Geothermal Reservoir Engineer Job

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Reservoir Characterization Infobase Holdings, Inc
Geothermal energy provides more than one third of the energy consumed in Iceland. Its primary use is for space heating and most of the 28 public hitaveitur (district heating services) in Iceland utilize small low-temperature geothermal fields that have a natural heat output of only a few 100 kW{sub t} to a few MW{sub t}. All of these small reservoirs respond to production by declining pressure and some by declining temperature. During the 1980's the emphasis in geothermal research in Iceland shifted from exploration to reservoir engineering. The reservoir engineering work carried out concurrent with the exploitation of these small fields includes: testing of individual wells, field wide tests, monitoring the response of reservoirs to long-term production and simple modeling.

Energy Research Abstracts Academic Press
Geothermal Reservoir EngineeringAcademic Press

Geothermal Reservoir Engineering Elsevier
Geothermal Well Test Analysis: Fundamentals, Applications and Advanced Techniques provides a comprehensive review of the geothermal pressure transient analysis methodology and its similarities and differences with petroleum and groundwater well test analysis. Also discussed are the different tests undertaken in geothermal wells during completion testing, output/production testing, and the interpretation of data. In addition, the book focuses on pressure transient analysis by numerical simulation and inverse methods, also covering the familiar pressure derivative plot. Finally, non-standard geothermal pressure transient behaviors are analyzed and interpreted by numerical techniques for cases beyond the limit of existing analytical techniques. Provides a guide on the analysis of well test data in geothermal wells, including pressure transient analysis, completion testing and output testing Presents practical information on how to avoid common issues with data collection in geothermal wells Uses SI units, converting existing equations and models found in literature to this unit system instead of oilfield units
Critique Panel Comments on Reservoir Engineering DOE Geothermal Technology Development John Wiley & Sons
As our geothermal fields mature and the inevitable problems arise with their exploitation, it will be reservoir engineers that will evaluate our possible future courses of action in order to solve these problems. But first they must have the right tools and data. To date, the best reservoir engineering tool we have in geothermal is the reservoir simulators. The reason for this is our severe lack of definition of reservoir parameters. Within a simulation there are checks and balances on the interrelation of reservoir parameters that keep the result within certain realistic bounds. These uncertain parameters make most traditional reservoir engineering methods such as volumetrics of little use for anything beyond preliminary work. Parametric studies such as those by Mike Shook help in determining the range and sensitivity of unconstrained variables in simulator work and are valuable. However, as two non-unique simulations can yield similar results on an established field configuration, the same two can then give different results if used for investigating different future scenarios, injection cases or other what-if's. Therefore to use simulators as a development or management tool with greater confidence, a more unique solution is desired, requiring greater definition of the parameters input into the model. By determining these parameters a greater assortment of reservoir engineering methods also becomes available. However, I do not see enough research directed to determining these parameters at this time, and there should be more. These parameters and other methods will be needed to use in the important slim hole evaluations being researched, as simulations are more for developed producing fields with some history, not exploration prospects. One of the best ways to get some of these parameters is by logging methods. The slim hole tools discussed by Peter Lysne on Tuesday afternoon will be needed to get these parameters in exploration prospects. Besides a natural gamma ray spectrometry tool I see a neutron tool as a first choice, and a resistivity tool as a second choice that will also be needed as a minimum logging suite. The research that is needed soon, rather than later, is what Peter was calling inversion technology, and what I would call the calibration of logging responses to geothermal reservoirs.
Gulf Professional Publishing
The Arab oil embargo of 1973 focused national attention on energy problems. A national focus on development of energy sources alternative to consumption of hydrocarbons led to the initiation of research studies of reservoir engineering of geothermal systems, funded by the National Science Foundation. At that time it appeared that only two significant reservoir engineering studies of geothermal reservoirs had been completed. Many meetings concerning development of geothermal resources were held from 1973 through the date of the first Stanford Geothermal Reservoir Engineering workshop December 15-17, 1975. These meetings were similar in that many reports dealt with the objectives of planned research projects rather than with results. The first reservoir engineering workshop held under the Stanford Geothermal Program was singular in that for the first time most participants were reporting on progress inactive research programs rather than on work planned. This was true for both laboratory experimental studies and for field experiments in producing geothermal systems. The Proceedings of the December 1975 workshop (SGP-TR-12) is a remarkable document in that results of both field operations and laboratory studies were freely presented and exchanged by all participants. With this in mind the second reservoir engineering workshop was planned for December 1976. The objectives were again two-fold. First, the workshop was designed as a forum to bring together researchers active in various physical and mathematical branches of the developing field of geothermal reservoir engineering, to give participants a current and updated view of progress being made in the field. The second purpose was to prepare this Proceedings of Summaries documenting the state of the art as of December 1976. The proceedings will be distributed to all interested members of the geothermal community involved in the development and utilization of the geothermal resources in the world. Many notable

occurrences took place between the first workshop in December 1975 and this present workshop in December 1976. For one thing, the newly formed Energy Research and Development Administration (ERDA) has assumed the lead role in geothermal reservoir engineering research. The second workshop under the Stanford Geothermal Program was supported by a grant from ERDA. In addition, two significant meetings on geothermal energy were held in Rotarua, New Zealand and Taupo, New Zealand. These meetings concerned geothermal reservoir engineering, and the reinjection of cooled geothermal fluids back into a geothermal system. It was clear to attendees of both the New Zealand and the December workshop meetings that a great deal of new information had been developed between August and December 1976. Another exciting report made at the meeting was a successful completion of a new geothermal well on the big island of Hawaii which produces a geothermal fluid that is mainly steam at a temperature in excess of 600 degrees F. Although the total developed electrical power generating capacity due to all geothermal field developments in 1976 is on the order of 1200 megawatts, it was reported that rapid development in geothermal field expansion is taking place in many parts of the world. Approximately 400 megawatts of geothermal power were being developed in the Philippine Islands, and planning for expansion in production in Cerro Prieto, Mexico was also announced. The Geysers in the United States continued the planned expansion toward the level of more than 1000 megawatts. The Second Workshop on Geothermal Reservoir Engineering convened at Stanford December 1976 with 93 attendees from 4 nations, and resulted in the presentation of 44 technical papers, summaries of which are included in these Proceedings. The major areas included in the program consisted of reservoir physics, well testing, field development, well stimulation, and mathematical modeling of geothermal reservoirs. The planning forth is year's workshop and the preparation of the proceedings was carried out mainly by my associate Paul Kruger and his secretary for the program, Marion Wachtel. A great deal of the work involved in conducting the workshop was also carried out by students in the Stanford Geothermal Program under Dr. Paul Atkinson, Program Manager. We would like to express our deep gratitude to the Energy Research and Development Administration whose financial support of this workshop made the program and these proceedings possible. Henry J. Ramey, Jr. Stanford University December 3, 1976.

Geothermal Reservoir Engineering Research. Fourth Annual Report, October 1, 1983-September 30, 1984 Academic Press

A comprehensive guide to the types of green jobs that are available in the workforce today, the skills and training needed, funding available, salary expectations, and more.

Status of Geothermal Reservoir Engineering Research Projects Supported by USDOE National Academies Press

INTRODUCTION TO THE PROCEEDINGS OF THE SIXTH GEOTHERMAL RESERVOIR ENGINEERING WORKSHOP, STANFORD GEOTHERMAL PROGRAM Henry J. Ramey, Jr., and Paul Kruger Co-Principal Investigators Ian G. Donaldson Program Manager Stanford Geothermal Program The Sixth Workshop on Geothermal Reservoir Engineering convened at Stanford University on December 16, 1980. As with previous Workshops the attendance was around 100 with a significant participation from countries other than the United States (18 attendees from 6 countries). In addition, there were a number of papers from foreign contributors not able to attend. Because of the success of all the earlier workshops there was only one format change, a new scheduling of Tuesday to Thursday rather than the earlier Wednesday through Friday. This change was in general considered for the better and will be retained for the Seventh Workshop. Papers were presented on two and a half of the three days, the panel session, this year on the numerical modeling intercomparison study sponsored by the Department of Energy, being held on the second afternoon. This panel discussion is described in a separate Stanford Geothermal Program Report (SGP-TR42). This year there was a shift in subject of the papers. There was a reduction in the number of papers offered on pressure transients and well testing and an introduction of several new subjects. After overviews by Bob Gray of the Department of Energy and Jack Howard of Lawrence Berkeley Laboratory, we had papers on field development, geopressured systems, production engineering, well testing, modeling, reservoir physics, reservoir chemistry, and risk analysis. A total of 51 papers were contributed and are printed in these Proceedings. It was, however, necessary to restrict the presentations and not all papers printed were presented. Although the content of the Workshop has changed over the years, the format to date has proved to be satisfactory. The objectives of the Workshop, the bringing together of researchers, engineers and managers involved in geothermal reservoir study and development and the provision of a forum for the prompt and open reporting of progress and for the exchange of ideas, continue to be met . Active discussion by the majority of the participants is apparent both in and outside the workshop arena. The Workshop Proceedings now contain some of the most highly cited geothermal literature. Unfortunately, the popularity of the Workshop for the presentation and exchange of ideas does have some less welcome side effects. The major one is the developing necessity for a limitation of the number of papers that are actually presented. We will continue to include all offered papers in the Summaries and Proceedings. As in the recent past, this sixth Workshop was supported by a grant from the Department of Energy. This grant is now made directly to Stanford as part of the support for the Stanford Geothermal Program (Contract No. DE-AT03-80SF11459). We are certain that all participants join us in our appreciation of this continuing support. Thanks are also due to all those individuals who helped in so many ways: The members of the program committee who had to work so hard to keep the program to a manageable size - George Frye (Aminoil USA), Paul G. Atkinson (Union Oil Company). Michael L. Sorey (U.S.G.S.), Frank G. Miller (Stanford Geothermal Program), and Roland N. Horne (Stanford Geothermal Program). The session chairmen who contributed so much to the organization and operation of the technical sessions - George Frye (Aminoil USA), Phillip H. Messer (Union Oil Company), Leland L. Mink (Department of Energy), Manuel Nathenson (U.S.G.S.), Gunnar Bodvarsson (Oregon State University), Mohindar S. Gulati (Union Oil Company), George F. Pinder (Princeton University), Paul A. Witherspoon (Lawrence Berkeley Laboratory), Frank G. Miller (Stanford Geothermal Program) and Michael J. O'Sullivan (Lawrence Berkeley Laboratory). The many people who assisted behind the scenes, making sure that everything was prepared and organized - in particular we would like to thank Jean Cook and Joanne Hartford (Petroleum Engineering Department, Stanford University) without whom there may never have been a Sixth Workshop. Henry J. Ramey, Jr. Paul Kruger Ian G. Donaldson Stanford University December 31, 1980.

The Complete Idiot's Guide to Green Careers Springer

New Scientist magazine was launched in 1956 "for all those men and women who are interested in scientific discovery, and in its industrial, commercial and social consequences". The brand's mission is no different today - for its consumers, New Scientist reports, explores and interprets the results of human endeavour set in the context of society and culture.

Petroleum Abstracts. Literature and Patents Elsevier

As nations alike struggle to diversify and secure their power portfolios, geothermal energy, the essentially limitless heat emanating from the earth itself, is being harnessed at an unprecedented rate. For the last 25 years, engineers around the world tasked with taming this raw power have used "Geothermal" "Reservoir Engineering" as both a training manual and a professional reference. This long-awaited second edition of "Geothermal Reservoir Engineering" is a practical guide to the issues and tasks geothermal engineers encounter in the course of their daily jobs. The book focuses particularly on the evaluation of potential sites and provides detailed guidance on the field management of the power plants built on them. With over 100 pages of new material informed by the breakthroughs of the last 25 years, "Geothermal Reservoir Engineering" remains the only training tool and professional reference dedicated to advising both new and experienced geothermal reservoir engineers. The only resource available to help geothermal professionals make smart choices in field site selection and reservoir managementPractical focus eschews theory and basics- getting right to the heart of the important issues encountered in the fieldUpdates include coverage of advances in EGS (enhanced geothermal systems), well stimulation, well modeling, extensive field histories and preparing data for reservoir simulationCase studies provide cautionary tales and best practices that can only be imparted by a seasoned expert"

Kenya Gazette Simon and Schuster

In order to ensure the widest and greatest utility of IT and software projects designed for geothermal reservoir engineer- ing the full consideration of end users' task and workflow needs must be evaluated. This paper describes the user-centered design (UCD) approach taken in the development of a user interface (UI) solution for the National Geothermal Data System (NGDS). This development process has been research based, highly collabora- tive, and incorporates state-of-the-art practices to ensure a quality user experience. Work is continuing on the interface, including future usability tests to further refine the interfaces as the overall system is developed.

Geothermal Reservoir Engineering Research at Stanford University. First Annual Report, October 1, 1980-September 30, 1981 Geothermal Reservoir Engineering

Comprehensive Energy Systems provides a unified source of information covering the entire spectrum of energy, one of the most significant issues humanity has to face. This comprehensive book describes traditional and novel energy systems, from single generation to multi-generation, also covering theory and applications. In addition, it also presents high-level coverage on energy policies, strategies, environmental impacts and sustainable development. No other published work covers such breadth of topics in similar depth. High-level sections include Energy Fundamentals, Energy Materials, Energy Production, Energy Conversion, and Energy Management. Offers the most comprehensive resource available on the topic of energy systems Presents an authoritative resource authored and edited by leading experts in the field Consolidates information currently scattered in publications from different research fields (engineering as well as physics, chemistry, environmental sciences and economics), thus ensuring a common standard and language

Advanced Well Control Academic Press

Advanced Well Control addresses all phases of well control, from the design stage of a well through plug and abandonment.

Emerging Workforce Trends in the U.S. Energy and Mining Industries Elsevier

Describes 250 occupations which cover approximately 107 million jobs.

Geothermal Reservoir Engineering

Reservoir definition research consisted of well test analysis and bench-scale experiments. Well testing included both single-well pressure drawdown and buildup testing, and multiple-well interference testing. The development of new well testing methods continued to receive major emphasis during the year. Work included a project on multiphase compressibility, including the thermal content of the rock. Several projects on double-porosity systems were completed, and work was done on relative-permeability. Heat extraction from rock will determine the long-term response of geothermal reservoirs to development. The work in this task area involved a combination of physical and mathematical modeling of heat extraction from fractured geothermal reservoirs. International cooperative research dealt with adsorption of water on reservoir cores, the planning of tracer surveys, and an injection and tracer test in the Los Azufres fields. 32 refs.

Journal of Petroleum Technology

Energy and mineral resources are essential for the nation's fundamental functions, its economy, and security. Nonfuel minerals are essential for the existence and operations of products that are used by people every day and are provided by various sectors of the mining industry. Energy in the United States is provided from a variety of resources including fossil fuels, and renewable and nuclear energy, all with established commercial industry bases. The United States is the largest electric power producer in the world. The overall value added to the U.S. gross domestic product (GDP) in 2011 by major industries that consumed processed nonfuel mineral materials was $2.2 trillion. Recognizing the importance of understanding the state of the energy and mining workforce in the United States to assure a trained and skilled workforce of sufficient size for the future, the Department of Energy's (DOE's) National Energy technology Laboratory (NETL) contracted with the National Research Council (NRC) to perform a study of the emerging workforce trends in the U.S. energy and mining industries. Emerging Workforce Trends in the U.S. Energy and Mining Industries: A Call to Action summarizes the findings of this study.

Geothermal Well Test Analysis

The Sixth Workshop on Geothermal Reservoir Engineering convened at Stanford University on December 16, 1980. As with previous Workshops the attendance was around 100 with a significant participation from countries other than the United States (18 attendees from 6 countries). In addition, there were a number of papers from foreign contributors not able to attend. Because of the success of all the earlier workshops there was only one format change, a new scheduling of Tuesday to Thursday rather than the earlier Wednesday through Friday. This change was in general considered for the better and will be retained for the Seventh Workshop. Papers were presented on two and a half of the three days, the panel session, this year on thenumerical modeling intercomparison study sponsored by the Department of Energy, being held on the second afternoon. This panel discussion is described in a separate Stanford Geothermal Program Report (SGP-TR42). This year there was a shift in subject of the papers. There was a reduction in the number of papers offered on pressure transients and well testing and an introduction of several new subjects. After overviews by Bob Gray of the Department of Energy and Jack Howard of Lawrence Berkeley Laboratory, we had papers on field development, geopressured systems, production engineering, well testing, modeling, reservoir physics, reservoir chemistry, and risk analysis. A total of 51 papers were contributed and are printed i n these Proceedings. It was, however, necessary to restrict the presentations and not all papers printed were presented . Although the content of the Workshop has changed over the years, the format to date has proved to be satisfactory. The objectives of the Workshop, the bringing together of researchers, engineers and managers involved in geothermal reservoir study and development and the provision of a forum for the prompt and open reporting of progress and for the exchange of ideas, continue to be met . Active discussion by the majority of the participants is apparent both in and outside the workshop arena. The Workshop Proceedings now contain some of the most highly cited geothermal literature. Unfortunately, the popularity of the Workshop for the presentation and exchange of ideas does have some less welcome side effects. The major one is the developing necessity for a limitation of the number of papers that are actually presented. We will continue to include all offered papers in the Summaries and Proceedings. As in the recent past, this sixth Workshop was supported by a grant from the Department of Energy. This grant is now made directly to Stanford as part of the support for the Stanford Geothermal Program (Contract No. DE-AT03-80SF11459). We are certain that all participants join us in our appreciation of this continuing support. Thanks are also due to all those individuals who helped in so many ways: The members of the program committee who had to work so hard to keep the program to a manageable size - George Frye (Aminoil USA), Paul G. Atkinson (Union Oil Company). Michael L. Sorey (U.S.G.S.), Frank G. Miller (Stanford Geothermal Program), and Roland N. Horne (Stanford Geothermal Program). The session chairmen who contributed so much to the organization and operation of the technical sessions - George Frye (Aminoil USA), Phillip H. Messer (Union Oil Company), Leland L. Mink (Department of Energy), Manuel Nathenson (U.S.G.S.), Gunnar Bodvarsson (Oregon State University), Mohindar S. Gulati (Union Oil Company), George F. Pinder (Princeton University), Paul A. Witherspoon (Lawrence Berkeley Laboratory), Frank G. Miller (Stanford Geothermal Program) and Michael J. O'Sullivan (Lawrence Berkeley Laboratory). The many people who assisted behind the scenes, making sure that everything was prepared and organized - in particular we would l i k e t o thank Jean Cook and Joanne Hartford (Petroleum Engineering Department, Stanford University) without whom there may never have been a Sixth Workshop. Henry J. Ramey, Jr. Paul Kruger Ian G. Donaldson Stanford University December 31, 1980.

New Scientist

Flow and Heat Transfer in Geothermal Systems: Basic Equations for Description and Modeling Geothermal Phenomena and Technologies is the ideal reference for research in geothermal systems and alternative energy sources. Written for a wide variety of users, including geologists, geophysicists, hydro-geologists, and engineers, it offers a practical framework for the application of heat and flow transport theory. Authored by two of the world's foremost geothermal systems experts, whose combined careers span more than 50 years, this text is a one-stop resource for geothermal system theory and application. It will help geoscientists and engineers navigate the wealth of new research that has emerged on the topic in recent years. Presents a practical and immediately implementable framework for understanding and applying heat and flow transport theory Features equations for modelling geothermal phenomena and technologies in full detail Provides an ideal text for applications in both geophysics and engineering

Occupational Outlook Handbook

The Reservoir Engineering Management Program being conducted at Lawrence Berkeley Laboratory includes two major tasks: 1) the continuation of support to geothermal reservoir engineering related work, started under the NSF-RANN program and transferred to

ERDA at the time of its formation; 2) the development and subsequent implementation of a broad plan for support of research in topics related to the exploitation of geothermal reservoirs. This plan is now known as the GREMP plan. Both the NSF-RANN legacies and GREMP are in direct support of the DOE/DGE mission in general and the goals of the Resource and Technology/Resource Exploitation and Assessment Branch in particular. These goals are to determine the magnitude and distribution of geothermal resources and reduce risk in their exploitation through improved understanding of generically different reservoir types. These goals are to be accomplished by: 1) the creation of a large data base about geothermal reservoirs, 2) improved tools and methods for gathering data on geothermal reservoirs, and 3) modeling of reservoirs and utilization options. The NSF legacies are more research and training oriented, and the GREMP is geared primarily to the practical development of the geothermal reservoirs. 2 tabs., 3 figs.

Status of Geothermal Reservoir Engineering Management Program ("GREMP"), December, 1979

All too often, senior reservoir managers have found that their junior staff lack an adequate understanding of reservoir management techniques and best practices needed to optimize the development of oil and gas fields. Written by an expert professional/educator, Integrated Reservoir Asset Management introduces the reader to the processes and modeling paradigms needed to develop the skills to increase reservoir output and profitability and decrease guesswork. One of the only references to recognize the technical diversity of modern reservoir management teams, Fanchi seamlessly brings together concepts and terminology, creating an interdisciplinary approach for solving everyday problems. The book starts with an overview of reservoir management, fluids, geological principles used to characterization, and two key reservoir parameters (porosity and permeability). This is followed by an uncomplicated review of multi-phase fluid flow equations, an overview of the reservoir flow modeling process and fluid displacement concepts. All exercises and case studies are based on the authors 30 years of experience and appear at the conclusion of each chapter with hints in addition of full solutions. In addition, the book will be accompanied by a website featuring supplementary case studies and modeling exercises which is supported by an author generated computer program. Straightforward methods for characterizing subsurface environments Effortlessly gain and understanding of rock-fluid interaction relationships An uncomplicated overview of both engineering and scientific processes Exercises at the end of each chapter to demonstrate correct application Modeling tools and additional exercise are included on a companion website

NGDS User Centered Design Meeting the Needs of the Geothermal Community

This project has been active for several years and has focused on developing, enhancing and applying mathematical modeling capabilities for fractured geothermal systems. The emphasis of our work has recently shifted towards enhanced geothermal systems (EGS) and hot dry rock (HDR), and FY05 is the first year that the DOE-AOP actually lists this project under Enhanced Geothermal Systems. Our overall purpose is to develop new engineering tools and a better understanding of the coupling between fluid flow, heat transfer, chemical reactions, and rock-mechanical deformation, to demonstrate new EGS technology through field applications, and to make technical information and computer programs available for field applications. The objectives of this project are to: (1) Improve fundamental understanding and engineering methods for geothermal systems, primarily focusing on EGS and HDR systems and on critical issues in geothermal systems that are difficult to produce. (2) Improve techniques for characterizing reservoir conditions and processes through new modeling and monitoring techniques based on "active" tracers and coupled processes. (3) Improve techniques for targeting injection towards specific engineering objectives, including maintaining and controlling injectivity, controlling non-condensable and corrosive gases, avoiding scale formation, and optimizing energy recovery. Seek opportunities for field testing and applying new technologies, and work with industrial partners and other research organizations.