4.3.3 Geothermal Power Generation Plant

Presentation Number: 003
Investigator: Lund, John (Oregon Institute of Technology)
Objectives: To drill a deep geothermal well and a geothermal power plant on the Oregon Institute of Technology campus.
Average Overall Score: 3.0/4.0

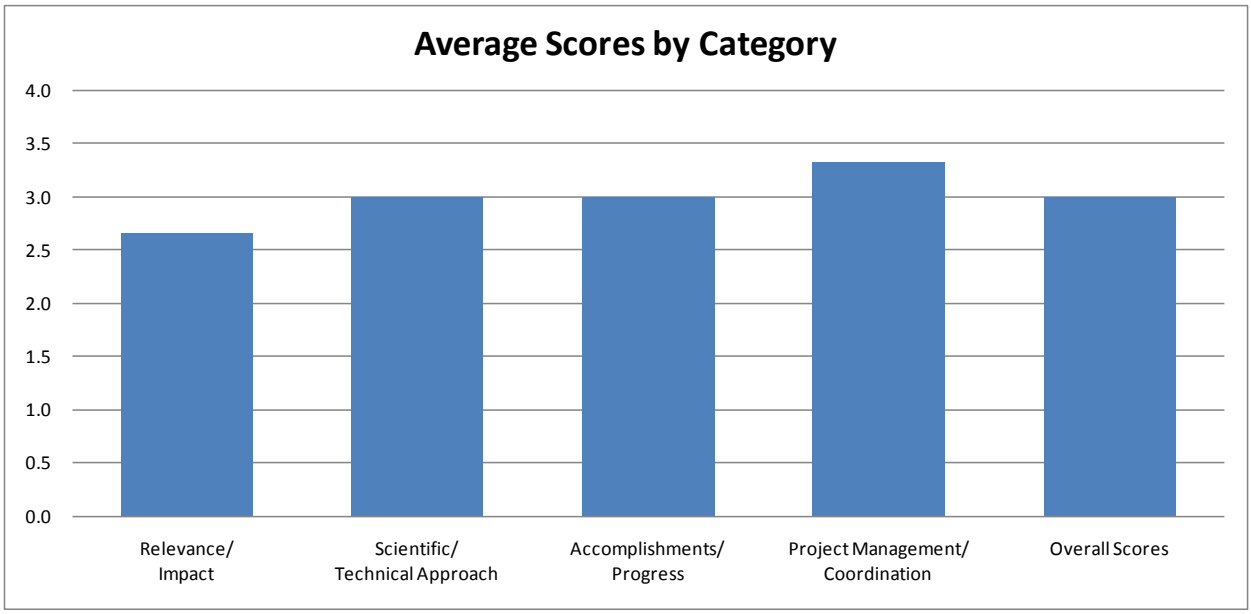

Figure 18: Geothermal Power Generation Plant

4.3.3.1 Relevance/Impact of the Research

Ratings of Three-member Peer Review Panel: Outstanding (4), Fair (2), Fair (2)

Supporting comments:

- This project will get power on-line. While the location of the OIT campus near geothermal resources makes it distinctive, this project will be a useful demonstration of geothermal potential for other governmental and educational facilities.

- Congressionally mandated project with good cost-sharing. This is a demonstration project that addresses barrier W, but is not germane to EGS. The PI made the point during his presentation that the electricity produced from this low-temperature GT project would not be cost-effective compared to grid supplied electricity, so perhaps an important part of the project would be a final report addressing what should be done by the GTP to make it cost-competitive -- or perhaps there is a lower limit below which the project size is too small for cost-competitiveness - obviously a function of context. The PI and the GTP should explicitly address this point.

- This project does not significantly advance EGS goals, but otherwise is a good project in a good location. The PI is quite honest about potential problems, and a few big ones still remain, including successful negotiations with Johnson Controls.

4.3.3.2 Scientific/Technical Approach

Ratings of Three-member Peer Review Panel: Outstanding (4), Fair (2), Good (3)

Supporting comments:

- This project will demonstrate the generation of power from lower-temperature resources. The design and execution of the technical approach will achieve the goals of the project.

- The project plan was reasonably well-developed. Not obvious the economics and field difficulties were completely addressed, although the PI is a seasoned GT professional. The use of subcontractor Optim was good to define the faults and to use directional drilling to intersect the fault. The assumptions made a priori may have been unjustified, i.e. an anticipation of 300 °F compared with the 190 °F actual.

- The technical approach has been well thought out and appears to be sound. The PI has extensive geothermal experience, a big plus for this project. The approach has been carried out well. However, it seems prudent to perform a tracer test at the earliest opportunity to help determine whether or not the new well is in communication with injection wells elsewhere on campus. If this were to be true, the project would have to be rethought.

4.3.3.3 Accomplishments, Expected Outcomes and Progress

Ratings of Three-member Peer Review Panel: Good (3), Good (3), Good (3)

Supporting comments:

- The project is providing a high value compared to costs, especially when considering intangible aspects such as educational opportunity for other potential geothermal end users. The team is high quality. A partner to build the power plant is still needed, but they are in negotiation with one vendor.

  The resource has a lower temperature than anticipated, which has led to some changes in the program. These changes are being handled well, and ironically may in the end provide greater value as a demonstration of how high-quality energy can be produced from relatively lower-quality resources.

- Reasonable project plan and coordination between numerous entities - challenging to say the least for a university environment. Plan should address potential short-circuiting of injectate and how this would be dealt with if it becomes a problem.

- The productivity has been fair, with some schedule delays. Several major hurdles remain. The team assembled for the project consists of some of the best and most experienced people in geothermal development.

4.3.3.4 Project Management/Coordination

Ratings of Three-member Peer Review Panel: Outstanding (4), Good (3), Good (3)

Supporting comments:

- The project has been well managed so far.

- Production well has been drilled and tested to 1,500 GPM flow. Water rights are being secured for 2,500 GPM, non-consumptive. Some concern on this reviewer's part of potential short circuiting and premature thermal drawdown. The potential for student involvement should be better defined.

- Successful conclusion of the project seems a bit tenuous, especially with the present budget. For example, what if agreement can't be reached with Johnson Controls, or if there is found to be a connection between the new production well and existing injection wells? The State of Oregon cost share is a positive factor.

4.3.3.5 Overall

Ratings of Three-member Peer Review Panel: Outstanding (4), Fair (2), Good (3)

Supporting comments:

- This project gets power on line, and will provide an educational platform for future geothermal professionals.

- Congressionally mandated project that most-likely would not have been done by the private sector. Better analyses should have been done before project initiation. However the project was done, so the GTP should work with OIT to ensure this system and auxiliary systems are used as educational tools for the benefit of the GT industry. No benefits will accrue to the EGS effort.

- If successful (by no means guaranteed at this point), this project would be a showcase to supplement the existing geothermal installations on the OIT campus. Since OIT has a worldwide reputation, this project will receive wide publicity, whether successful or not. One distraction in the presentation is numerous grammatical errors in the PowerPoint slides.

4.3.3.6 PI Response

My only comment really is that this was not intended to be an EGS project. That was just where we were placed for our Program Review.