real estate development, impacts disbursed, no mitigation required</td>
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<td>• Crops, timber and other vegetation downwind of salt drifts from cooling towers</td>
<td>• Damage would be negligible, no action required</td>
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<td>Water</td>
<td>• Reduced water levels in Clinton Lake due to additional cooling tower</td>
<td>• No mitigation during years of normal rainfall</td>
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<td>• Reduction in available water released from the dam</td>
<td>• In times of reduced rainfall Exelon should coordinate with IL EPA-possible mitigation might include temporary shutdown of the unit</td>
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<tr>
<td>Atmospheric and Meteorological</td>
<td>• Heat and moisture (drifts) from cooling tower</td>
<td>• Residual salts and chemicals from cooling water would not substantially impact air quality-no mitigation required</td>
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<td>• CO₂ from generators, auxiliary power and workers' vehicles</td>
<td>• Infrequent use of CO₂ sources warrant no mitigation</td>
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<td>• CO₂ from the uranium fuel cycle of less than 0.8 million metric tons</td>
<td>• No mitigation required for uranium-related CO₂</td>
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<td>Radiological Exposure</td>
<td>• Citizen and workforce exposure via gaseous and liquid radiological effluent</td>
<td>• No observable health impacts (remains a “SMALL” risk to workers if legal limits of exposure are maintained)</td>
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<td>• Exposure of terrestrial and aquatic species</td>
<td>• Impact remains “SMALL” on non-human species is plant operates normally</td>
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<td>Socioeconomic</td>
<td>• Increased traffic (580 additional vehicle trips per day)</td>
<td>• The two-lane, lightly traveled highways can handle the traffic-no traffic mitigation necessary</td>
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<td>• 580 new jobs to operate the unit</td>
<td>• Economic benefits would range from “SMALL” to “LARGE” (in DeWitt County) and mitigation would not be warranted</td>
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<td>• Greatest economic benefit predicted within DeWitt county</td>
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<td></td>
<td>• Increase in tax revenue: income, sales, and most notable property</td>
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<tr>
<td>Environmental Justice</td>
<td>• No disproportionately high impacts could be found to affect the health and safety of minority and low-income populations.</td>
<td>• No action required</td>
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</table>
Environmental Impact Statement Summary

those that require new generating capacity. If a coal-fired power plant were instead placed on the ESP site it would have high levels of environmental impact (based on the NRC’s indicator scale), and like the nuclear station low risks to the health of workers and community members, and negligible impacts in the areas of cultural resources and environmental justice with large economic benefits for the region. Natural-gas, a second power-generating alternative scored better on environmental impacts, the same on health, and worse on socioeconomic.

Other Alternatives: In this section the alternatives of placing renewable energy power generators on the site were considered. These were wind, geothermal, hydropower, solar, wood waste, and municipal solid waste. All were found to be infeasible, due in large part to the existing landscape, infrastructure and resources in the region. They generally also had a smaller generating capacity, and sometimes created increased environmental impacts. These analyses were very brief. For most of the energy sources NRC had, in previous years and studies, concluded that they were not reasonable alternatives to an ESP for a base load nuclear power plant.

Site and Design Alternatives: There are various types of reactors and cooling systems that were discussed in this section. Since it was implied by Exelon’s ESP application that they would use a wet cooling system, dry systems or other alternatives were not analyzed. Additionally, since the specific type of cooling system was not explicit in the application, design alternatives could be addressed until the construction and then operating licenses were sought. As far as site alternatives, the EIS referred back to the Exelon’s (conducted before applying for the ESP). In their findings, compared to other locations in the region, the proposed ESP was the most environmentally preferable, especially compared to potential locations without existing nuclear such as greenfield or brownfield sites.

NRC Recommendations

In conclusion, the NRC found that none of the potential alternatives were superior to the ESP site. Broadly, they determined that any and all information lacking and additional research necessary could be addressed in the writing of EISs for the construction and licensing permits. Therefore, without hesitation the NRC granted Exelon the ESP. So on March 16, 2007, Exelon became the first company in the United States to receive an ESP from the NRC.

Clinton Today

As of 2010, Exelon has no current plans to continue with the construction process. Should they choose to do so, they have until 2027 to apply for the additional permits. It is important to note here, however, that they are indefinitely at a roadblock in Illinois due to a 23-year-old moratorium on building new nuclear in the state. They applied for the ESP in the hopes that by 2027 at the latest that ban would be overturned.

The state may be shifting in their favor. In March of 2010, the Illinois State Senate voted 40-1 to pass a bill that lifted that moratorium. But the legislation is still stalled in the House of Representatives. Therefore, so is Exelon.

Mark Kanavos: Plant Manager

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Clinton Power Station EIS
Sources

Riccio, Jim (November 8, 2010). Email correspondence. Nuclear Campaigner, Greenpeace USA

Clinton Power Station Region