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by ***Carl Weston Myers***

Gulf Coast Salt Domes: A Potential Underground Space Resource for the Nuclear Renaissance?

By mid-century, 200 or more new nuclear power plants could be deployed in the U.S. to meet the growing demand for electricity. The conventional approach would be to site these new reactors at the earth's surface. An alternate approach would be to site them underground. Past studies of underground siting indicated a number of safety and security advantages, and no insurmountable engineering problems, but an almost certain cost increase resulting from underground construction. However, a new concept for underground reactor siting—the underground nuclear park—has the potential to actually reduce cost relative to surface siting. Massive salt deposits, both bedded and domal, are a potentially favorable rock type for hosting underground nuclear parks. The shallow piercement salt domes in the Gulf Coast sedimentary basin should be examined for this application. The idea would be to site an array of nuclear reactors, each within its own sealed and isolated chamber, hundreds of feet deep inside one or more salt domes. Nuclear waste management facilities supporting the reactors would be collocated nearby and connected to the reactors by tunnels. Energy conversion equipment could be either underground or at the earth's surface. The heat transfer fluids that move through the reactor cores would be isolated from the earth's surface using heat exchangers. If underground nuclear parks in Gulf Coast salt domes should prove feasible, then they could be used to supply baseload and peaking electricity, and possibly hydrogen, to the region and nation analogous to oil and gas today. ■

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Biographical Sketch

Dr. Carl Weston (Wes) Myers worked at Los Alamos National Laboratory from 1981 to 2005. Wes has held several R&D management positions and founded and served for 12 years as the division leader of the Earth and Environmental Sciences Division. In that position he was involved in scientific and engineering studies of the proposed nuclear waste repository site at Yucca Mountain, and also developed collaborative R&D projects with the U.S. oil and gas industry. He served two years in Washington D.C. where he assisted the Department of Energy with international cooperative activities in geologic disposal of nuclear waste—with emphasis on Russia. Prior to Los Alamos, he worked for 5 years with Rockwell Hanford Operations where he pioneered the application of borehole-based paleomagnetic and wireline logging techniques to identify and correlate basalt units in the deep subsurface of the central Columbia Plateau. Early in his career he was an assistant professor at Appalachian State University in Boone, North Carolina, and development geologist with Chevron in Lafayette, Louisiana. In 2002 he developed the concept of the underground nuclear park as a possible new approach for deployment of nuclear power reactors and their supporting waste management facilities. He retired from Los Alamos in 2005 to expand and promote the concept. He received a BS and MS in geology from the University of Georgia, a PhD in Earth Sciences from the University of California at Santa Cruz, and completed a Post-Doctoral Fellowship at the State University of New York at Stony Brook.

Editor Note: *The Houston Energy Council was founded in 1999 to benefit the associated member societies and to promote communication and cross-discipline programs for societies related to the Houston energy industry.*