

## PUBLIC INTERACTION AND EDUCATIONAL OUTREACH ON THE YUCCA MOUNTAIN PROJECT

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### **Introduction and Background**

In July 2002, the U.S. Congress approved Yucca Mountain in Nevada as the nation's first long-term geologic repository site for spent nuclear fuel and high-level radioactive waste. This major milestone for the country's high-level radioactive waste disposal program comes after more than twenty years of scientific study and intense public interaction and outreach. This paper describes public interaction and outreach challenges faced by the U.S. Department of Energy's (DOE) Yucca Mountain Project in the past and what additional communication strategies may be instituted following the July 2002 approval by the U.S. Congress to develop the site as the nation's first long-term geologic repository for spent nuclear fuel and high-level radioactive waste.

The DOE public involvement activities were driven by two federal regulations—the National Environmental Policy Act (NEPA) and the Nuclear Waste Policy Act (NWPA) of 1982, as amended. The NEPA required that DOE hold public hearings at key points in the development of an Environmental Impact Statement (EIS) and the NWPA required the agency to conduct public hearings in the vicinity of the site prior to making a recommendation regarding the site's suitability. The NWPA also provided a roadmap for how DOE would interact with affected units of government, which include the state of Nevada and the counties surrounding the site.

Because the Department anticipated and later received much public interest in this high-profile project, the agency decided to go beyond regulatory-required public involvement activities and created a broad-based program that implemented far-reaching public interaction and outreach tactics. Over the last two decades, DOE informed, educated, and engaged a myriad of interested local, national, and international parties using various traditional and innovative approaches. The Yucca Mountain Project's intensive public affairs initiatives were instrumental in involving the public, which in turn resulted in thousands of comments on various aspects of the program. These comments were considered in the development of the EIS and weighed in the Secretary of Energy's decision to recommend the site.

### **The Continuing Importance of Education and Public Outreach**

As the Project moves into the next phase—applying for a license from the Nuclear Regulatory Commission (NRC) to construct a repository—the challenge of public interaction and outreach intensifies, thus becoming increasingly important to provide numerous programs for educational purposes and to provide effective communication tools to disseminate information to the public. Currently, as well as in the past, these programs have included Yucca Mountain Project site tours, a speakers bureau, exhibits, and educational

outreach programs, along with public workshops, poster sessions, and traditional and multi-media public hearings.

With major emphasis on developing the NRC license application for the repository, the DOE is working to meet this challenge and build public trust and confidence in the Yucca Mountain Project. The DOE continues its development of innovative strategies and tactics to inform, educate, and interact with the public regarding four key elements of the Project. Those elements are the NRC licensing process, the transportation program, repository science and technology, and the Program's shift from the site recommendation culture to a nuclear licensing culture. Using various communication vehicles to tell the Yucca Mountain story and provide the public with accurate information, the DOE seeks to dispel misinformation and address public concerns.

Important to the Project's success is the communication of accurate information to a wide variety of stakeholders including local governments, agencies, citizens groups, business associations, schools, and the news media. Providing educational and informational opportunities to these stakeholders enhances public awareness, addresses their questions and concerns, and fosters a more complete and balanced understanding of the Project. Key to this better and balanced understanding is the Project's maintenance of proactive public outreach programs. While executing a proactive outreach program may not fully mitigate or alleviate all public concerns or opposition, innovative outreach and education programs can help build better Project understanding among community leaders, educators, and the general public.

Education provides the backbone of the Yucca Mountain Public Outreach Program. This educational foundation has its roots in Jean Piaget's educational theories of cognitive development, which capitalizes on the human's natural curiosity. Piaget's theory suggests hands-on experiences help "students" of all levels construct an increasingly more accurate and complete understanding of the world and to discover relationships among concepts and ideas.<sup>(1)</sup>

In order to "construct" an increasingly more accurate and complete understanding of the Yucca Mountain Project, the DOE public outreach program currently includes the following activities:

- **Speakers Bureau** – Scientists and engineers working on the Yucca Mountain Project have conducted twenty years of intensive studies of the mountain to determine its suitability for disposing of spent nuclear fuel and high-level radioactive waste in an underground repository. Presentations are available as a public service to any group, school, organization or association interested in learning more about the Project. Speakers range from generalists to specialists covering topics including a general Project overview, Yucca Mountain-area geology, hydrology, volcanology, environmental science as it applies to the Yucca Mountain region, earthquakes, radiation, transporting nuclear waste, socioeconomic impacts of the Project, archaeology, paleontology, and meteorology of the Yucca Mountain area.<sup>(2)</sup>

- **Yucca Mountain Science Centers** - Located in Las Vegas, Pahrump, and Beatty, Nevada, the Project's science centers feature exhibits, video displays, interactive computer programs, educational programs, and other educational resources that address the many aspects of the Yucca Mountain Project.

In Las Vegas, science center visitors can take a simulated elevator ride down to the Climax Mine Spent fuel Test, a replica of one of the first experiments conducted to evaluate how radioactive waste could be placed underground, stored, and then retrieved successfully. They also can take a "virtual" tour of Yucca Mountain with the help of a computer program. The science centers conduct a wide range of educational programs including "Discovery Day" events that provide interactive learning experiences for the whole family; "Walk-in-talk" volunteers explain the desert environment, Native American culture, geology, volcanoes, and other subjects; and school programs that educate students and teachers on scientific and environmental issues.

Educational resources at the science centers include literature on scientific fields – geology, health physics, environmental science, hydrology, and the study of volcanoes; video updates about new and continuing scientific work on the Project; and videos on topics ranging from atoms to electricity and from earthquakes to zeolites. <sup>(3)</sup>

- **Yucca Mountain Tour Program** - The Yucca Mountain Project offers public open house tours of the underground laboratory inside Yucca Mountain at least 6 times each year. The tour provides the opportunity to talk with experts in the fields of geology, engineering, waste management, and environmental science. In addition, the tour program runs weekday tours for special interest groups. In FY02, over 6,200 people visited the site. During October 2002 alone - the first month of FY03 - the tour program provided 33 tours for more than 1,100 visitors.
- **Yucca Mountain Exhibit Program** – The Yucca Mountain Project Exhibit Program attends many key technical and non-technical functions annually. The Project exhibits at conferences relating to geology, nuclear energy, and support county fairs in Nevada. Continuing a long history of commitment to the public, the Yucca Mountain Project 2001/2002 Exhibit Program attended the following events:
  - North Las Vegas Chamber of Commerce Business Exposition
  - Pahrump Harvest Festival
  - Nevada State Science Teacher's Association Conference
  - Geologic Society of America Annual Meeting
  - American Nuclear Society Fall Meeting
  - American Geophysical Union
  - American Association for the Advancement of Science
  - Waste Management Symposia 2002
  - Rocky Mountain Social Studies Conference
  - Pahrump Business Exposition
  - Futures Exposition, Clark County School District

- National Science Teacher's Annual Meeting
- National Assoc. of Purchasing Managers Supplier Opportunity Faire 2002
- Clark County School District's Advanced Technologies Academy Career Day
- Government 8 Energy Minister's Meeting
- Race for the Cure
- DOE's 3<sup>rd</sup> Annual Small Business Conference
- American Geophysical Union
- National Education Association Annual Meeting
- Las Vegas Chamber of Commerce Business Exposition
- National Association of Counties Annual Convention
- National Conference of State Legislatures Annual Meeting
- International Council on Systems Engineering (INCOSE)
- ANS Spectrum 2002
- Lincoln County Fair
- Eureka County Fair
- Nevada League of Cities
- White Pine County Fair
- Nevada State Fair
- Goldfield Centennial Celebration
- Tri County Fair (Inyo County)
- Society of Professional Journalists
- Association of Engineering Geologists and American Institute of Professional Geologists Joint Conference

### **Use of New Technologies**

Discovering ways to translate project information and communicate this information to local governments, agencies, citizens' groups, schools, the news media, and other stakeholders is critical. With these facts in mind, the BSC Public Relations department set out to create a presentation that would bring the "mountain" to the public using the latest electronic technology.

Most citizens of Nevada as well as other citizens of other states do not have the opportunity to take the site tour. The objective in preparing a multimedia presentation was to "bring the mountain to the masses" so that many more people could "see" the site and come away with project key messages.

The multimedia virtual presentation that was created uses a variety of media including video, graphics, and still photography of the Yucca Mountain setting in the Mojave Desert of southern Nevada. The presentation includes views of the terrain, descriptions of the geology, locales, and details of the science and engineering tests conducted at Yucca Mountain. In addition, the tour includes a short visit to the underground Exploratory Studies Facility, the nearly 7 miles of tunnels, drifts, alcoves and niches in which scientific and engineering tests have been conducted.

The presentation introduces, via video, project scientists who discuss their areas of expertise and how that applies to the evaluation of the repository and the determination of its performance to protect health and safety. The modularity of the presentation allows easy updates to current project news.

Currently, the CD is intended for use by a knowledgeable Project staff. It was not designed to stand-alone. There are over 60 photos and graphics available to a presenter located under eight different buttons on the Exploratory Studies Facility layout. A presenter can amend a presentation to any length or vary the content according to his audience by navigating to selected content and photos. The design of the CD allows for flexibility.

New "buttons" can be added with additional technical data. Additional video is easily introduced. The presentation format can be modified to a departmental level or be made more project specific with little effort. A standalone version, whether produced on a CD, DVD, or WEB based format is a clear option for future development. Although this avenue would require additional text or audio in order to "substitute" for the presenter, the possibilities for public outreach use are almost endless.

### **Conclusions**

The DOE will continue to develop innovative strategies and tactics to inform, educate, and interact with the public as well as continuing current programs that have proven successful in providing the public with accurate information.

### **References**

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