

GEOHERMAL PIPELINE

Progress and Development Update
Geothermal Progress Monitor

BOOK REVIEWS

Geothermal Direct-Use Engineering and Design Guidebook, 3rd Edition (Lund, J. W.; Lienau, P. J and B. C. Lunis, editors). This is an update of the popular direct-use guidebook, last published in 1991. All of the 19 chapters have been revised based on technical assistance experience at the Geo-Heat Center and reflecting current trends in industry. The 470-page book covers material on Lessons Learned, Nature of Geothermal Resources, Exploration for Direct-Heat Resources, Geothermal Fluid Sampling Techniques, Drilling and Well Construction, Well Testing and Reservoir Evaluation, Materials Selection Guidelines, Well Pumps, Piping, Heat Exchangers, Space Heating Equipment, Absorption Refrigeration, Greenhouses, Aquaculture, Industrial Applications, Engineering Cost Analysis, Regulatory and Commercial Aspects, and Environmental Considerations. The Guidebook can be ordered from the Geo-Heat Center, Oregon Institute of Technology, Klamath Falls, OR 97601 (Ph: 541-885-1750) for a cost of \$49.00.

The Geysers Album: Five Eras of Geothermal History.

This is a beautiful new 52-page book from the California Division of Oil, Gas and Geothermal Resources, authored by Susan Hodgson (1997). It presents a panorama of geothermal events at The Geysers in northern California, covering five historical eras overlapping in a mosaic of time. It is an intriguing story about man's interaction with geothermal energy in this unique resource area - including a wealth of photographs and information never before published. The eras covered are (1) untouched wilderness, (2) the time when Indians in the region first found the area 12,000 years ago, (2) organized tourism that began around 1848 and ended in 1980 when the last remnants of The Geysers Resort were razed, (3) the age of electric power development to light The Geysers Resort starting in 1921 and ending in the early 1930's, and (5) modern power development which began in 1955, when the first modern steam well was drilled in the area. Copies are available for only \$5.00 each from the California Division of Oil, Gas and Geothermal Resources, 801 K Street, MS-20-20, Sacramento, CA 95814-3530, telephone: 916-445-9686.

Charging Ahead - The Business of Renewable Energy and What It Means for America, by John J. Berger. A John Macrae Book, Henry Holt and Company, NY (1997) - \$30.00. This is 399-page book covering alternative energy, including nine chapters on solar power, five on wind power, two on bioenergy, one on geothermal energy, and several general chapters. Chapter 20 - Underground Power - covers "Geothermal's Rocky Road."

The chapter is primarily devoted to geothermal power generation, covering the early history of development in New Zealand, Italy and The Geysers. The Geysers section describes work by B.C. McCabe, Joseph Aidlin and Carel Otte. "The Salton Sea Challenge", "Foreign Development Opportunities" and "Hot Rocks" are also discussed. Geothermal is described as "An Underutilized Resource", as ". . . the use has been slight nationwide, due in part to relatively low levels of federal research-and-development support and to low-cost fossil fuels....Globally, geothermal energy exists in vast quantities, including many locations throughout the United States, especially in the West and abroad. However, only a small part of the resource base can be developed economically because of current technology limitations. If one day the limitations are overcome, American would have an energy supply far beyond its needs." The chapter also address the environmental benefits of geothermal power as compared to fossil fuel sources, and that it can provide base load as well as peaking power, "...an important feature relative to other non-base load renewables." "Yet with all these attractive features and the potential for expanded capacity, geothermal energy has not been a major national research priority." This is what we have been preaching for years!!!

Mineral and Thermal Groundwater Resources by Marius

Albu of Romania, David Banks of Norway and Harriet Nash of the UK, Chapman & Hall, London and New York (1997). This is a 447-page book with an exorbitant price of \$150. Part One covers the history, use, and origins of mineral and thermal waters, thus it is not limited to geothermal fluids. Several chapters are devoted to exploring for, modeling and exploiting mineral water sources, along with concerns for the environmental issues and conservation of the resource. Part Two deals with case studies from Iceland, England, Lithuania, the north Caucasus area of CIS (the former Soviet Union), Norway, The Czech Republic and two areas of Romania. All of these areas have made use of mineral waters and some have developed spas based on the therapeutic use of these fluids. It does have geothermal applications in two chapters on "Thermal Water Systems," which address the problems of scaling and corrosion, drilling and borehole construction, transport, heat recoverability, heat regeneration, and resource management. It also discusses geophysical and geochemical investigations and analysis, and the estimation of the potential yield of and quantity of heat stored in a resource. The section on Iceland discusses the Reykjavik and Svartsengi district heating systems in detail, and would be of interest to geothermal readers, however, there is very little engineering design information elsewhere in the book. A great number of geothermal experts are referenced in the book, both U.S. and international scientists. Of course, the

chapter on Norway deals with cold water resources, but they do bottle and export the natural spring water. Many of the chapters use fairly complicated mathematical analysis such as numerical modeling of groundwater systems and there are some fairly involved chemistry discussions, including geothermometry. This is an excellent book for those interested in developing a bottled mineral water source or therapeutic spa for commercial purposes, for either cold and hot water resources, however the reader does need a technical background in order to appreciate some of the material. It is a well written book, and covers both the historical perspective as well as providing assistance for the future developer and entrepreneur.

MEETINGS

New Zealand Geothermal Association Direct Heat Development Seminar, Quality Inn Conference Centre, Taupo, New Zealand, July 2-3, 1998. Contact: Ian Thain (email: i.a.thain@xtra.co.nz), Geothermal & Energy Technical Services, Ltd., 19 Cherry Lane, Acacia Bay, Taupo, New Zealand (phone: 64 (7) 378-1707).

33rd Intersociety Energy Conversion Engineering Conference (IECEC), Sheraton Colorado Springs Hotel, Colorado Springs, CO, August 2-6, 1998. "Meeting Global Energy and Environmental Needs." Contact: ANS Proceedings Office (email: www.inspi.ufl.edu/IECED98), IECEC '98, 555 North Kensington Ave., La Grange Park, IL 60526. (Phone: (708) 579-8253).

17th World Energy Council Congress, George R. Brown Convention Center, Houston, TX, September 13-17, 1998. Contact: World Energy Congress, Inc., 1620 Eye Street, N.W., Suite 1050, Washington, D.C. 20006.

International Summer School, Ponta Delgada and Ribeira Grande, Azores, Portugal, September 14-19, 1998. International Workshop on Heating Greenhouses with Geothermal Energy (14 Sept.), International Seminar on Electricity Production of Geothermal Energy (15 Sept.), and International Course on Economy of Integrated Geothermal Projects (16-18 Sept.). Contact: Dr. Kiril Popovski, International Summer School on Direct Application of Geothermal Energy, ul. Dame Gruev br.1-III/16, 91000 Skopje, Macedonia, or Marnell Dickson, IIRG (email: marnell@iirg.pi.cnr.it), Piazza Solferino 2, 56126 Pisa, Italy (phone: 39 (50) 46-069)

Geothermal Resources Council Annual Meeting, Town & Country Hotel, San Diego, CA, September 20-23, 1998. Contact: GRC (email: earth307@concentric.net or www.geothermal.org), PO Box 1350, Davis, CA 95617 (phone: (530) 758-2360).

Geothermal Village Power Workshop, Eldorado Hotel, Reno, NV, November 4-6, 1998. (USDOE, CEC, Sandia Nat. Lab., and GRC). Contact: Geothermal Resources Council, Davis, CA or John T. Finger, Sandia National Laboratories, PO Box 5800, MS 1033, Albuquerque, NM 87185 (phone: (505) 844-8089).

Energex '98 Conference, Bahrain Conference Centre, Holiday Inn Hotel, Myoneme, Bahrain, November 19-21, 1998. Contact: Conference Secretariat, (email: info@hfasin.com). Dr. W. E. Alnaser, Dean of Scientific Research, University of Bahrain, PO Box 32028, State of Bahrain (Ph: 973-683278/688396/682582).