OWL CREEK ENERGY PROJECT: A SOLUTION TO THE SPENT FUEL TEMPORARY STORAGE ISSUE

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ABSTRACT

In mid-1997, a Wyoming-led group of companies announced plans to develop a private interim spent fuel storage project in Wyoming to be known as the Owl Creek Energy Project. The idea for the Wyoming project had been developed under the earlier 1990s Nuclear Waste Negotiator Program. During that earlier activity, the project would have been a U.S. Department of Energy (DOE) project. The key differences from that earlier concept and others currently under consideration today are: a) it is funded on a totally private basis, b) the site is privately held land that has existing rail access, c) there is local political support, and d) a Wyoming company is the project sponsor.

The location for the Owl Creek Energy Project is a 2700-acre site located almost exactly in the center of the state near a small town called Shoshoni (population about 500). The site is a relatively flat, high plains piece of property typical of that section of Wyoming. The site has some very attractive features—namely, an existing active class A railroad that traverses it and an adjacent U.S. highway 20/26 on its south border, making access very simple.

Wyoming has a statute that governs the process for obtaining approval to construct and operate a spent fuel storage facility. The statute provides an opportunity for an applicant to obtain an early preliminary evaluation and decision from the state on the acceptability of the project. Such a preliminary decision is intended to "…determine whether a prudent investor, planner, builder and operator would decide to proceed with an application." Such an applicant must be prepared to address a list of 17 items identified in the statute ranging from financial and technical

capabilities, to the project schedule, to transportation plans, and a proposed benefits package for the state and local communities. This paper discusses the responses to some of these items.

The project has conducted a preliminary site environmental evaluation using available geologic, hydrologic and aerial surveys. The results are compared to criteria published by the U.S. Nuclear Regulatory Commission (NRC) and DOE for such a facility. The site has been judged to be acceptable when compared to the criteria. This paper discusses these conclusions.

In parallel with the Owl Creek Energy Project, the DOE completed the design of a facility that it would propose for such an interim storage site, and has submitted a description of it to the NRC for their review and approval. That facility is called the Central Interim Storage Facility (CISF) and can be found in NRC docket 72-21 dated June 1997. The Owl Creek Energy Project has been following the progress of that program and intends to adopt that design when the NRC approves it. This paper gives a summary of the key features of the CISF and how it is compatible with the project's site.

A key element of the state statute to be addressed is the demonstration that there is local community support for, or endorsement of, the project. The Owl Creek Energy Project has mounted a vigorous public information program in Wyoming. As of February 1998, there have been seven different, influential business development councils and industry associations in the site region that have published resolutions of project support, recommending that the governor approve the preliminary evaluation of the project. The nature and content of these groups and their endorsements are covered in the paper.

OWL CREEK ENERGY PROJECT

Introduction

On June 13, 1997, the Owl Creek Energy Project announced its intent to apply to the State of Wyoming for approval to build and operate a private interim spent fuel storage facility in Fremont County. The first step in obtaining such an approval is the application to enter into an agreement with the State to perform a Preliminary Nonbinding Feasibility Study as provided for in Statute 35-11-1501(1) passed in 1996. Mr. Robert Anderson, president of NEW Corporation of Riverton, Wyoming, made the announcement. This announcement followed internal work that had been done to assemble a team that has the capability to implement such a significant undertaking as the Owl Creek Energy Project. The key differences in the Project from other similar projects, past and present, are: a) it is funded on a totally private basis, b) the site is privately held land that has existing rail access, c) there is local political support, and d) a Wyoming company is the project sponsor.

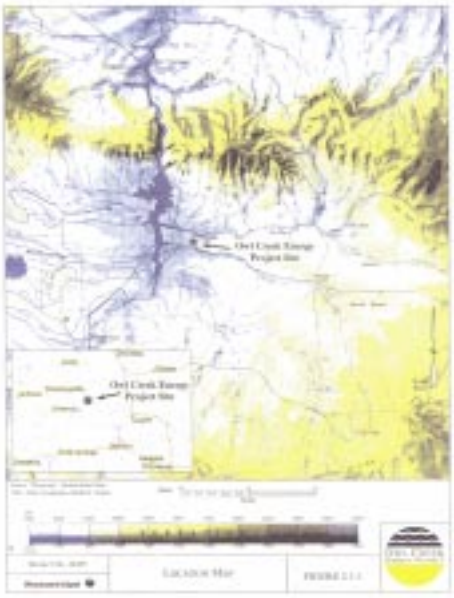


Figure 1: Site Location

Site Location and Features

The site is located very near the geographic middle of the state—more specifically, adjacent to the town of Shoshoni (population 500). The land area of the site is contained within Fremont County. Its largest town, Riverton, is located about 25 miles away by road.

The site encompasses about 2700 acres that are unused at the moment since they are fairly arid and, thus, not economic even for grazing livestock. U.S. highway 20/26 borders the southern boundary of the site, and a class A rail line traverses the northern half of the site, with an active private rail spur that runs in a northeast-southwest direction across the site property. The expected required land area for the project facilities and its operation is between 100 and 200 acres, representing a small portion of the total available.

Project History and Background

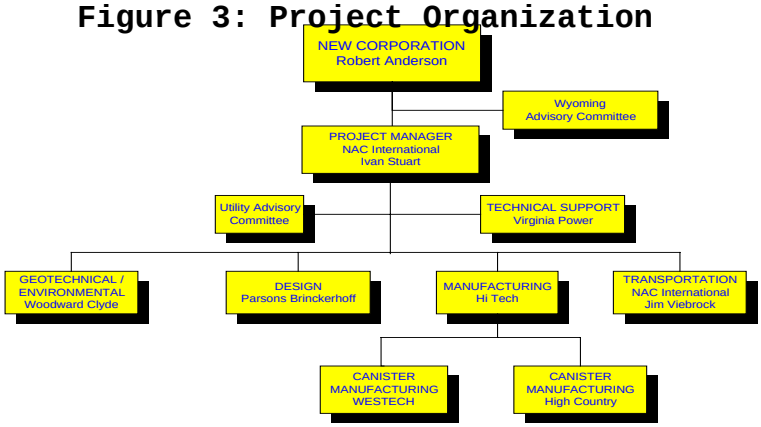
Figure 2: Site

Mr. Anderson and other interested citizens began thinking about such a project and its potential benefits to the state as early as 1992, during the era of the Office of the Nuclear Waste Negotiator operated by David Leroy. At that time, the project was intended to be a DOE-run facility, and Mr. Leroy was in search of a willing host for the facility. The interested local citizens group in Wyoming at that time accepted the funding, available to serious host candidates, to study the matter and come to a conclusion as to whether or not they wished to proceed further, including moving into the licensing and, later, construction phases of the project. After some intensive study, the local citizens declared their support for the project, but the governor at that time stated his opposition to further study of the project because of DOE's involvement, so the project was temporarily halted. Undaunted, Mr. Anderson went in search of private funding for the project and, in the process, asked NAC to assemble a team of respected nuclear-experienced companies that would have the credibility of a turnkey supplier group.

Project Implementation Team

The project team is led by NAC International of Atlanta, Georgia, acting as Project Manager and Prime Contractor; and assisted by Parsons Brinckerhoff of New York, New York, in the role of facility designer and construction manager; and Woodward-Clyde of Denver, Colorado, who will perform environmental studies and evaluations. Virginia Power Nuclear Services, an affiliate of the principal electric utility supplier located in Richmond, Virginia, is providing advice and counsel on the NRC licensing process based on their experience operating the first, and still operating, spent fuel dry cask storage facility in the U.S. Transportation of spent fuel to the Owl Creek site during its operating phase would be provided by NAC International.

Figure 3: Project Organization



In Casper, Wyoming, about 90 miles east of the site, there are two manufacturing companies known as High Country Fabricators Inc. and Westech Global Manufacturers, who have expressed an interest in supplying spent fuel containers to the project during its operations. In each case, the project team member companies have an industry-recognized record of success in their niche in the nuclear arena and complement each other's strengths. In the case of the two Casper manufacturers, their experience is not yet in the nuclear industry, so Hi Tech Manufacturing of Greensboro, North Carolina, is participating as a consultant to the project, providing the benefits of its recognized experience in building high-grade nuclear components for spent fuel container systems. The functional arrangements and interactions of the team members are shown in the project organizational chart. Planned additions to the team, at the appropriate time, are a utility advisory committee and a Wyoming advisory committee—the latter made up of interested local citizens.

Wyoming Project Review Process

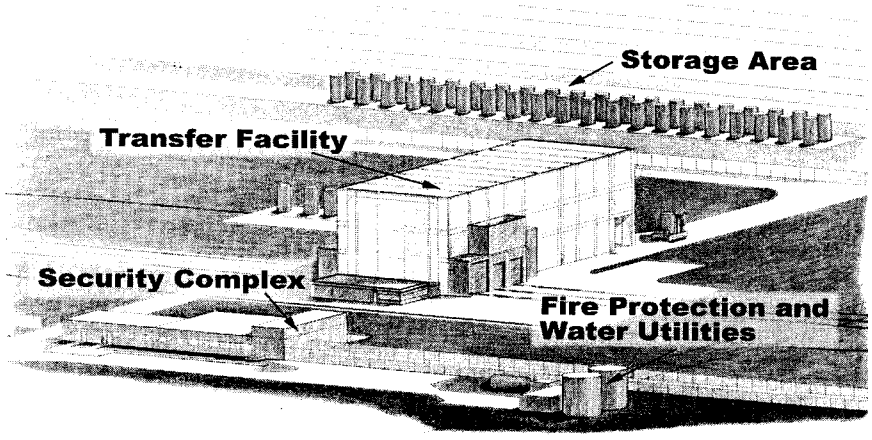
Statute 35-11-1501 provides for a two-step process for review of the Owl Creek Energy Project. Section 1506 (c) allows the applicant to request that a preliminary nonbinding feasibility study of the project be conducted by the Department of Environmental Quality with the concurrence of the Governor and the Legislature's Management Council, which comprises 13 chairpersons from designated committees. The purpose of this preliminary study is to have the state come to a conclusion that would "…determine whether a prudent investor, planner, builder and operator would decide to proceed with an application." The concept embodied here is that, assuming a positive outcome to this preliminary study, the applicant would then submit a complete application to construct and operate the facility. The statute goes on to recognize in section 1502

(b) that: "Any applicant for a permit to construct and operate a high-level waste storage facility shall share pertinent information relevant to both state and Nuclear Regulatory Commission permitting. It is the intent of this article that an applicant can supply information common to both state and federal permitting, without duplication of effort." The fee for the first step in the initial review process is $50,000; for the second step (the final review), the fee is $300,000.

The project submitted its request to the state for review under step one of the process on March 25, 1998. The application consisted of a two-volume report and an Executive Summary. Volume I contains a description of the proposed facility design and the site, while Volume II contains an item-by-item demonstration of how the project would comply with the 17 issues listed in section 1506 (c) of the statute. The application, in accordance with the statute's requirements, describes the project schedule, including the requested year-end 1998 preliminary study conclusion, so that the remaining project milestones can be achieved. The Governor has already replied to this Preliminary Study Application. He expressed the opinion that he believes the full review process is more appropriate for the Project, and has pledged to abide by the statute if the Project elects to proceed into the full review phase. In a press release dated April 7, 1998, Robert Anderson expressed agreement with the Governor's decision and emphasized the Project's plan to proceed. Thus, the project milestones and schedule now are as follows:

1997	Assemble Team - Done
1997-1998	Site Evaluation - Done
	Benefits Package - Done
1998-1999	Prepare NRC Application
	& State Application
1999-2001	Reviews Under Way
2001-2002	Construct Facility
2002	Initial Spent Fuel Acceptance

Figure 4: Project Organization



Facility Design Features

The proposed facility description in Volume I of the application is a condensed version of the DOE's extensive NRC application contained in docket 72-21 dated June 1997 and referred to as the Central Interim Storage Facility (CISF) design(2). This DOE application is currently undergoing NRC technical review, with completion and approval scheduled for early 1999. It is the intent of the Owl Creek Energy Project to adopt that design (hence its inclusion in the state preliminary study application), subject to the final NRC review conclusions. Some of the key features of that facility design are: a) a capacity of 40,000 MTU of spent fuel; b) a design lifetime of 40 years; and c) the ability to handle the variety of different container systems being proposed by different suppliers, many currently undergoing NRC reviews in their own separate applications. In addition to these features, the project has added the following specifications: 1) the project is totally, privately sponsored and operated; 2) the facility will be operated in a mode that has been termed "start clean, stay clean"—meaning that only spent fuel sealed in containers that need not be opened during their storage period at the facility will be accepted (in other words no bare fuel will be handled); 3) only commercial spent fuel from U.S. utilities will be accepted; 4) transportation to the site must be via rail; and 5) a fully funded decommissioning program will be incorporated into the project to return the site to a green-field condition at the conclusion of the project.

The CISF design was developed by the DOE on the basis that the facility is suitable for location essentially anywhere in the U.S. so, by employing that requirement, it turned out to be a very conservative design. For example, the seismic design of the facility buildings and storage pads is based on an assumed site design basis seismic loading or ground acceleration of 0.75 g. It has been estimated by Woodward-Clyde that the seismic design for a nuclear facility if it were sited in Wyoming should be approximately 0.3 g.

Anticipated Project Issues

Site Study

Volume II of the state application, as indicated earlier, responds point by point to the list of 17 issues enumerated in the statute. Probably the most interesting technical item contained in the volume is the preliminary site environmental study conducted by Woodward Clyde(3). It is contained in its entirety in an appendix to the volume. That study gathered up and analyzed all the available geologic, hydrologic and seismic data that exist for the state and nearby regions. In addition, aerial photographs were taken of the site area and ground reconnaissance identified: a) soil types and thickness, b) slope stability conditions, c) floodplain for the region, d) cultural and topographic conditions, e) identification of any mineral resources, and f) surveys of archaeological resources and protected species.

The data collected were analyzed and compared to criteria published in DOE/RW-0315P(4) for a desirable site for such an interim storage facility. There were six exclusionary criteria considered; and since the site met all of these, the site was judged to be acceptable for the proposed facility. In addition, there were 16 preferential criteria considered. These are the desirable features of a

site, but ones that, if not met, can be accommodated by appropriate design features. The site was judged on a preliminary basis to meet 11 of these additional criteria and maybe more with further study and easy-to-implement design requirements. An example of this latter case is the conclusion that the site is in an area classified as a wetlands region along a creek at the northern part of the site. This finding may be surprising to the residents of this high desert region of the state. However, location of the facilities away from this area of the site can satisfy the criterion related to wetlands. The other as yet unsatisfied criteria will be studied further as the project proceeds. Overall, as a result of the study, the site is judged to be suitable for the proposed project and is also considered ideal from a transportation access point of view.

The design of the proposed facility described earlier and the site suitability study included in the application constitute two of the required 17 items to be addressed by the statute. Time does not permit a full discussion of the remaining issues; however, four others that are considered key elements of the project will be treated in some detail at this point.

Transportation

Probably one of the areas of most interest to the public regarding such a facility, and about which there is the most amount of misinformation, is its transportation plans. The project plans call for exclusive use of rail for transportation of spent fuel to and from the Owl Creek site. There are two reasons for this: The first being the excellent access the site already has with a fully functional rail line traversing it; and the second the advent of NRC-approved, large-capacity storage and transportation containers that are suitable for rail shipments. These large containers make the handling of spent fuel both efficient and cost effective, while minimizing the number of shipments. This has a side benefit of avoiding another issue—namely, the use of, and concern related to, the state highways.

If the project were to achieve its intended capacity of 40,000 MTU, it would be storing somewhat less than half of the projected total spent fuel inventory for all current U.S. nuclear power plants. To achieve that capacity in a reasonable time frame, this would entail an acceptance rate for spent fuel at the Owl Creek site of about 3,000 MTU per year, which is slightly higher than the nationwide generation rate of the spent fuel. Such a rate would require 300 transport casks housing the containers to cycle through the site (note the casks are designed to be reusable). One approach suggests that each shipment should be, on average, a 10-railcar or 10-cask train from each power plant site for optimum handling campaigns at those sites. This would entail 30 trains of spent fuel per year arriving at Owl Creek, which is slightly more than one every two weeks. The 10-cask concept is suggested based on the need of two and one-half containers per plant per fuel cycle (each cycle being nominally 18 months long), and based on the typical arrangement of two power plant units at each site. In such a routine, a 10-cask train would leave each site once per three-year interval. There are a few sites with three power plant units and some with only one. Thus, more or fewer shipments per power plant site (or larger or smaller trains) could occur depending on the exact circumstances.

The nation’s approximately 100 nuclear power plants are located throughout 31 states, so the nearby rail line at the Owl Creek site would see trains connecting with several of the inter-

connecting railroads that traverse the country. All of the power plant sites have access to a rail line or are a reasonable distance from one, so that heavy-haul transport to the rail connection is feasible. (A program known as the Near-Site Transportation Infrastructure study conducted by NAC International for the DOE in the early 1990s confirmed this fact.) In any event, even with changes in the railway company's service infrastructure, rail transport using large-capacity containers is practical and cost efficient.

Project Benefits

Another interesting item that the applicant is required to address, according to the statute, is the range of benefits the nearby communities and the state might expect (item xi in the statute) and a related benefit—the range of taxes the state might reasonably impose on the project (item xii in the statute). These matters are addressed in the application in some detail but, of course, must be discussed with the state officials prior to any agreement on the specifics. For example, one evaluation presented in the application looks at a state fee that could be imposed on each kilogram of spent fuel each year that it is stored at Owl Creek. At the point the facility has reached its capacity of 40,000 MTU, this fee would produce an annual revenue to the state of $20,000,000 expressed in 1998 dollars. Obviously, a smaller quantity of spent fuel at the site would result in proportionately smaller revenue to the state. Such a lower amount could be either due to less-than-planned use of the facility, or be applicable during the period when the site inventory is building up to the planned capacity. In this regard, the planning bases presented in the application are an initial receipt rate of 400 MTU the first year, followed by 1,000 MTU the second year, then 2,000 MTU the third year, and 3,000 MTU each year thereafter until the capacity is reached. With this profile, the site reaches its capacity in its 16th year of operation, with only 600 MTU being received in that year to get to the capacity. Another source of revenue for the state is the decommissioning fund that accumulates during the life of the project. This fund will be required to be protected in conservative investments, probably in the state, but subject to taxes on any earned income on the fund. The project plan for this fund is an amount that accumulates to $136,000,000, exclusive of any income that could be achieved through prudent investments.

Regarding the expected benefits to the local communities, this will take the form of jobs directly related to the construction and operation of the facility in the nearby vicinity of the site, as well as an increase in the infrastructure of support jobs that traditionally follow when a project of this magnitude is put in place. The University of Wyoming has performed an independent economic impact analysis of the proposed Owl Creek Energy Project(6). While the economic benefits of the Project will be felt statewide, the detailed analysis performed concentrated on the benefits to the two countries nearest the project site. The analysis was done by methods commonly used by the Department of Commerce, many state governments and industry, as well as applied throughout the world.

The results show nearly $2 billion of local income generation over the life of the Project, and job creation approaching 2,000 jobs at its peak of operation. Neither of these estimates takes into account that the Project is proposing a state cash benefits package of up to $20 million per year that could be earmarked for special uses such as further business development, job creation,

research funding, or other economic-multiplying effects within the state or the local communities.

The analysis shows that job creation will occur in the rail transportation sector, both the retail and wholesale trade, eating and drinking establishments, banking, health care, and in state and local governments. The degree to which each sector is benefited varies during each phase of this Project. One additional important sector affected by the Project is creation of manufacturing jobs to fabricate needed metal containers. In its peak years of operation, a period that lasts about 10 years, the Project generates almost $80 million per year additional income and about 3, 000 jobs. These benefits are beyond the estimated nearly $1 million property taxes the Project would pay and the $20 million per year state benefits payments proposed by the Project.

Project Local Support

The last item I would like to discuss that is covered in the application is the evidence of support for the project by nearby communities (item xvii in the statute). This item has been given major attention by the project up to this time, since clearly it is an important one for the upcoming state review process. The support to date has come from representatives of every city and town in Fremont County. This includes business groups from within Lander, Riverton and Shoshoni, the adjacent town to the site. For example, the city of Riverton, acting through its City Council, has endorsed the study of the project. The endorsement in that case has taken the form of a Resolution passed by the Community Development Association. The Resolution reads in part

"... NOW, THEREFORE BE IT RESOLVED that the Riverton Community Development Association supports the continued safe and responsible use of nuclear power and the concept of the Owl Creek Energy Project by entering into a preliminary, non-binding feasibility study, and;

"IT IS HEREBY FURTHER RESOLVED, that the Riverton Community Development Association requests the Governor and the Management Council to authorize such a feasibility study."

In the case of the Shoshoni Chamber of Commerce, that endorsement took the form of a letter to the President of the Owl Creek Energy Project from the Chamber President stating simply, " The Shoshoni Chamber of Commerce definitely supports the continuation of the feasibility study…." The statewide Mining Association also endorsed the project, issuing a similar resolution.

CONCLUSION

In conclusion, the Owl Creek Energy Project is moving ahead with a private industry support team in place. By adopting the generic CISF design, the project is assured compatibility with the DOE's program, while at the same time minimizing the NRC review process the project will have to face. Most importantly, judging by the nature of the endorsements the project has received so far, there is reason to believe that there will be a positive conclusion by the responsible state authorities. The technical application prepared by the Project and the economic

benefits assessment completed by the University of Wyoming, would certainly support such a conclusion on the technical level.

The Owl Creek Energy Project provides a valuable option to solving the impasse in temporary storage needed prior to opening of Yucca Mountain, demonstrating again that private industry can solve what appear to be intractable issues for government resolution.

REFERENCES

1. Wyoming Statute 35-11-1501 titled “Public Health and Safety, Article 15, Radioactive Waste Storage Facilities,” adopted in 1995.

2. U.S. Department of Energy application submitted to the U.S. Nuclear Regulatory Commission titled “Central Interim Storage Facility Topical Safety Analysis Report” dated May 1, 1997, identified as NRC docket 72-21, and supplements thereto.

3. “Compilation and Analysis of Environmental Data in Support of the Proposed Independent Spent Fuel Storage Installation (ISFSI) at the Owl Creek Energy Site, near Shoshoni, Wyoming,” December 1997, prepared by Woodward Clyde, Denver, Colorado.

4. U.S. Department of Energy, “Preliminary Site Requirements and Considerations for a Monitored Retrievable Storage Facility,” dated 1991, DOE/RW-0315P.

5. “Near-Site Transportation Infrastructure Project,” Oak Ridge National Laboratory, ORNL/SUB/86-97393/7, September 1995.

6. “Economic Analysis of the Owl Creek Energy Project,” University of Wyoming, by Dr. Shelby Gerking, Chairman, Economics Department, Laramie, Wyoming, January 1999.